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Working paper

INDIGENOUS MULTIPURPOSE TREES OF TANZANIA: USES AND ECONOMIC BENEFITS FOR PEOPLE

Food
and
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Working Paper

Indigenous Multipurpose Trees of Tanzania:

Uses and Economic Benefits for People

by

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and

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Food and Agriculture Organization of the United Nations

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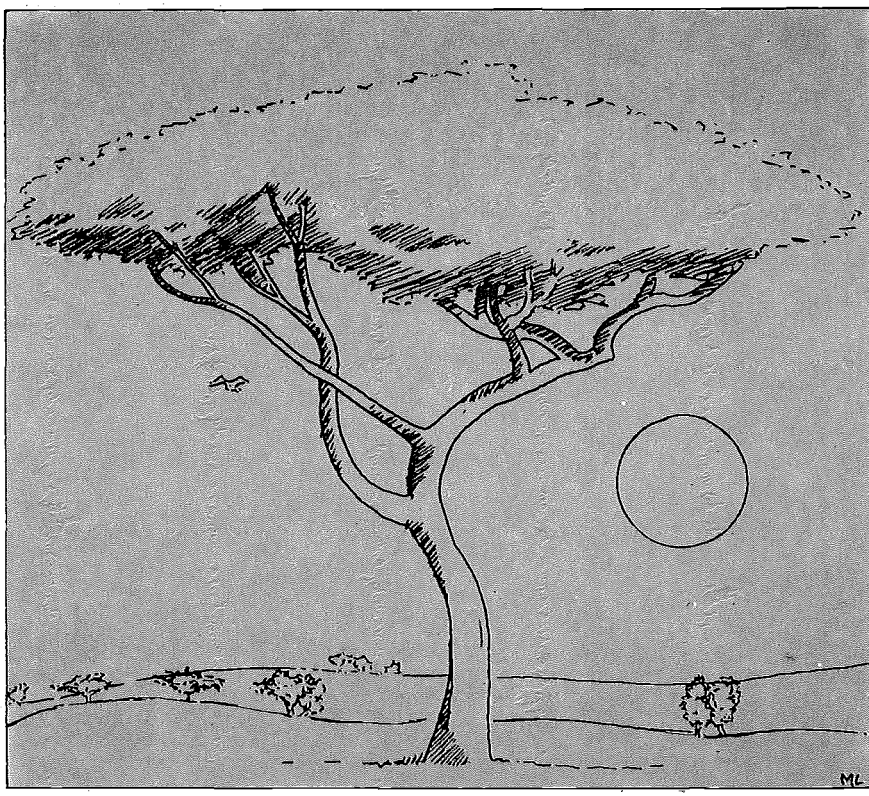

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This document is a working paper. It documents information forming part of a larger study and informs interested persons about work in progress.

It is made available in limit number for comment and discussion.

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This work was made possible by the support and efforts of numerous people and organizations. Foremost are the people of Tanzania who so readily gave their time, knowledge, and warmth. A special thanks is given to the foresters at the regional and district levels who arranged field visits, identified species, and helped with translating. A deep appreciation is also extended to Sada K. Juma of the Development Services Foundation (a Tanzanian Environmental and Developmental NGO) for her dedication to the project and her commitment to ensuring that the work was carried out in a professional manner.

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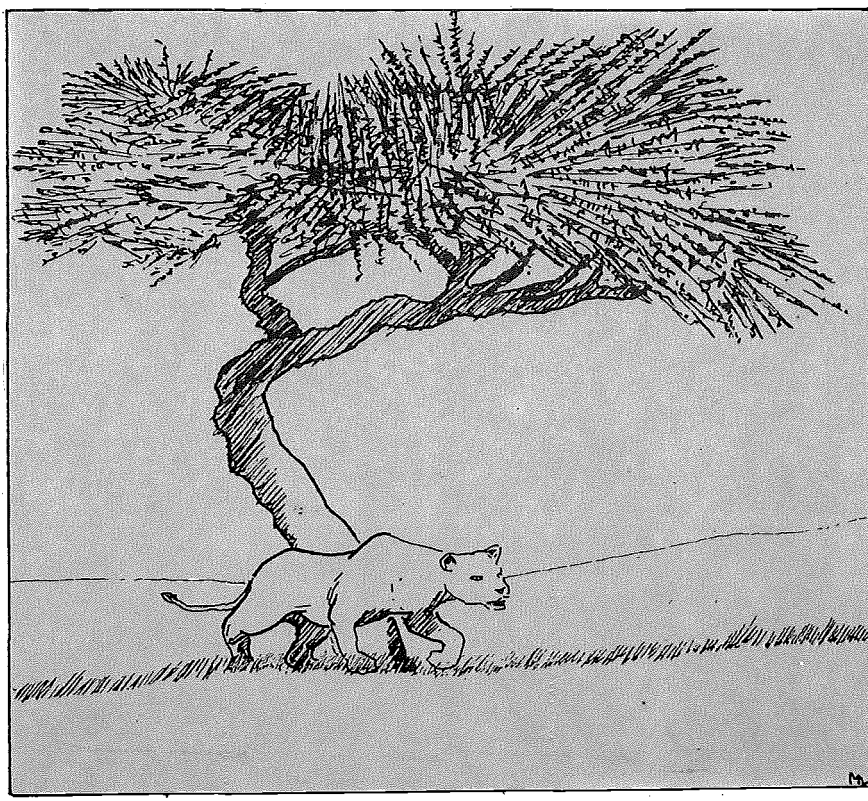
Foreword

This document was prepared under author's contract by Ms. Deborah Hines, supported by Ms. Karlyn Eckman, as one of several Regional and Country on Non-Wood Forest Products (NWFP), commissioned by FAO.

This, along with other similar and related studies, will be used for preparing a substantial publication of wider coverage on NWFP.

Comments on the document, (along with supporting materials as relevant), will be appreciated.



Glossary and Acronyms

afforestation The process of covering bare or agricultural land with trees.

agroforestry Managed use of woody perennials (trees, shrubs, bamboo, etc.) within agricultural or pastoral land use systems. In these systems both ecological and economic interactions are considered.

air dry weight The moisture content, for example of firewood after being exposed over time to local atmospheric conditions.

alluvial Soil that has been deposited by flowing water.

ambergris A waxy substance from the sperm whale used in the manufacture of perfumes.

aril An accessory covering of certain seeds.

boma A fenced-in enclosure, often a live fence, to protect a camp or a herd of livestock.

calorie A metric measure of energy which is the heat required to raise the temperature of one gram of water from 14.5 to 15.5 C at a constant pressure of one atmosphere.

CIDA Canadian International Development Agency.

coal equivalent The heat content of a fuel in terms of the equivalent heat contained in an average tonne of coal.

coppicing A method of encouraging regrowth in certain species by cutting the stem to near ground level. Often used as a method of regeneration which enables the grower to obtain 3 or 4 rotations before replanting.

dbh A measurement of tree size indicating the *diameter at breast height.*

debe One debe = approximately 20 litres or 20 kilograms.

deciduous A tree that drops its leaves seasonally or annually.

drupe A pulpy or fleshy fruit containing a single stone or pit.

economically important In this handbook refers to all benefits that come from trees, both tangible and intangible and those with market as well as non-market values. The term economically valued is used interchangeably.

ESMAP	World Bank Energy Sector Management Assistance Programme.
exotic	In this handbook exotic refers to trees that come from outside the area and are foreign to users. Generally it is a reference to trees that are not native to Tanzania. However, in some cases farmers refer to trees as exotic if they are not local to their particular area.
FAO	The Food and Agriculture Organization of the United Nations.
farm gate or forest site price	The price the farmer receives for products at the boundary of the farm or at the site in the forest, in the case of selling forest products. The price received excludes transport to market and other marketing costs. This term can sometimes be used for inputs as well.
fodder	Refers to tree parts such as leaves, flowers, or pods which are eaten by browsing or grazing animals.
henya	A red dye made from the leaves of *Lawsonia inermis*, a small shrub or tree native to Asia and the Middle East.
ICRAF	The International Council for Research in Agroforestry in Nairobi, Kenya.
IFS	International Foundation for Science.
indigenous	Growing naturally within a specific environment or within certain boundaries.
live fence	A row or hedge of live plants used to mark a boundary or prevent entry of animals or people to a certain area.
lopping	Cutting all lower branches and second-order branches – those that do not grow from the main stem, but from main branches.
MAI	A measurement of the increase in the growth of a tree giving the *mean annual increment*.
method	A way of planning, organizing, and implementing an activity or group of activities.
Miombo	An indigenous forest dominated by *Brachystegia* and *Brachylaena* species, found in Tanzania, Malawi, Mozambique, and other east and southern African countries.
mswaki stick	A product of trees such as *Salvadora persica* used as a toothbrush. Also: chew stick.

multipurpose Species that are grown to provide more than one crop, use or function. For example, a multipurpose tree can provide wood, leaves, fruits, and fodder while at the same time improving soil fertility.

NFTA Nitrogen Fixing Tree Association.

NGO Nongovernmental Organization: An organization which seeks funding, hires staff, and undertakes programmes but does not realize a profit.

nitrogen fixing A process whereby trees convert nitrogen in the atmosphere into nitrogen in the soil. Some plants have certain types of bacteria which cause nodules to form on their roots. The bacteria are able to convert atmospheric nitrogen into a form that the plant can use to build proteins.

phloem Part of the vascular system of a tree which allows sap and nutrients to descend. The *xylem* is the corresponding tissue allowing sap to rise.

pitsawing A method of cutting logs lengthwise into planks with a large hand saw in which one person stands on top of the log and another person in a pit underneath.

pollarding Cutting branches and often the top of a tree. This can be at a height which is beyond the reach of browsing animals.

pombe An alcoholic drink.

RSCU Regional Soil Conservation Unit, Nairobi, Kenya.

resin A thick sticky liquid produced by certain trees which becomes hard when exposed to air. It is used in medicines and to make varnishes and plastics.

Sahel The transitional zone of several hundred kilometres between semiarid deserts in northern Africa and the open woodland savanna to the south. It extends over 6000 kilometres from the Atlantic Ocean to the Red Sea.

scarification The process of penetrating the protective coat of dormant seeds by abrasion, nicking, soaking in hot water or acid, or as a result of passage through the digestive tracts of animals or birds, all of which stimulate germination.

shamba	Field or farming area which is often not adjacent to the home compound.
silviculture	The branch of forestry science that is concerned with the propagation and management of trees.
stratification	The process of helping to activate nutrients within immature, dormant seeds by, for example soaking in hot water, thereby stimulating germination.
tannin	A type of acid (tannic acid) found in the bark of many trees. It is commonly used for tanning leather.
TSH	Tanzania Shilling. 350 TSH = 1 U.S. dollar (1992).
ugali	Corn meal. Also called posho.
UNEP	United Nations Environmental Programme.
USDA	United States Department of Agriculture.
wildings	Young seedlings which develop naturally in the wild. They are sometimes transplanted.

1. Introduction

1.1 People's Needs and the Role of Indigenous Trees

Over the past few years increasing emphasis has been placed on promoting fast growing species that serve a variety of uses such as fuelwood, timber, and fodder in order to relieve pressure on existing forests. The concept of multipurpose trees is familiar to those working in rural development, forestry, agriculture, or environmental management. It is a term that professionals, governments, nongovernmental organizations (NGOs), and donors have used extensively, so much so that it is often synonymous with village level afforestation. The International Council for Research in Agroforestry (ICRAF) in Nairobi has identified well over 2000 multipurpose species; species which are purposely raised, preserved, or managed for more than one intended use, either for commercial purposes, household use, or for land protection/ improvement.

However, much of the emphasis on multipurpose trees has focused on species that are exotic to most of the countries where they have been promoted. In some cases this has occurred because (1) only certain exotics will grow in the harsh conditions encountered, (2) more silvicultural and propagation information exists for those species known as fast growing, and (3) in the past professionals and villagers alike tended to believe that multipurpose exotics would be better able to produce essential benefits more quickly and cost effectively.

The obvious question that comes to mind is what are the benefits that people need and prefer to obtain from the trees that they plant? An initial needs assessment of 15 villages in Ruvuma region of Tanzania revealed that no 1 product assumed priority within a family and consequently not within a village, and that indigenous trees were highly regarded because they provided multiple products. These were often products that the family regularly used but would not have had the cash required to purchase. Since farmers were planting indigenous species on their own initiative, their claims about the importance of local species to these villages were well supported.

These findings prompted the following question and consequently a more in-depth study on local people's needs and preferences for tree products:

> *Are indigenous trees well-suited to meet family needs and to provide them with forest products, thereby providing both economic and environmental benefits on a long term basis?*

Findings from the more in-depth study showed that in Tanzania, local people often prefer indigenous species for a variety of uses such as charcoal, furniture, housing material, and medicine to mention just a few. As one speaks with farmers in Dodoma, Iringa or other regions, it becomes apparent that indigenous species are valued. Some farmers are quite insistent that they prefer local trees and the proof comes when they tell you that they are mostly planting indigenous trees. Generally,

the Forest Department has not promoted the growing of these indigenous species, and so farmers, in some cases their forefathers, have developed their own propagation and management techniques.

Once indigenous trees are regarded in a broader context (as more than sources of timber, pulp, and foreign exchange), the emergence of their importance in people's day-to-day lives becomes striking. Many indigenous trees do meet local requirements better than exotic species. Traditionally, forests have formed an integral part of the household economy, providing an array of valuable products that, in many cases, the family would otherwise be forced to do without. In certain instances alternative supplies either are not locally available or are not affordable.

It is not rare for a local species to provide fuel, food, medicine, household tools, building materials, and to have social or cultural importance. An example of such a tree in Tanzania is *Dichrostachys cinerea*, locally known as *mkulajembe* in Swahili, or sickle bush. This species is highly valued, particularly in Dodoma region, as a source of material for construction, firewood, charcoal, poles, fodder, domestic items, gum, medicine, and fences. It is also nitrogen fixing, and its sharp woody thorns are used as needles.

People will continue to use indigenous species as long as they are available because these species:

- tend to be of higher quality;
- are known and respected by the users;
- are generally a common property resource;
- can be obtained without maintenance or cash payment;
- provide products that cannot be duplicated with fast growing species.

For some species the information supporting these reasons is well-known by local people and foresters alike. However, for the majority of indigenous species in Tanzania much of the information regarding these trees is held within local communities or sometimes only by certain individuals within these communities. Often a village has a special knowledge about a particular tree which is not known by the village down the road, and vice versa. This local knowledge does not become clear to others quickly or easily in many cases, and the process is further complicated by the use of local names in Tanzania. With about 120 languages, communications between foresters and local people is often a problem.

The identification of economically important species is the first step in helping to determine which indigenous species can be managed or cultivated and which other species may be substituted to produce the same end products.

Since many of these species provide tree products that are the cornerstone of a family's survival strategy, identifying alternative harvesting/managing and species selection options is an extremely important step towards slowing the deforestation of

forests and woodlands, as well as helping to assure supplies of forest products vital to local people.

1.2 Purpose of Handbook

The handbook is intended to be a concise reference on indigenous species which produce local forest products of economic importance in Tanzania. Local forest products, the term used throughout the handbook, refers to both wood and non-wood products derived from indigenous trees which have been identified as economically important by rural people. The term 'minor forest products' has not been used since within the context of the family economy the value of many of these products is not minor. Nor are the terms non-wood or non-timber forest products used, as discussions with farmers revealed that wood from indigenous trees is a product in high demand, whether for tools, domestic utensils, door frames, or timber. The handbook looks at all products that have been identified by local people, both tangible and intangible, for home use and for sale.

The handbook also includes information on propagation, management, and silviculture for selected species and detailed lists of species names in local languages. The lists are presented so that the user can identify a species if the Latin, local, or common name is known. The survey questionnaires used for more in-depth interviews are included either for reference or for use by the handbook reader.

Specifically, the handbook attempts to:

- provide a framework for assessing local tree product requirements which can be used by local groups and NGOs;
- highlight the importance of alternative and sustainable indigenous species to meet family tree product requirements in order to ease existing pressure on forests;
- provide a reference for identifying indigenous species in various local languages.

It is hoped that this handbook will be of use to local groups, NGOs, and foresters working directly with people in the field.

2. Summary of Findings

2.1 The Method

The preparation of the handbook started from the premise that people know which trees they prefer for specific uses and this preference is based on solid experience often with both indigenous and exotic species. Selecting the proper species requires matching people's preferences with appropriate silvicultural techniques and planting sites. However, this is not always easy to accomplish due to the many uncertainties associated with assessing:

- the actual needs and preferences of farmers;
- the adaptability of species to an area's climate, soils, topography, and land use conditions;
- the propagation and management requirements of preferred species, for which there is a lack of information.

Thus, a framework was developed to help identify species preferred and highly valued by women and men, and which have silvicultural potential for planting, either in agroforestry, farm forestry, or as single trees. The stages used in the formal survey process are also recommended to those undertaking forestry activities which involve people in tree planting. These stages are outlined as follows:

Stage 1 - Identify a Preliminary Species List

Steps

- Conduct preliminary survey with experts by mail.
- Conduct library searches within and outside the country.
- Review existing literature, donor projects, and research results.

Output

A preliminary list containing species which could be included in reforestation work in a particular area. The criteria used to select species for inclusion in the handbook included the following (a similar set of criteria could be developed for a particular project):

- local species which are highly valued by women and men;
- indigenous species which have a minimum of 3 products currently used by women or men;
- species whose end use has no substitute;
- indigenous species that have the potential for more intensive cultivation;
- species that are threatened or endangered, and are regularly used by women or men.

Stage 2 - Develop a Working Species List

Steps

- Discuss with researchers, seed experts, NGOs, field foresters, donors, and project managers about species that have the potential for more intensive cultivation and are valued by local people.

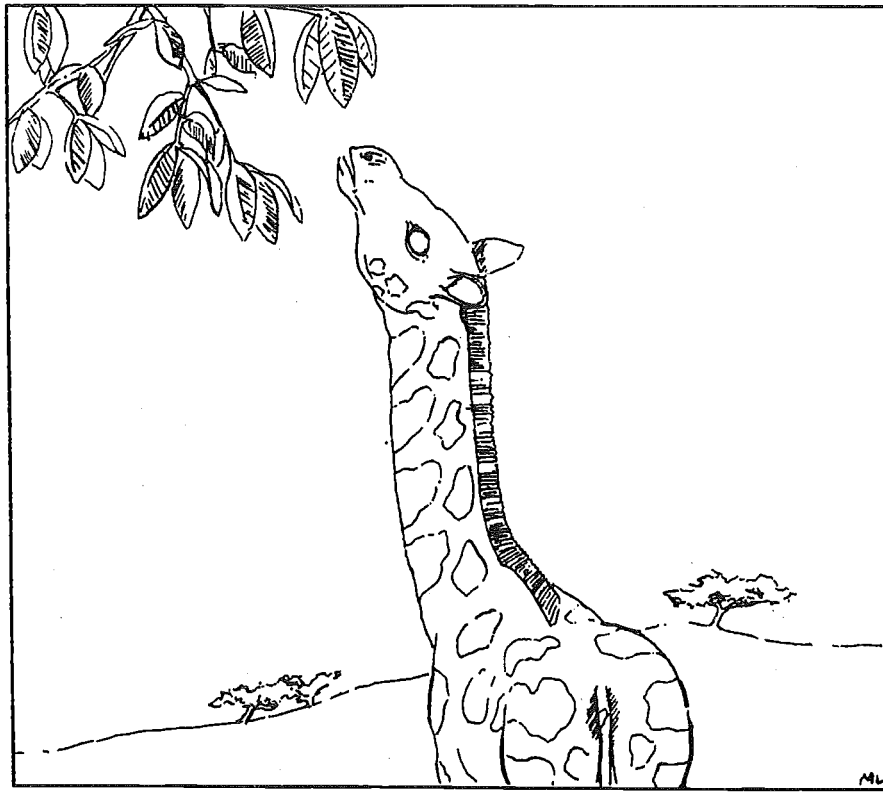
- Finalize Species Data Questionnaire 1 (questionnaires are presented in Appendix B) for use with local experts in the field based on the above discussions.

- Collect technical information using Questionnaire 1 for species identified in Stage 1, taking into consideration the following desirable characteristics (USAID 1991):

  - fast growing
  - easy to establish
  - sprout easily
  - nitrogen fixing
  - heavy foliage for fodder/mulch
  - deep root system
  - easy to propegate
  - adaptable to close spacing
  - not so quick to spread that it threatens other crops/species.

Output

A preliminary list of species with information on site requirements, propagation, silviculture, and management potential.



Stage 3 - Verify Species List in the Field

Steps

- Establish contacts with local groups.
- Modify and test questionnaire.
- Train staff to be enumerators.
- Implement surveys using a format similar to Village Level Questionnaire 2 and Market Survey.
- Verify findings through discussions with villagers, local experts, discussions with local groups, and market vendors.

Output

A list of species valued by local people with information on economic aspects, including markets, substitutes, importance to different members of the family and to the welfare of the family.

Stage 4 - Finalize Species for Planting Project/Programme

Steps

Match the preferred species identified in Stage 3 with technical aspects from Stage 2 to determine which species are best suited to:

- meeting the actual needs and preferences of farmers;
- the area's climate, soils, topography, and land use patterns;
- match propagation and management requirements with local capabilities.

Output

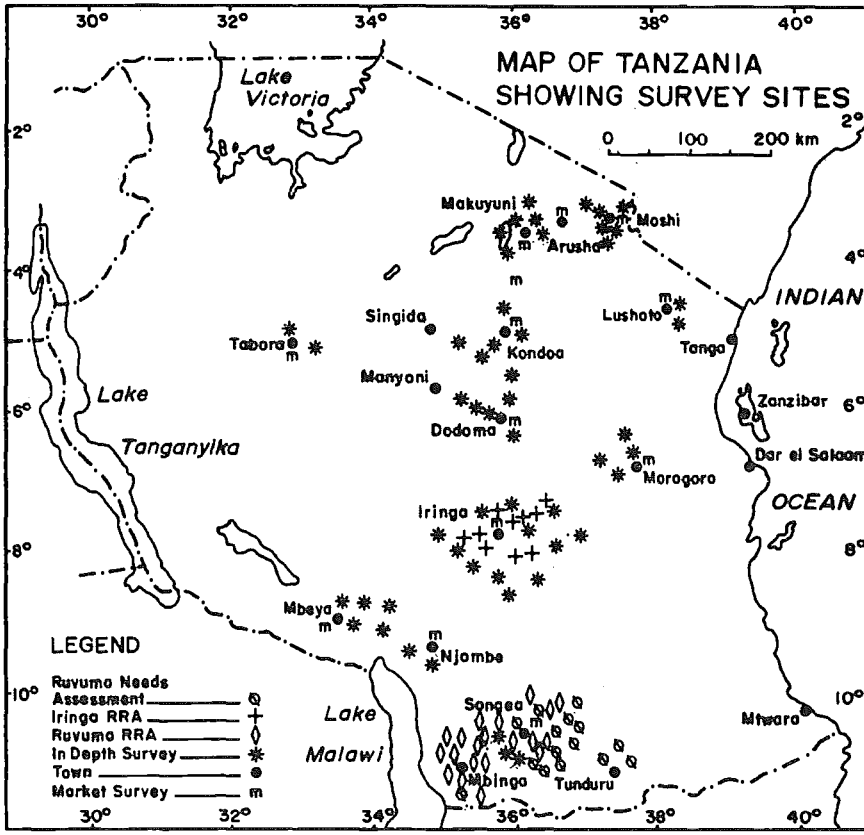
A list of potential indigenous tree species suitable for planting in specific areas, *which can be discussed with farmers* who are interested in planting trees.

Much of the information in the handbook was obtained from both formal and informal surveys which were carried out during 4 visits to Tanzania. An initial rapid rural appraisal was conducted from September to November 1989 at various sites in Songea and Mbinga districts of Ruvuma region. Two visits were made for a 2 month period during May and June (1991 and 1992) and the other was for 1 month during February (1991).

The formal in-depth survey was carried out by 4 people in 1992 and reached 53 villages and 352 respondents in the following regions: Arusha, Dodoma, Iringa, Kilimanjaro, Morogoro, Mbeya, Tabora, Tanga, and Ruvuma. This information was supplemented by an in-depth needs assessment of 15 villages in Ruvuma region in 1991 and a rapid appraisal of 8 villages in Iringa region in 1991. Refer to Map 1 for village locations and the number of people contacted at each site. Market surveys were carried out in 8 major towns, 1 in each of the above-mentioned regions and at 3 smaller weekly markets. Discussions were held with individuals, groups, foresters, NGOs, and others working in the areas of land use and reforestation.

The species included in this handbook and the resultant lists, have been identified through these survey processes and the survey data has been entered into a data base called SPECIES. SPECIES is a user friendly, menu driven programme that allows the user to input specific as well as general information regarding uses, propagation, management, distribution, and site characteristics.

These lists should not be considered exhaustive, but rather as suggestions on species which have been identified by forest product users in selected areas as being economically important and which have the potential for planting in either agroforestry, woodlots, or individual plantings. It is taken for granted that there are other species which could have been included. It is hoped that these species will be added to the data base and that this information will become available at a later date.



Map of Tanzania

TABLE 2.1
Survey Sites and Number of Respondents

1. Needs Assessment in Ruvuma Region

Village (15)	Respondents (312)
Mbinga	15
Tunduru	28
Liwumbu	25
Lihwena	14
Ndilimalitembo	23
Matogoro	24
Nandembo	19
Namwinya	26
Kilangalanga	16
Namanguli	24
Suluti	15
Rwinga	24
Mntonya	27
Namtubo	22
Maposeni	10

2. Iringa RRA Survey

Village (10)	Respondents (95)
Kilolo	4
Mazamba	15
Imagi	8
Idodi	14
Isimila	7
Dabega	11
Lugalo	8
Ilulu	10
Lulanzi	12
Mgongo	6

3. Formal Survey (53 villages, 352 Respondents)

A. Dodoma

Village (11)	Respondents (85)
Thuna	9
Lahi	8
Mpinga	9
Nzali	7
Kurio	11
Chinangalitwo	4
Kigwe	5
Ihumina	9
Patti	7
Kwamtoro	6
Kwa Dimu	10

B. Arusha

Village (6)	Respondents (58)
Gwansmehi	18
Murray	8
Moringe	14
Hayloto	4
Nainolanoka	9
Oloubi	5

C. Morogoro

Village (4)	Respondents (28)
Melela	4
Kiroua	2
Kiroka	2
?	6

D. Kilimanjaro

Village (6)	Respondents (23)
Massera	4
Kilemapolo	2
Kidia	6
Kimaroroni	4
Somahi mairni	5

E. Lushoto

Village (2)	Respondents (9)
Bogge	8
Migambo	1

F. Mbeya

Village (5)	Respondents (26)
Township	1
Kibisii	9
Wangingombe	9
Nandu	2
Tukuyu	5

G. Iringa

Village (12)	Respondents (74)
Ibulu	4
Nanbu	9
Mazombe	5
Lulanzi	16
Ismani	1
Ibumu	7
Wangingombe	2
Makuka	3
Imege	5
Irumu	4
Kittorogota	3
Makambaku	7

H. Tabora

Village (2)	Respondents (14)
Township	7
Ibiri	7

I. Ruvuma/Njombe

Village (5)	Respondents (35)
Gumbilo	5
Igawisenga	8
Myangimbole	10
Njombe	5
?	7

4. RRA Ruvuma Region Villages

Songea	Malindindo
Mfaranyaki	Kihereketi
Lilambo	Liperemba
Matete	Amanamokolo
Tanga	Mukeko
Lumecha	Lipumba
Matetereke	Namepola
Lilondo	Mhekela
Lugazo	Lilombo
Kiherekete	Mbinga

2.2 General Conclusions

Given the complexity of village level political, labour, land, resource tenure, and gender relationships, needs assessments independent of the formal survey were carried out in Ruvuma and Iringa regions. The main purpose was to try to understand how people used forest resources and what approaches might be appropriate for village level tree planting activities. The result of these assessments is a broad range of tree uses and participatory tree planting options; options that are unique for each village surveyed, depending on the different interests, preferences, constraints, and needs of a cross-section of women and men in a particular village.

Some of the general conclusions that were derived from group interviews, village wide discussions, talks with individuals, discussions with village governments, and formal village meetings include:

- the perception of village and family problems, uses for trees, and planting preferences (including species, types of plantings, nursery organization, labour arrangements, etc.) varied considerably between men and women and at times men tried to influence women's responses so that they corresponded with their own;

- overall at the village level, men showed greater interest in tree planting activities, while women were less confident that tree planting would actually benefit them. The reasons for women's hesitation varied, but included: women generally are not involved in village level government decision making; the failure of past development projects; men take more than 1 wife, and a high divorce rate in some villages, resulting in women losing access to joint property including planted trees;

- a majority of men indicated a preference for planting as individuals. Slightly more women favoured planting as part of a group;

- in most villages forest-related problems were not included in the top 3 most serious problems either at the village level or for a particular family;

- in most villages the governments were rather weak and there had been few successful development activities;

- in general people were sceptical of the Forest Department's ability to assist them in tree planting activities. Most villagers had not been in contact with a forest extension officer;

- in all villages visited there was at least 1 person considered to be an expert on local trees, and in 8 out of 10 villages surveyed in Songea district of Ruvuma region, indigenous trees had been planted without the assistance of the Forest Department.

2.3 Role and Importance of Forests

Major findings from the different surveys undertaken indicate that the level of dependence on forests, woodlands, and bush areas and the uses for indigenous trees varies considerably from region to region, district to district, sometimes even from village to village. In certain areas there is a diverse range of ways that people exploit forests for: fuelwood, fodder, medicine, fruit, building materials, honey, household items, land improvement, and rituals. In other areas, the reliance on the forest, the retention of important trees, and the planting of indigenous species is less significant. However, in general, people in Tanzania still rely heavily on surrounding forests for both subsistence needs and as a source of income. In many areas people would have difficulty surviving if they had to depend only on cultivated land for food, fuel, and cash income.

Almost all fuelwood is collected or produced on non-cultivated lands. A substantial part of household income is derived from products grown on these lands and some food, though more difficult to assess, is harvested from non-cultivated lands. Most rural people still depend on forests and bushlands for both economic and food security, and in many cases this dependence is increasing with improved living standards and increasing population.

It is also evident that the role and importance of forests have changed and will continue to change as do socioeconomic conditions within Tanzania.

Some factors that influence consumption of indigenous tree products include (1) the type of forest cover and the percentage of cover remaining, (2) the accessibility of treed areas both in terms of distance from the village and entry restrictions, (3) the degree to which exotics have been introduced and accepted, (4) disposable income and the availability of substitute products, and (5) the traditional importance of trees within a Tribe.

> The importance of trees and forests in protecting the environment and in positively affecting farming is firmly established in the minds of farmers.

In every village visited, some farmers mentioned the need to plant and protect trees in order to stem environmental deterioration and halt the decline in agricultural production. It seemed to be generally recognized that trees and forests improve the productivity of cultivated fields. The strongest preference to emerge from the survey was that both men and women generally tend to consider wood uses of trees most important (firewood, building materials, domestic items).

Other findings include:

- even though there is widespread promotion and planting of exotics, people retain certain indigenous trees in the fields and have a strong preference for exploiting indigenous species for specific uses;

- in all villages visited, except Masai villages, people had planted trees, and many had planted indigenous species;

- a reason often given for planting trees was that farmers were experiencing an increasing shortage of local trees and there are few or no alternatives for their products;

- both production and protection were mentioned as major reasons for planting trees, although the protective and productive functions varied according to topography, and other conditions of the area;

- trees tend to have very specific uses. All potential uses are not realized in an area, and a common use in a village may not be practised in the adjacent village;

- in drier areas or in areas where there is increasing scarcity of indigenous trees, multiple uses for a particular species are more common;

- many forest fruits are valued as food for children and are collected by children while in the woods. In many cases adults eat these fruits when carrying out other activities in the forest;

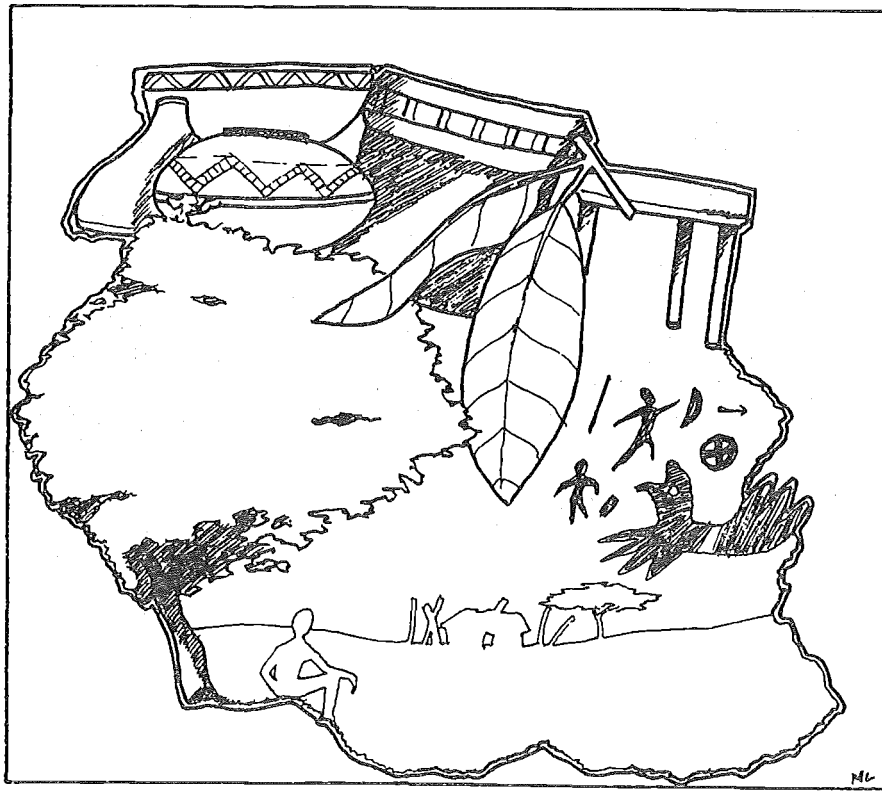
- where exotic fruits such as mango, papaya, and banana have been planted, little use is made of forest fruits. Likewise, where a large number of indigenous trees have been retained or planted, the variety of exotics is small;

- farmers use various propagation techniques for indigenous species: cuttings, transplanting wildlings, directly sowing untreated seeds, and seed treatment. They also undertake management activities including protection, weeding, pollarding, and coppicing, depending on the species and the end product desired.

2.4 Additional Thoughts

These findings suggest that future forestry efforts need to focus on managing and developing locally important forest products, fully involving local people, both men and women, and incorporating their knowledge in this process. As many farmers are demonstrating, a variety of useful indigenous trees can be propagated by stumps, cuttings, direct sowing, and transplanting wildlings. These types of propagation techniques generally require timing adapted to specific sites and species, and this information often rests with the elders in a village. A large percentage of the most successful agroforestry trees used in Africa are indigenous and the probability of finding an appropriate indigenous agroforestry tree is much greater than finding a suitable exotic (Johansson 1992).

Finally, the indigenous trees of Tanzania represent a valuable genetic resource that needs to be cared for by the people relying on them. To date little has been done to research and promote the propagation, management, and local exploitation of these trees. It is time that local foresters, extension agents, NGOs, and farmers work together to study management and propagation techniques and work for the long term and sustainable use of indigenous trees in Tanzania.



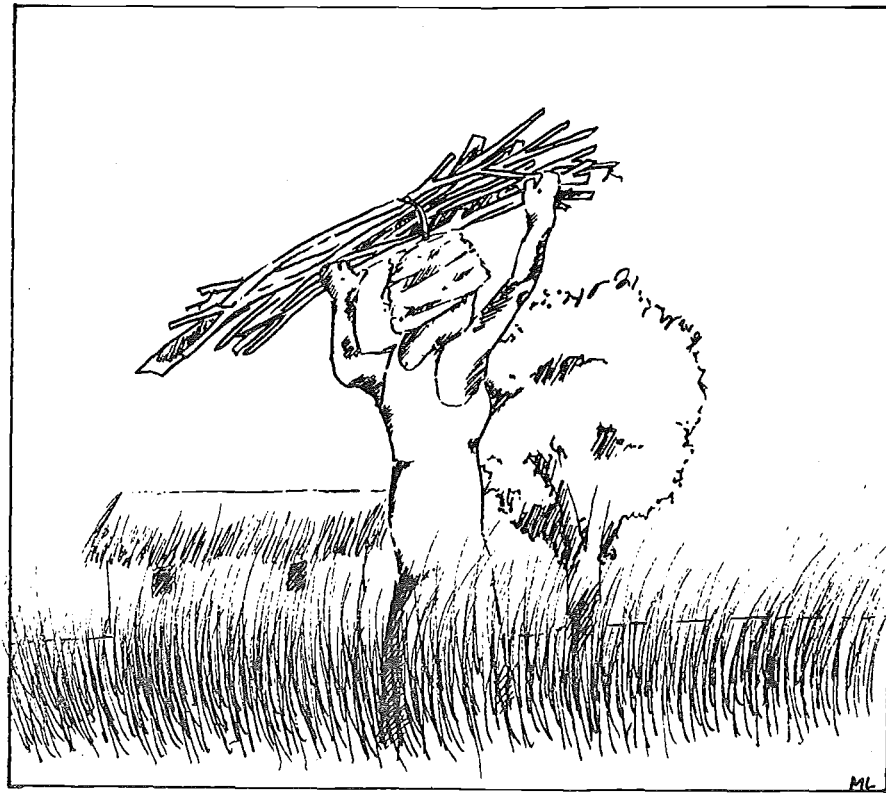
3. Specific Tree Uses

3.1 Firewood

Shoka lisilo mpini halichanji kuni
An axe with no handle does not split firewood
(Swahili sayings are taken from Farsi 1958.)

In Tanzania firewood is the main source of energy for rural households, and is an important source of cooking fuel in towns. In rural areas many people rely solely on firewood for cooking and other household tasks. It is generally the preferred fuel for cooking *ugali* and heating water. In urban areas people rely less on firewood and tend to use more charcoal. It should be highlighted however, that most urban households use more than 1 type of fuel. For example in Iringa, approximately 55 % of the population use charcoal for cooking, 33 % use wood, with the remainder using kerosene and electricity (Hines 1991).

The main home based income generating activity requiring wood is the brewing of local maize and millet beer (*pombe*). Brewing is done by women and *pombe* is sold to middle women who then retail it to beer stalls or licensed beer halls. It is not



customary (or legal) to sell *pombe* from private households. On average, 54 kilograms of firewood, in log form, is used to make 160 litres (an oil drum) of beer.

Wood is also the predominant source of energy for some small-scale processing enterprises such as brick making, tobacco curing and fish smoking. Firewood demand for tobacco curing has been identified as one of the principle causes of deforestation and depletion of the natural woodlands in Iringa, Shinyanga, Tabora regions and parts of Ruvuma region. In Iringa, it was estimated that approximately 15 kilograms of stacked wood is needed to produce 1 kilogram of cured tobacco whereas brick burning (50000 bricks) requires about 20 tonnes of firewood.

Bakeries and institutions rely primarily on wood as well, and can consume substantial quantities. A Teachers Training College in Iringa with 1140 persons, operating 10 months out of the year requires approximately 240 tonnes of wood annually, or about 0.8 tonnes per capita per year. However on a per capita basis, institutional firewood requirements tend to be less than consumption in either urban or rural households.

Species grown for fuelwood for use as either firewood or charcoal should:

* grow quickly, yield a high volume of wood quickly, and require minimum management time;
* coppice or sprout well from shoots;
* have dense wood with a low moisture content;
* produce little and nontoxic smoke;
* produce wood that splits easily and can easily be transported;
* produce wood without thorns;
* yield other products or services that are demanded by the household;
* produce wood that does not spit or spark when burning.

Adapted from USAID, Growing Multipurpose Trees on Small Farms.

A Household Energy Consumption/Cooking Habits survey conducted in January 1987 found the per capita fuelwood consumption in Dar es Salaam to be 2.1 cubic metres solid wood (ESMAP, World Bank 1988). Consumption for other urban areas was estimated to be slightly lower due to higher fuel costs, lower median incomes, and poorer supply networks. Consumption estimates derived for Iringa Town found that about 1.73 cubic metres of solid wood was consumed per capita per year. This figure is an aggregation of both wood and charcoal (Hines 1991). For rural areas visited the annual per person consumption of fuelwood was about 1.1 cubic metres.

In most villages firewood is neither bought nor sold, but collected for home use. Where firewood is marketed, the average price is about 10 TSH per kilogram (1991-92). Firewood sold in large quantities, for example a 7 tonne truck load, costs about 750 TSH per cubic metre (1991-92).

TABLE 3.1
Preferred Firewood Species

Species mentioned frequently as important for firewood include *Uapaca kirkiana, Dichrostachys cinerea, Brachystegia spiciformis.*

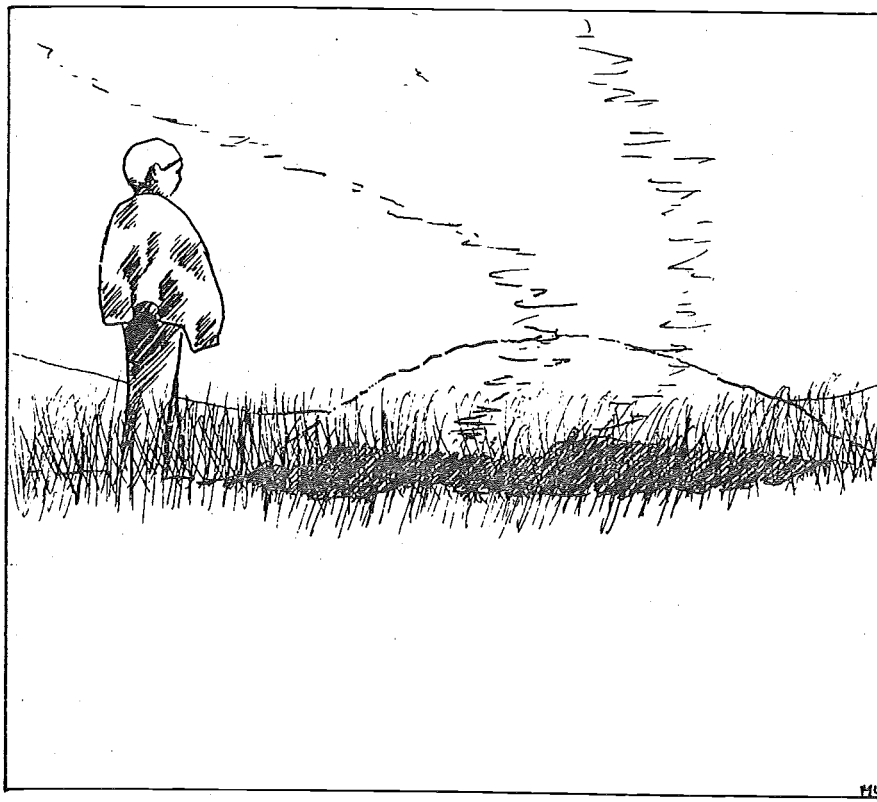
ACACIA ALBIDA (F. ALBIDA)
ACACIA GERRARDII
ACACIA LAHAI
ACACIA MELLIFERA
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA SIEBERANA
ACACIA TORTILIS
ACACIA XANTHOPHLOEA
AFZELIA QUANZENSIS
ALBIZIA GUMMIFERA
ALBIZIA HARVEYI
ALBIZIA PETERSIANA
ALBIZIA SCHIMPERANA
ALBIZIA VERSICOLOR
ANNONA SENEGALENSIS
BALANITES AEGYPTIACA
BOSCIA MOSSAMBICENSIS
BRACHYSTEGIA BOEHMII
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS
BREONADIA SALICINA
BRIDELIA MICRANTHA
BURKEA AFRICANA
COMBRETUM ADENOGONIUM
COMBRETUM ZEYHERI
COMMIPHORA AFRICANA
COMMIPHORA EMINII
CORDIA AFRICANA
CORDIA SINENSIS
CROTON MACROSTACHYUS
CROTON MEGALOCARPUS
DALBERGIA ARBUTIFOLIA
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA
DIOSPYROS KIRKII
DIOSPYROS MESPILIFORMIS
ENTADA ABYSSINICA
ERYTHRINA ABYSSINICA
EUCLEA DIVINORUM
FAUREA SALIGNA
FICUS SYCOMORUS
FICUS VALLIS-CHOUDAE
FLACOURTIA INDICA
GREWIA BICOLOR
GREWIA PLATYCLADA
HAGENIA ABYSSINICA
ILEX MITIS
JULBERNARDIA GLOBIFLORA
KHAYA ANTHOTHECA
KIGELIA AFRICANA
LONCHOCARPUS CAPASSA
MARKHAMIA OBTUSIFOLIA
MARKHAMIA ZANZIBARICA
OCOTEA USAMBARENSIS
OLEA CAPENSIS
OLEA EUROPAEA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS
PODOCARPUS LATIFOLIUS
PRUNUS AFRICANA
PTEROCARPUS ANGOLENSIS
RAUVOLFIA CAFFRA
RHUS NATALENSIS
SALVADORA PERSICA
STRYCHNOS INNOCUA
SYZYGIUM CORDATUM
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
TECLEA NOBILIS
TERMINALIA SERICEA
TREMA ORIENTALIS
TRICHILIA EMETICA
UAPACA KIRKIANA
VANGUERIA INFAUSTA
VANGUERIA MADAGASCARIENSIS
VITEX DONIANA
VITEX PAYOS
WARBURGIA SALUTARIS
XERODERRIS STUHLMANNII
XIMENIA AMERICANA
XIMENIA CAFFRA

3.2 Charcoal

Kinga na kinga ndipo moto uwakapo
One firebrand after another keeps the fire burning

In urban areas charcoal is used extensively for household cooking tasks, and it is relied on almost exclusively by restaurants. Charcoal is generally preferred for cooking meat, fish, beans, and other foods for the evening meal such as rice and fried bananas. However, the price of charcoal often limits its use. Nevertheless, when looking at comparative cooking costs on a kilocalorie basis in Tanzania, electricity, then charcoal, and then firewood are the least cost cooking options, if the cost and the availability of stoves for the respective fuel is not considered (Hines 1991).

Small scale charcoal production is a significant source of income for many small farmers, predominately men, as well as a significant cause of deforestation, notably the Miombo woodlands. Farmers construct earth kilns by covering stacked wood with vegetation and then with soil, a technique commonly referred to as 'mudding'. These small kilns are wedge shaped and use about 5 to 6 cubic metres of wood to produce about 12, 35 kilogram bags of charcoal. The recovery efficiency is about 15% (ESMAP, World Bank 1988).



In many areas of Tanzania farmers who were once involved in charcoal making have been forced to look for alternative sources of income, because of over-exploitation of the woodlands and a lack of raw material. In Mazombe, a village visited in the Iringa region, about 150 charcoal workers had produced between 45000 to 50000 bags in 1987. In 1991 it was estimated that about 22,500 bags were produced in the same village, amounting to a substantial reduction over the 4 year period (Hines 1991).

Generally speaking, these local producers earn between 150 and 300 TSH per 35 kilogram bag whereas the retail price, depending on the size of the urban area, is usually between 600 and 850 TSH. In urban areas 1 kilogram usually sells for about 20 TSH (1991-92). These price variations reflect the highly competitive nature of the charcoal market, differences in economies of scale, and the degree of integration between different selling levels. Price also depends on the quality of the charcoal, including species and amount of fine material, the transport method (truck, tractor, bicycle, wheelbarrow, donkey, or headloading), the distance travelled, and whether the operation is legal.

TABLE 3.2
Preferred Charcoal Species

Local species frequently mentioned for charcoal production include: *Brachystegia spiciformis, Combretum molle,* and *Dichrostachys cinerea.*

ACACIA ALBIDA (F. ALBIDA)
ACACIA LAHAI
ACACIA NILOTICA
ACACIA TORTILIS
AFZELIA QUANZENSIS
ALBIZIA HARVEYI
ALBIZIA SCHIMPERANA
ALBIZIA VERSICOLOR
BRACHYSTEGIA BOEHMII
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS
BRIDELIA MICRANTHA
BURKEA AFRICANA
COMBRETUM ADENOGONIUM
COMBRETUM MOLLE
DALBERGIA ARBUTIFOLIA
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA
DIOSPYROS MESPILIFORMIS
FAUREA SALIGNA
JULBERNARDIA GLOBIFLORA
LONCHOCARPUS CAPASSA
OLEA CAPENSIS
OLEA EUROPAEA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS
PRUNUS AFRICANA
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
TECLEA NOBILIS
TERMINALIA SERICEA
TREMA ORIENTALIS
UAPACA KIRKIANA
VITEX DONIANA

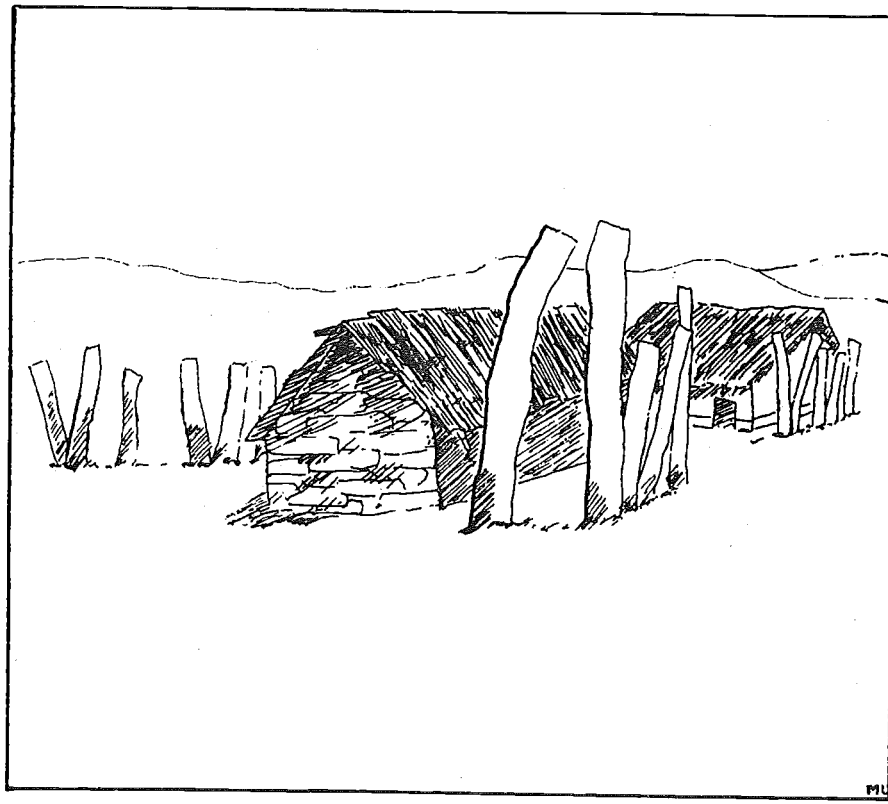
3.3 Building Materials

Kwenye miti hakuna wajenzi

Where there are trees there are no builders

In most rural areas of Tanzania forests are still the main sources of supply materials for constructing houses, fences, and *bomas*. Even though house construction styles are slightly different in various regions of the country, and they are changing in some areas, the majority of rural people still rely on local forests for their house construction needs. Almost all men responding to the question concerning their most important uses for trees indicated building materials. For women it is also a significant use.

Generally, men collect building materials from the forest when necessary and are responsible for constructing and maintaining structures. However it was found that in Ruvuma region women are also involved in house building. It was reported in some villages in Dodoma that women had to buy building materials from men if they required them, as they do not go into the forest to collect materials. Typically, rural households do not buy building materials for their own use. There is some selling of building materials but this is generally not within the village but to traders who take the materials to town.



The preferred species tend to vary according to availability and the specific use within the construction scheme. As well, the quantities required and the replacement period varies depending on the style of house and species used. A *boma* made of cedar might use 0.21 to 0.33 cubic metres of wood, whereas it is much more difficult to estimate the quantity required for a house. A typical house in Dodoma may take 4 types of building materials: supports, beams, pallets, and withers.

TABLE 3.3
Building Materials in a Typical Dodoma House

Type of Material	Quantity	Price: TSH - 1992	Replacement
supports	60	600-1000/pole	3-4/year
beams	25	800-1000/piece	-
pallets	-	50/piece	20/year
withers	1300	60/load of 25	all every 3 years

The high demand for building materials puts considerable pressure on natural forests, especially those near villages and towns. Poles can be removed from forest reserves for personal use without a license and free of charge. Given the high demand and the value many people put on indigenous species for building, it is important to try planting these preferred indigenous species outside the forest reserves to relieve pressure on existing forests.

Trees grown for poles should:

* have a single, straight stem with few branches;
* be self-pruning and have few knots;
* produce wood that is durable, light, resistant to insects, and able to support heavy cross loads;
* be able to absorb preservatives easily;
* have other uses.

TABLE 3.4
Preferred Building Material Species

Some of the highly preferred species identified for building materials include: *Acacia mellifera, Dichrostachys cinerea, Bridelia micrantha, Dalbergia arbutifolia, Prunus africana,* and *Olea capensis.*

ACACIA ABYSSINICA
ACACIA DREPANOLOBIUM
ACACIA GERRARDII
ACACIA LAHAI
ACACIA MELLIFERA
ACACIA NILOTICA
ACACIA SIEBERANA
ACACIA XANTHOPHLOEA
AFZELIA QUANZENSIS
ALBIZIA GUMMIFERA
ALBIZIA HARVEYI
ALBIZIA PETERSIANA
ALBIZIA SCHIMPERANA
AZANZA GARCKEANA
BALANITES AEGYPTIACA
BERCHEMIA DISCOLOR
BOSCIA MOSSAMBICENSIS
BREONADIA SALICINA
BRIDELIA MICRANTHA
BURKEA AFRICANA
CASSIPOUREA MALOSANA
COMBRETUM ADENOGONIUM
COMBRETUM MOLLE
COMBRETUM ZEYHERI
COMMIPHORA AFRICANA
COMMIPHORA EMINII
COMMIPHORA UGOGOENSIS
CORDIA AFRICANA
CORDIA SINENSIS
CROTON MACROSTACHYUS
CROTON MEGALOCARPUS
DALBERGIA ARBUTIFOLIA
DALBERGIA MELANOXYLON
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA
DIOSPYROS MESPILIFORMIS
ERYTHRINA ABYSSINICA
EUCLEA DIVINORUM
GREWIA BICOLOR
GREWIA PLATYCLADA
HAGENIA ABYSSINICA
ILEX MITIS
JUNIPERUS PROCERA
KHAYA ANTHOTHECA
LONCHOCARPUS CAPASSA
MARKHAMIA OBTUSIFOLIA
MARKHAMIA ZANZIBARICA
MILICIA EXCELSA
OCOTEA USAMBARENSIS
OLEA CAPENSIS
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
PODOCARPUS LATIFOLIUS
PRUNUS AFRICANA
PTEROCARPUS ANGOLENSIS
RAUVOLFIA CAFFRA
STROPHANTHUS EMINII
STRYCHNOS COCCULOIDES
STRYCHNOS INNOCUA
SYZYGIUM CORDATUM
SYZYGIUM GUINEENSE
TECLEA NOBILIS
TERMINALIA SERICEA
TREMA ORIENTALIS
TRICHILIA EMETICA
UAPACA KIRKIANA
VANGUERIA INFAUSTA
VANGUERIA MADAGASCARIENSIS
VITEX DONIANA
VITEX PAYOS
XIMENIA CAFFRA

3.4 Domestic Items

Mshare kwenda msituni haukupotea
If an arrow goes into the forest it is not lost.
It is after all where it originated.

Raw materials from the forest are used to make a wide range of products that can broadly be classified as household utensils, tools, and equipment. Many different species are used to make tools and utensils that meet day to day household needs. While substitutes for many items are available in larger towns, in most villages people still rely almost exclusively on materials from forests and woodlands for domestic items.

Most items are made by village specialists. There tend to be specialists in each village and they are generally men. These people often inherit their crafts and tend to specialize in producing a specific set of items. However, simple items such as spoons are sometimes made within the household.

A typical village family would likely own the following items, all of which, except the pestle and mortar, may need to be replaced annually:

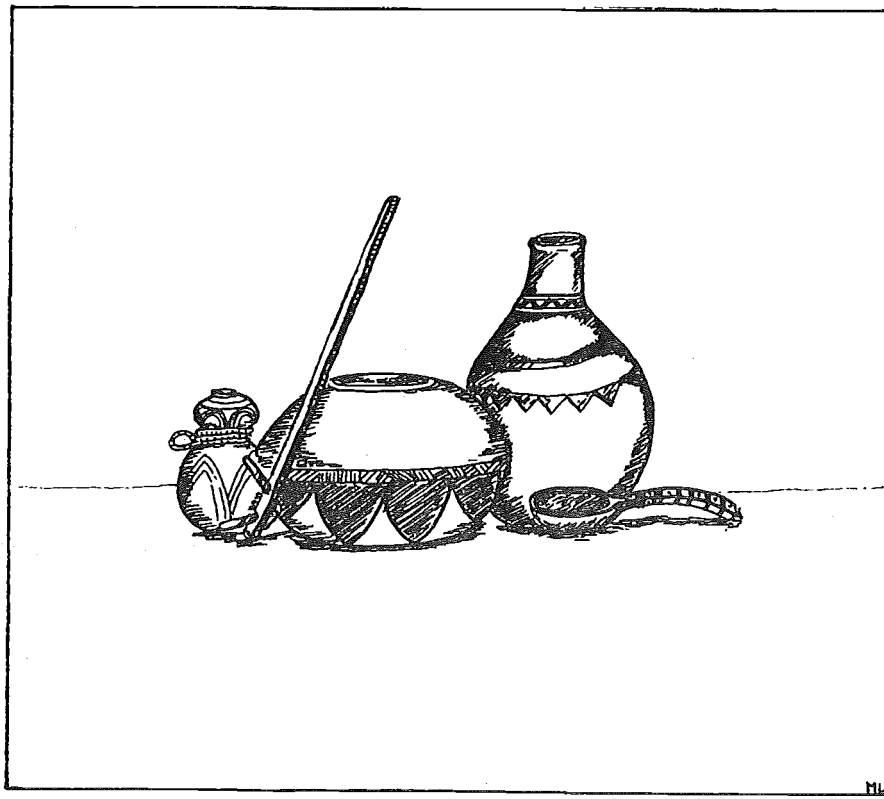
TABLE 3.5
Domestic Items Likely Owned by a Typical Village Family

Item	Quantity	Purchase Price TSH/unit - 1992
stirring sticks	2	100
pestle	1	800
mortar	1	100-200
rolling pin	1	50
spoon	5-10	5
axe handle	1	100
hoe handle	5	100
spade handle	1	100
bow	1	150
arrow	10	50
spear	2	150

Market prices for similar items in large towns such as Morogoro, Dodoma, Iringa, Songea, Arusha, Mbeya, and Moshi are:

TABLE 3.6
Market Prices for Domestic Items

Item	Wholesale Price TSH/unit - 1992	Retail Price TSH/unit - 1992
stirring sticks	-	100
pestle (large)	800-1000	1500
mortar	150	250
rolling pin	200-300	450
spoon	25-40	50-100
sieve	150-250	300-350
knife	200-250	300-450
axe handle	-	1200
hoe handle	100	200
spade handle	-	700
bow	500	800
spear	500	800-1000
walking stick	60	80



Species for making domestic items should:

* possess straight stems and provide either light or heavy, strong wood;
* work or carve easily;
* peel easily and be free of knots;
* withstand pests and diseases;
* have low permeability for items such as spoons and cups;
* have other uses.

TABLE 3.7
Preferred Species for Domestic Items

Highly preferred species for domestic uses include: *Rauvolfia caffra, Albizia harveyi, Teclea nobilis, Grewia bicolor,* and *Cordia sinensis*

ACACIA ALBIDA (F. ALBIDA)
ACACIA LAHAI
ACACIA MELLIFERA
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA SIEBERANA
ACACIA TORTILIS
ADANSONIA DIGITATA
ALBIZIA GUMMIFERA
ALBIZIA HARVEYI
ALBIZIA PETERSIANA
ALBIZIA SCHIMPERANA
ALBIZIA VERSICOLOR
ANNONA SENEGALENSIS
AZANZA GARCKEANA
BALANITES AEGYPTIACA
BERCHEMIA DISCOLOR
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS
BREONADIA SALICINA
BRIDELIA MICRANTHA
BURKEA AFRICANA
CASSIPOUREA MALOSANA
COMBRETUM MOLLE
COMMIPHORA AFRICANA
COMMIPHORA MOLLIS
COMMIPHORA TROTHAE
COMMIPHORA UGOGOENSIS
CORDIA AFRICANA
CORDIA SINENSIS
CROTON MACROSTACHYUS
DALBERGIA ARBUTIFOLIA
DALBERGIA MELANOXYLON
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA
DIOSPYROS KIRKII
DIOSPYROS MESPILIFORMIS
ENTADA ABYSSINICA
ERYTHRINA ABYSSINICA
FAUREA SALIGNA
FLACOURTIA INDICA
GREWIA BICOLOR
KIGELIA AFRICANA
LONCHOCARPUS CAPASSA
MARKHAMIA OBTUSIFOLIA
MARKHAMIA ZANZIBARICA
OLEA CAPENSIS
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS
PRUNUS AFRICANA
PTEROCARPUS ANGOLENSIS
RAUVOLFIA CAFFRA
STROPHANTHUS EMINII
STRYCHNOS COCCULOIDES
STRYCHNOS INNOCUA
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
TECLEA NOBILIS
TERMINALIA SERICEA
UAPACA KIRKIANA
XERODERRIS STUHLMANNII
XIMENIA AMERICANA
XIMENIA CAFFRA

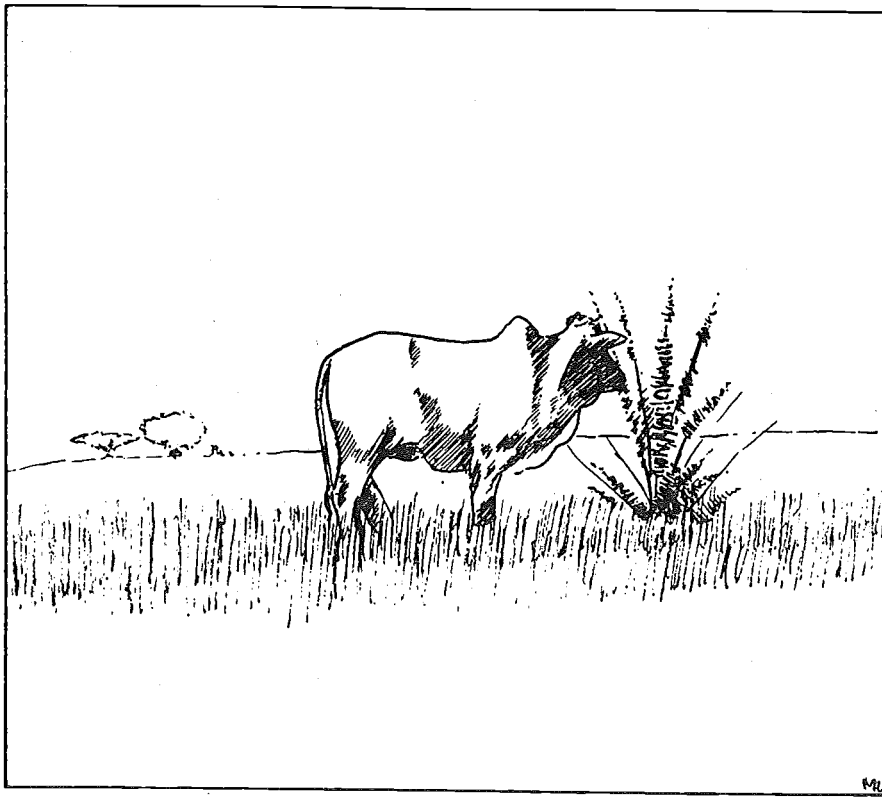
3.5 Fodder

Mwenye skoku hakosi kuni
He who has an axe does not lack for firewood or fodder

Livestock raising is an integral part of most household production systems in Tanzania. Herds are generally considered to be a source of security for future and unexpected needs, though animals are occasionally slaughtered for home consumption.

Trees from forests, woodlands, farms, and fallow land are primary sources of fodder and are instrumental in supporting the livestock population of Tanzania. Animals are generally free grazing, though increasingly villages are introducing zero grazing laws requiring tethering and cut-and-carry systems. It was noticed that in many areas free grazing still inhibits tree planting, even in agroforestry systems. In some areas, for example Babati district of Arusha, the adoption of zero grazing on a large scale is unlikely for the foreseeable future due to the uncertainty of fodder crop production, the length of the dry season, and the availability and cost of labour (Johansson 1992).

In drier areas, particularly Dodoma region and the Southern Highlands, fodder was not generally identified as one of the most important uses of trees, either by men or women. Most farmers said they never bought feed; they only collected fodder for



sick or newborn animals. Free grazing was used almost exclusively by those interviewed in these areas.

In some districts the demand for fodder is so high that farmers have started to grow fodder grass for supplementary dry grass. On the slopes of Mt. Kilimanjaro indigenous tree species have either been retained or planted for the specific purpose of supplying fodder. Of the farmers interviewed there, all mentioned the importance of trees for supplying fodder. However none sold leaf fodder, although occasionally they had to purchase it in the lower lying areas. One farmer estimated that he produced 75% of the fodder required to feed his 4 goats and 2 cows. However, he still purchased from outside the village 4, 7 tonne loads of feed costing about 60000 TSH (1992) for the 28 tonnes.

Trees grown for fodder should:

* produce leaves or pods that animals like to eat and have high nutritional content;
* withstand lopping, pruning, and coppicing;
* grow quickly, especially in the early growth stages;
* withstand pests, diseases and browsing animals;
* have other uses.

TABLE 3.8
Preferred Fodder Species

Some highly preferred species for fodder production include: *Acacia albida, Vitex payos, Ficus spp.,* and *Croton macrostachyus.*

ACACIA ALBIDA (F. ALBIDA)
ACACIA MELLIFERA
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA SIEBERANA
ACACIA TORTILIS
ACACIA XANTHOPHLOEA
AFZELIA QUANZENSIS
ALBIZIA GUMMIFERA
ALBIZIA PETERSIANA
ANNONA SENEGALENSIS
AZANZA GARCKEANA
BALANITES AEGYPTIACA
BERCHEMIA DISCOLOR
BRACHYSTEGIA SPICIFORMIS
BURKEA AFRICANA
COMBRETUM MOLLE
COMMIPHORA AFRICANA
COMMIPHORA EMINII
CORDIA SINENSIS
CROTON MACROSTACHYUS
CROTON MEGALOCARPUS
DALBERGIA MELANOXYLON
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA
ENTADA ABYSSINICA
FICUS SYCOMORUS
FICUS THONNINGII
FLACOURTIA INDICA
GREWIA BICOLOR
GREWIA PLATYCLADA
LANNEA SCHWEINFURTHII
LONCHOCARPUS CAPASSA
MARKHAMIA OBTUSIFOLIA
OLEA CAPENSIS
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PTEROCARPUS ANGOLENSIS
SALVADORA PERSICA
STRYCHNOS COCCULOIDES
SYZYGIUM GUINEENSE
TERMINALIA SERICEA
TREMA ORIENTALIS
TRICHILIA EMETICA
VITEX DONIANA
VITEX PAYOS
WARBURGIA SALUTARIS
XERODERRIS STUHLMANNII
XIMENIA AMERICANA

3.6 Timber/Furniture

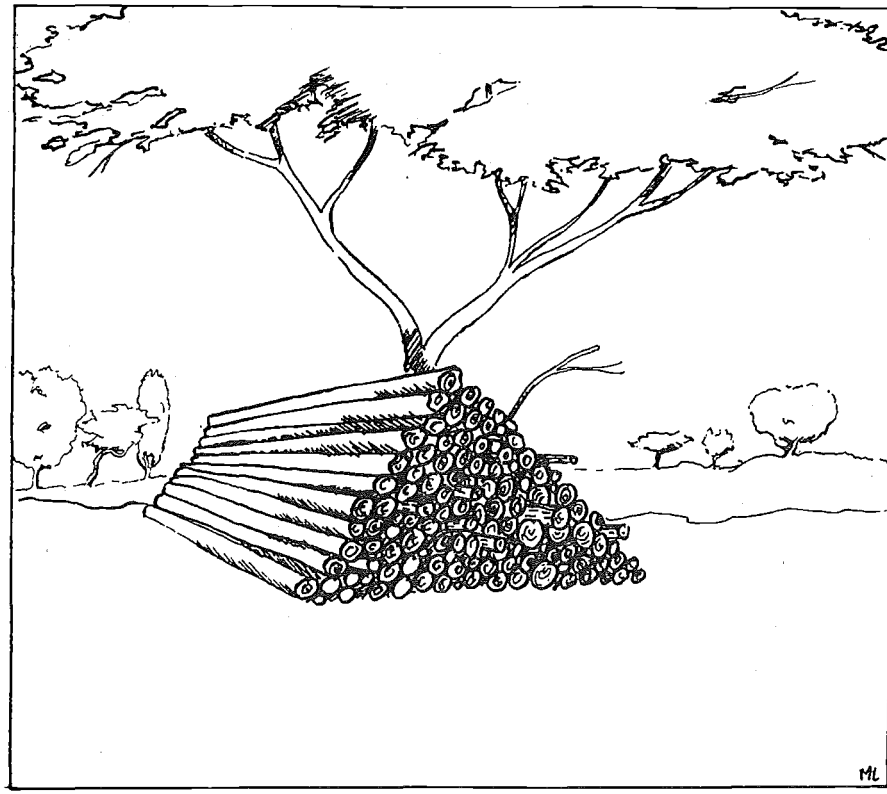
Mti hawendi ila kwa nyenzo

A log can not move save by the help of rollers

Most men interviewed stated that timber was a valuable product of indigenous species, but due to the increasing scarcity of many of the preferred species, timber is not as an important an item as it has been in the past. However, the market for timber from cultivated trees is growing, as demand continues to increase and the supply from indigenous forests is depleted. Timber is generally sawn into boards and used in house construction (rafters, doors, and frames), for furniture, and for other constructed items. Often timber is sold directly to the consumer at the pitsawing site.

Throughout the regions visited in Tanzania farmers commented on the disappearance of well-known timber species. In many cases farmers have not used *Prunus africana, Ocotea usambarensis* or *Olea europaea* for more than 5 years, though they mentioned these species as preferred and would readily use them again if they were available.

In Songea district of Ruvuma region some farmers involved in the timber business have begun planting *Breonadia salicina* and *Pterocarpus angolensis* due to the



depletion of indigenous timber species. Timber has been a good source of income and farmers feel that it is now essential to develop alternative timber supplies if timber is to remain a significant income earner. Therefore, it is important that indigenous trees are integrated into planting schemes designed to produce timber.

Species for sawn timber should:

* grow quickly;
* have straight stems, uniform size, and small branches;
* have good physical, mechanical, seasoning, preserving, and processing properties;
* be naturally pruning and rapidly self-healing;
* have other uses.

Furniture making is an important source of income for carpenters in rural areas. In most villages several men work independently but often cooperate to secure raw materials from pitsawyers, and in some cases they even share tools. Occasionally carpenters receive orders from within the village, but it is more likely that items are sold in either local weekly markets or in nearby towns. Items produced and sold include boxes, tables, chairs, bed frames, and stools.

TABLE 3.9
Timber and Furniture Prices

Selected Timber Prices (TSH/running foot - 1992)

Species	Government Price	Forest Site Price	Village Price
Breonadia salicina	-	85	100
Ocotea usambarensis	64	55	65
Khaya anthotheca	48	30	58
Podocarpus latifolius	36	30	58
Pterocarpus angolensis	74	85	100
Cordia africana	50	55	58

Selected Furniture Prices (TSH/item - 1992)

Item	Species	Market Price
box	*Podocarpus latifolius*	1400
chair	*Ocotea usambarensis*	1400
table	*Ocotea usambarensis*	1400
stool	*Ocotea usambarensis*	450
cupboard	*Commiphora ugogoensis*	15000
bed	*Pterocarpus angolensis*	7000/bed
double chair	*Khaya anthothaca*	9000/unit

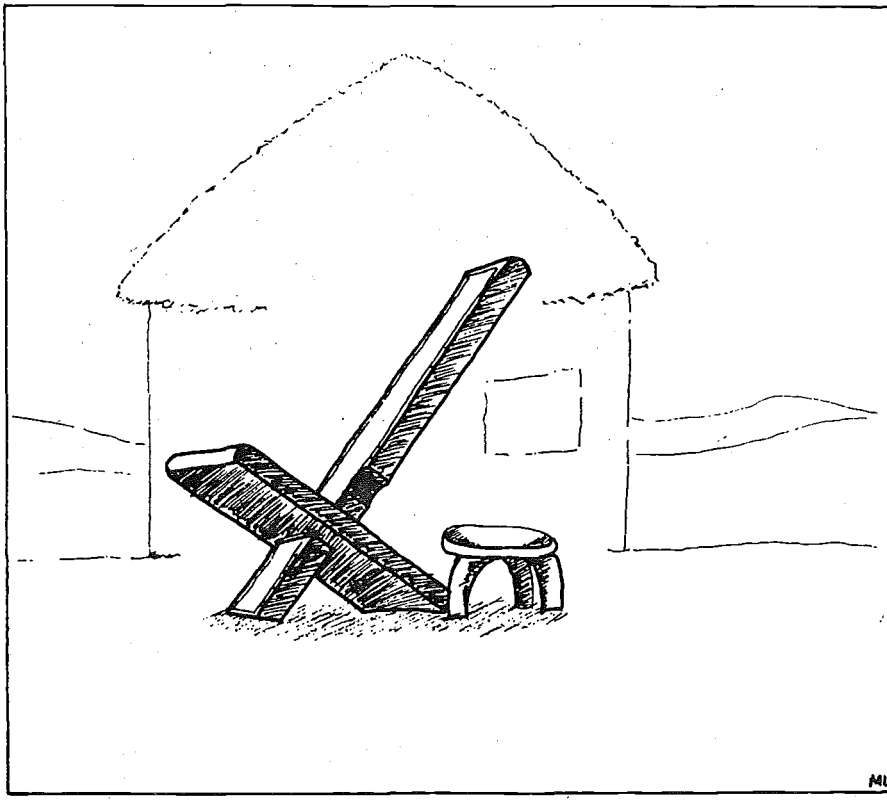


TABLE 3.10
Preferred Furniture Species

ACACIA ABYSSINICA
ACACIA TORTILIS
AFZELIA QUANZENSIS
BALANITES AEGYPTIACA
BERCHEMIA DISCOLOR
BREONADIA SALICINA
BRIDELIA MICRANTHA
BURKEA AFRICANA
COMMIPHORA EMINII
COMMIPHORA MOLLIS
COMMIPHORA TROTHAE
COMMIPHORA UGOGOENSIS
CORDIA AFRICANA
CORDIA SINENSIS
DIOSPYROS MESPILIFORMIS
EUCLEA DIVINORUM
FAUREA SALIGNA
KHAYA ANTHOTHECA
LANNEA SCHWEINFURTHII
MARKHAMIA OBTUSIFOLIA
MARKHAMIA ZANZIBARICA
MILICIA EXCELSA
OCOTEA USAMBARENSIS
OLEA CAPENSIS
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS
PODOCARPUS LATIFOLIUS
PRUNUS AFRICANA
PTEROCARPUS ANGOLENSIS
RAUVOLFIA CAFFRA
SYZYGIUM CORDATUM
TAMARINDUS INDICA
TERMINALIA SERICEA
TRICHILIA EMETICA
UAPACA KIRKIANA
VITEX DONIANA
XERODERRIS STUHLMANNII

TABLE 3.11
Preferred Timber Species

ACACIA ABYSSINICA
ACACIA ALBIDA (F. ALBIDA)
ACACIA POLYACANTHA
ACACIA SIEBERANA
AFZELIA QUANZENSIS
ALBIZIA GUMMIFERA
ALBIZIA HARVEYI
ALBIZIA PETERSIANA
ALBIZIA VERSICOLOR
ALLANBLACKIA STUHLMANNII
BALANITES AEGYPTIACA
BERCHEMIA DISCOLOR
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS
BREONADIA SALICINA
BRIDELIA MICRANTHA
BURKEA AFRICANA
CASSIPOUREA MALOSANA
COMBRETUM ZEYHERI
COMMIPHORA MOLLIS
CORDIA AFRICANA
DIOSPYROS MESPILIFORMIS
FAUREA SALIGNA
FICUS SYCOMORUS
FLACOURTIA INDICA
HAGENIA ABYSSINICA
JUNIPERUS PROCERA
KHAYA ANTHOTHECA
LANNEA SCHWEINFURTHII
MILICIA EXCELSA
OCOTEA USAMBARENSIS
OLEA CAPENSIS
OLEA EUROPAEA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS
PODOCARPUS LATIFOLIUS
PRUNUS AFRICANA
PTEROCARPUS ANGOLENSIS
RHUS NATALENSIS
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
TERMINALIA SERICEA
TRICHILIA EMETICA
UAPACA KIRKIANA
VITEX DONIANA
WARBURGIA SALUTARIS

3.7 Honey

Fuata nyuki, ule asali

Follow the bees that you may eat honey

Traditional beekeepers make their living from the forests where hives are put in carefully selected trees. Honey is a uniquely exploited product in that it does not compete with other land uses, or cause land degradation, although burning has been mentioned as an adverse effect of traditional beekeeping practices. Honey and wax appear to be under-exploited and demand for both is said to be stronger than the supply. In addition to food, honey is also used in making *pombe* and medicines.

> Honey is one of the most important commercial products from the forests of Tanzania.

A farmer in the Kilimanjaro area said that he produced about 7 to 10 debes of honey a year (1 debe = approximately 20 litres or about 20 kilograms). If he sold it in the village he received 7000 TSH per debe, whereas in Moshi he received 10000 TSH per debe. One traditional beehive produces from 15 to 45 kilograms per year of honey and 1 kilogram per year of wax. In some villages on the slopes of Mt. Kilimanjaro, farmers reported that some of the bees had disappeared due to coffee pests, or perhaps the use of pesticides.

Hives are made of hard durable species such as *Commiphora eminii, Rauvolfia caffra, Acacia albida,* and *Ocotea usambarensis.* They are usually hung in trees that are easy to climb, and are not too large or soft.

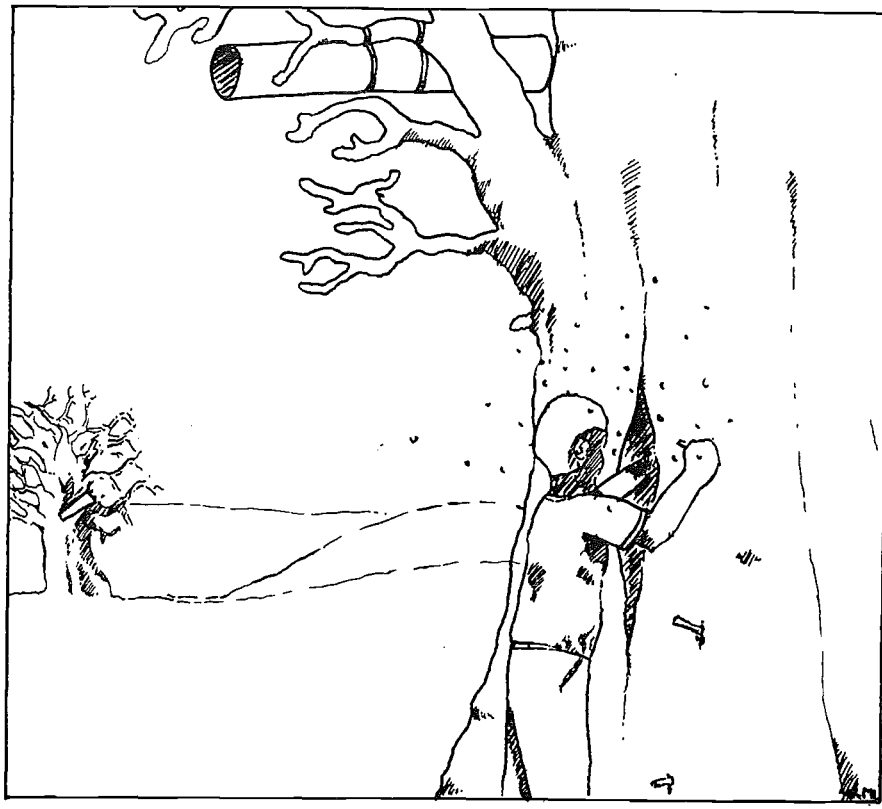
Afzelia quanzensis was mentioned as a tree bees prefer for nectar. Farmers also noted that the following species are highly preferred by bees for gathering nectar: *Rauvolfia caffra, Commiphora ugogoensis, Albizia gummifera, Grewia spp., Parinari excelsa, Syzygium guineense,* and *Ficus sycomorus.*

TABLE 3.12
Preferred Beehive Species

ACACIA ALBIDA (F. ALBIDA)	CORDIA AFRICANA
ACACIA TANGANYIKENSIS	CORDIA SINENSIS
ACACIA TORTILIS	CROTON MACROSTACHYUS
ALBIZIA GUMMIFERA	DALBERGIA MELANOXYLON
ALBIZIA VERSICOLOR	ERYTHRINA ABYSSINICA
BRACHYSTEGIA BOEHMII	FAUREA SALIGNA
BRACHYSTEGIA BUSSEI	FICUS SYCOMORUS
BRACHYSTEGIA SPICIFORMIS	JUNIPERUS PROCERA
COMMIPHORA AFRICANA	OCOTEA USAMBARENSIS
COMMIPHORA EMINII	RAUVOLFIA CAFFRA
COMMIPHORA MOLLIS	XERODERRIS STUHLMANNII
COMMIPHORA UGOGOENSIS	

TABLE 3.13
Preferred Bee Plant Species

ACACIA ALBIDA (F. ALBIDA)	ERYTHRINA ABYSSINICA
ACACIA MELLIFERA	FAUREA SALIGNA
ACACIA NILOTICA	FICUS SYCOMORUS
ACACIA SIEBERANA	FICUS VALLIS-CHOUDAE
ACACIA TORTILIS	GREWIA SPP.
ADANSONIA DIGITATA	HAGENIA ABYSSINICA
AFZELIA QUANZENSIS	JULBERNARDIA GLOBIFLORA
ALBIZIA GUMMIFERA	KIGELIA AFRICANA
BERCHEMIA DISCOLOR	LONCHOCARPUS CAPASSA
BRACHYSTEGIA BOEHMII	OLEA EUROPAEA
BRACHYSTEGIA BUSSEI	PARINARI EXCELSA
BRACHYSTEGIA SPICIFORMIS	PRUNUS AFRICANA
COMBRETUM LONGISPICATUM	PTEROCARPUS ANGOLENSIS
COMBRETUM MOLLE	RAUVOLFIA CAFFRA
COMMIPHORA UGOGOENSIS	SYZYGIUM GUINEENSE
CORDIA AFRICANA	TAMARINDUS INDICA
CORDIA SINENSIS	TREMA ORIENTALIS
CROTON MACROSTACHYUS	TRICHILIA EMETICA
CROTON MEGALOCARPUS	UAPACA KIRKIANA
DICHROSTACHYS CINEREA	VITEX DONIANA
DIOSPYROS MESPILIFORMIS	VITEX PAYOS

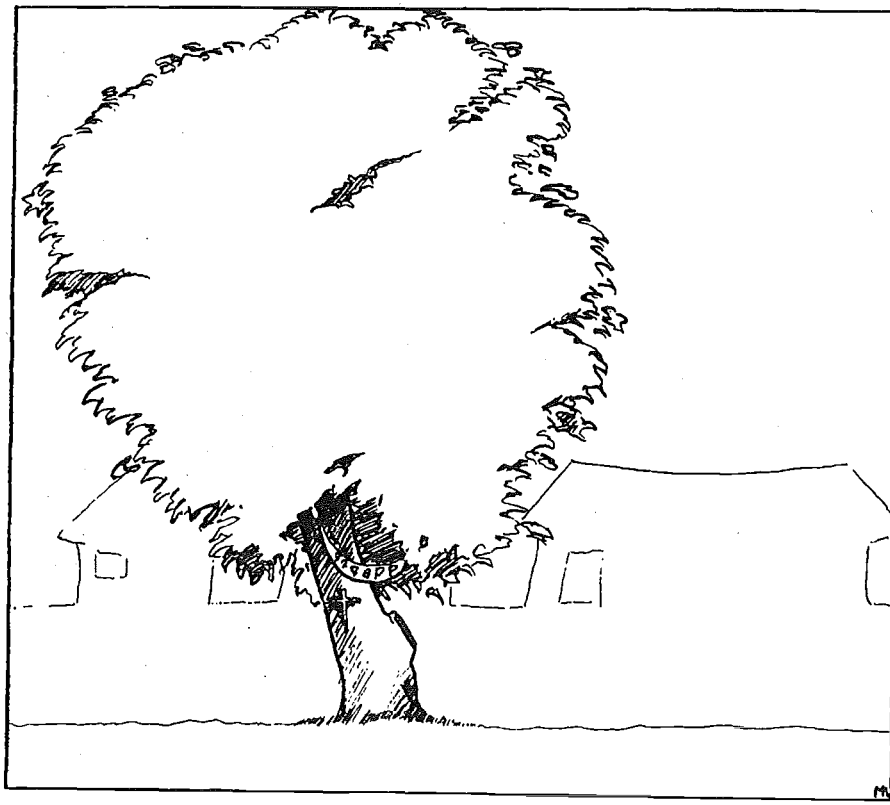


3.8 Ritual/Spiritual

Kivuli cha mvumo huwfunika walio mbali
The shadow of a date palm provides a shelter for those who are far away

It is almost impossible to generalize across Tanzania about the use of forests for ritual and spiritual functions. The variety of cultural functions are as numerous and diverse as the communities and tribes of the country. However, without doubt, through time forests have been and still are an integral aspect of the social structure, religion, art, history, medicine, and politics of a community. Forests feature, both tangibly and intangibly, in all aspects of daily life. They are viewed as both sources of and protectors against evil and as providers of fortune and power.

Certain trees can serve to link the living with their ancestors, as is often symbolized by the relationship between the sky and the earth. Sometimes gifts are given as a means of showing ancestors that they have not been forgotten. Gifts such as flowers or alcohol are placed at the foot of the tree as an offering which is symbolic of giving food to ancestors through the tree. Certain *Commiphora spp.* are regarded as spiritual trees that provide a means of communicating with ancestors.



Trees also serve as a symbol for beliefs within an individual's life. In Arusha, *Ficus sycomorus* is believed to bring good luck. Those passing by place grass or flowers at the base as an offering and in return ask God to bless them and bring them good luck. Another important tree is *Trichilia emetica* which serves as a resting spot during a journey. Before leaving the traveller prays for good luck and health.

Select species are often considered sacred, possessing special powers that can aid, for instance in fertility and birth, sickness, or expelling evil spirits. For example, *Ficus sycomorus* is revered by some in Dodoma as a provider of water. *Euphorbia candelabrum* is used to drive witches from a village. Members of the village take branches and leaves and place them on the doorstep of the witch. This indicates to all that the witch has been identified and acts as a warning that the witch should leave the village immediately. Both *Lannea schweinfurthii* and *Lonchocarpus capassa* are used to rid the body of witchcraft. If someone has been bewitched or has had a disaster, the person boils the roots of *L. schweinfurthii* and then washes in the water, which is then poured out at the nearest road junction. The root of *L. capassa* is tied around the leg of the bewitched person. After a certain time the bark of the root is boiled in water and the bewitched person takes a bath in the water.

Forests and particular trees are also the setting for many cultural events and serve both practical and symbolic judicial roles.

Grewia bicolor is a special shade tree in some villages in Dodoma where traditional meetings and burials take place. In the rural areas of Moshi, every chief must have the shade of a *Ficus thonningii* to sit, pray, and think under. In several areas sacred groves of trees are protected by local people, and are a place to settle disputes. Each community has its own traditions associated with sacred trees, and as a result the species tend to vary greatly.

TABLE 3.14
Species of Ritual/Spiritual Value

Often-mentioned trees having special cultural significance in localized areas and never cut include, *Ficus sycomorus, Syzygium cordatum,* and *Kigelia africana.*

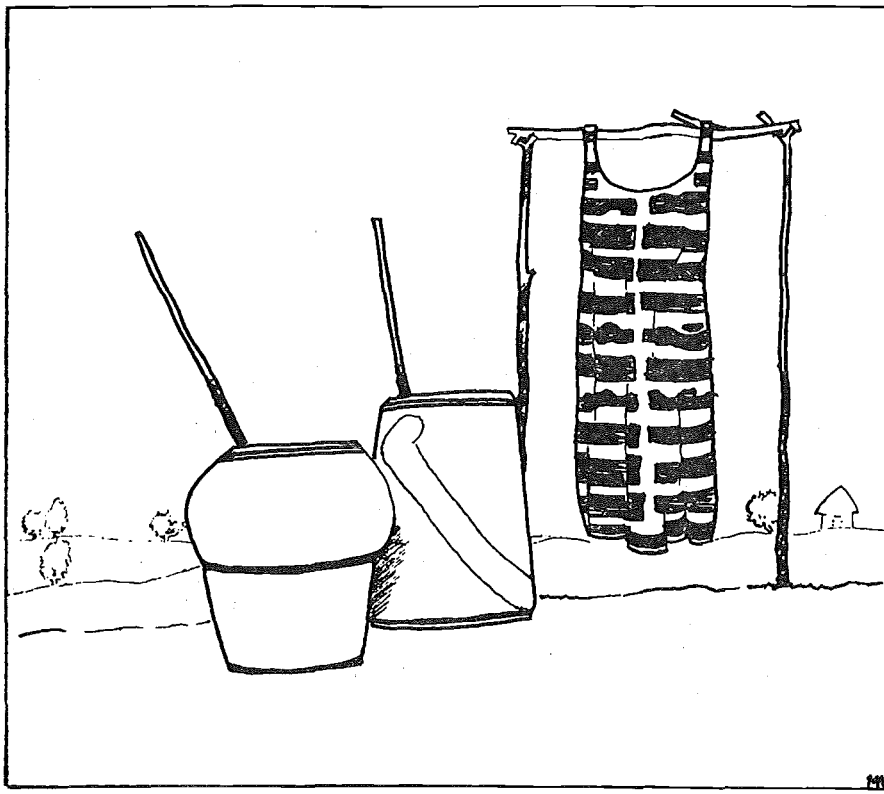
ALBIZIA GUMMIFERA	GREWIA BICOLOR
BALANITES AEGYPTIACA	KIGELIA AFRICANA
CORDIA SINENSIS	LANNEA SCHWEINFURTHII
CROTON MACROSTACHYUS	LONCHOCARPUS CAPASSA
ENTADA ABYSSINICA	MARKHAMIA OBTUSIFOLIA
ERYTHRINA ABYSSINICA	PERICOPSIS ANGOLENSIS
EUPHORBIA CANDELABRUM	SOLANUM INCANUM
FAUREA SALIGNA	SYZYGIUM CORDATUM
FICUS SYCOMORUS	TRICHILIA EMETICA
FICUS THONNINGII	XERODERRIS STUHLMANNII

3.9 Dye

Ukiona zinduna, ambari iko nyuma
If you see amber, ambergris is not far behind

Dyes of various shades (black, red, orange, yellow, green, and blue) can be extracted from the leaves, bark, or roots of many of the indigenous trees of Tanzania. Dyes are primarily used to colour fabric and fibre materials (used to make baskets and mats); for decorating the walls of houses and buildings with murals; in crafts, for example painting spoons and walking sticks; and as a form of make-up for women. Women use dyes as body paint to colour their toes, fingernails, lips, hands and feet (usually either red or black).

Dyes are usually extracted from the leaves, bark, roots, or stem by boiling in water. The dye is then 'fixed' or made permanent by adding lemon juice and salt. Some species that were mentioned as good sources of dye include: *Bridelia micrantha, Milicia excelsa, Pterocarpus angolensis,* and *Syzygium cordatum.* Henya, a popular red dye, could be purchased in some of the larger town markets for about 10 TSH per spoonful.



Despite the numerous potential uses for and sources of dyes, in many parts of the country women and to a lesser extent men, felt that they did not know enough about the whole process to use dyes regularly. There seemed to be a lack of widespread information on which species and specifically which tree parts, can be used for dye. In many villages people said they had never used dyes and they did not know of any trees which could be used for dyeing. However people, especially women expressed the desire to learn more about using plants in general for dyeing. This situation indicates the need for developing and promoting the use of natural dyes in Tanzania.

TABLE 3.15
Dye Species Identified

Species that were identified as having other important uses which also have parts that can be used for natural dyes, include:

ACACIA LAHAI
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA TORTILIS
ADANSONIA DIGITATA
ALLANBLACKIA STUHLMANNII
ANNONA SENEGALENSIS
BERCHEMIA DISCOLOR
BRACHYSTEGIA SPICIFORMIS
BRIDELIA MICRANTHA
COMMIPHORA AFRICANA
DALBERGIA MELANOXYLON
DALBERGIA NITIDULA
DIOSPYROS MESPILIFORMIS
ERYTHRINA ABYSSINICA
EUCLEA DIVINORUM
FAUREA SALIGNA
HAGENIA ABYSSINICA
JULBERNARDIA GLOBIFLORA
KHAYA ANTHOTHECA
KIGELIA AFRICANA
LANNEA SCHWEINFURTHII
MILICIA EXCELSA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PTEROCARPUS ANGOLENSIS
STRYCHNOS COCCULOIDES
SYZYGIUM CORDATUM
TREMA ORIENTALIS
VITEX DONIANA
XERODERRIS STUHLMANNII

3.10 Land Improvement

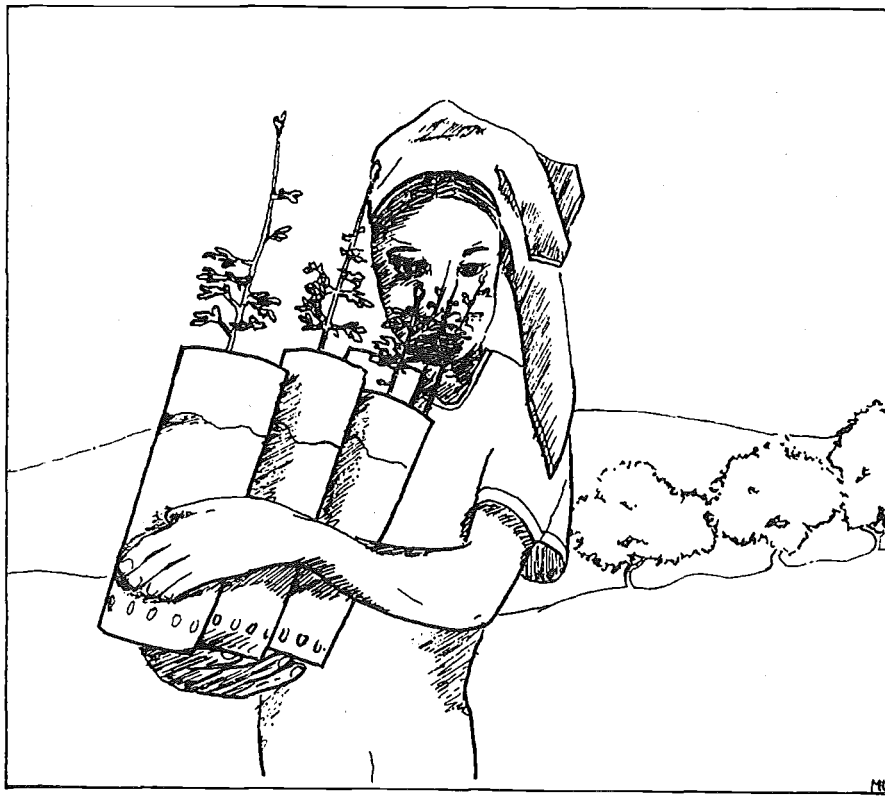
Aisifuye mvua imemnyea

He who praises rain has been rained on

Many indigenous species provide environmental benefits as well as multiple economic uses. Even though much research on the ecology, reproduction, agroforestry potential, and economic uses of indigenous species remains to be done, it is known that many of these trees have positive effects on soil properties, and contribute to the environmental sustainability of traditional agroforestry systems (Young 1989).

Indigenous trees play a well-recognized role in maintaining and improving agricultural production by protecting water supplies, stabilizing soil, and by improving soil fertility and water retention. The value of trees in general, as stabilizers and enhancers of the environment is well-known and certainly is not new to most farmers in Tanzania. Most farmers could name at least 3 local species which they regarded as valuable for protecting the environment. In many cases farmers had planted these species by vegetative propagation (cuttings or grafting) on their own land.

A significant use of indigenous trees that was mentioned frequently by farmers was for water conservation and as a water source. *Ficus thonningii* and *Ficus sycomorus*



were cited frequently for this purpose. *Xeroderris stuhlmannii* was highlighted as being a useful tree for windbreaks.

The uses of trees for conserving and enriching the soil are well-known to local people. Indigenous species such as *Acacia* and *Albizia* are able to fix nitrogen in the soil, adding to soil fertility. The ability of trees to recycle nutrients that are not otherwise available to crops can reduce the need for chemical fertilizers. In addition, some trees of Tanzania, such as *Commiphora spp.* and *Rauvolfia caffra* are intercropped by Chagga farmers for their herbicidal or insecticidal properties (Fernandes et al. 1984).

Trees grown as windbreaks should:

* tolerate harsh environments;
* have strong roots but should not interfere with nearby crops;
* resist pests and diseases but not harbour any which affect crops;
* grow quickly and live long;
* keep lower limbs for a long time;
* have a bushy full crown that allows some wind to penetrate.

The leaf fall from deciduous trees provides mulch, and helps to build up the organic content of topsoil. Leaf fall also adds nutrients, and improves soil texture. The root systems of trees improve drainage and aeration, and aid in retaining soil on sloping land. The shade and litter provided by trees lowers soil temperatures, and creates a habitat for microorganisms, which aid in the breakdown of organic matter into humus.

Indigenous trees can be intercropped with annual crops, and provide agroforestry benefits such as improved productivity, diversity of products (such as fodder), or erosion control. For example, Chagga farmers intercrop an average of 39 indigenous trees with their annual crops to obtain a wide range of economic and environmental benefits (Fernandes et al. 1984).

Several indigenous species can be used in the treatment of erosion, particularly if they are fast growing, nitrogen fixing, and tolerant of harsh conditions. Tree planting alone may not control severe erosion and land degradation problems, because the establishment of a ground cover is also important in retaining the topsoil. However, many local trees are known to improve the fertility and condition of the soil and control erosion, and may be better suited to local conditions than exotics with similar

Trees grown for soil protection and improvement should:

* grow quickly under adverse conditions;
* have an extensive and strong root system to bind the soil;
* fix nitrogen;
* tolerate fire;
* reproduce naturally and dependably.

properties. In structural conservation measures such as hedgerows, terraces, and microcatchments, species such as *Acacia spp.*, *Balanites spp.*, *Tamarindus indica*, and *Olea spp.* have been used successfully in Kenya (Rocheleau et al. 1988).

TABLE 3.16
Land Improvement Species
(*N* = *Nitrogen Fixing*)

ACACIA ALBIDA (F. ALBIDA) *N*
ACACIA LAHAI *N*
ACACIA MELLIFERA *N*
ACACIA NILOTICA *N*
ACACIA POLYACANTHA *N*
ACACIA TANGANYIKENSIS
ACACIA TORTILIS *N*
ACACIA XANTHOPHLOEA *N*
AFZELIA QUANZENSIS *N*
ALBIZIA GUMMIFERA *N*
ALBIZIA HARVEYI *N*
ALBIZIA SCHIMPERANA *N*
ALBIZIA VERSICOLOR *N*
AZANZA GARCKEANA
BALANITES AEGYPTIACA *N*
BERCHEMIA DISCOLOR
BRACHYSTEGIA SPICIFORMIS *N*
BURKEA AFRICANA *N*
COMBRETUM LONGISPICATUM
COMBRETUM MOLLE
COMMIPHORA EMINII
CORDIA AFRICANA *N*
CROTON MACROSTACHYUS
CROTON MEGALOCARPUS
DALBERGIA MELANOXYLON *N*
DICHROSTACHYS CINEREA *N*
DIOSPYROS MESPILIFORMIS *N*
ENTADA ABYSSINICA *N*
ERYTHRINA ABYSSINICA *N*
EUPHORBIA TIRUCALLI
FAUREA SALIGNA
FICUS SYCOMORUS
FICUS THONNINGII
FICUS VALLIS-CHOUDAE
HAGENIA ABYSSINICA
JULBERNARDIA GLOBIFLORA *N*
JUNIPERUS PROCERA
KHAYA ANTHOTHECA
KIGELIA AFRICANA
LONCHOCARPUS CAPASSA *N*
MILICIA EXCELSA *N*
OCOTEA USAMBARENSIS
OLEA CAPENSIS *N*
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
PERICOPSIS ANGOLENSIS *N*
PRUNUS AFRICANA
PTEROCARPUS ANGOLENSIS *N*
RAUVOLFIA CAFFRA *N*
SALVADORA PERSICA
TAMARINDUS INDICA *N*
TECLEA NOBILIS
TERMINALIA SERICEA
TREMA ORIENTALIS *N*
TRICHILIA EMETICA
VANGUERIA INFAUSTA *N*
VITEX DONIANA *N*
WARBURGIA SALUTARIS *N*
XERODERRIS STUHLMANNII

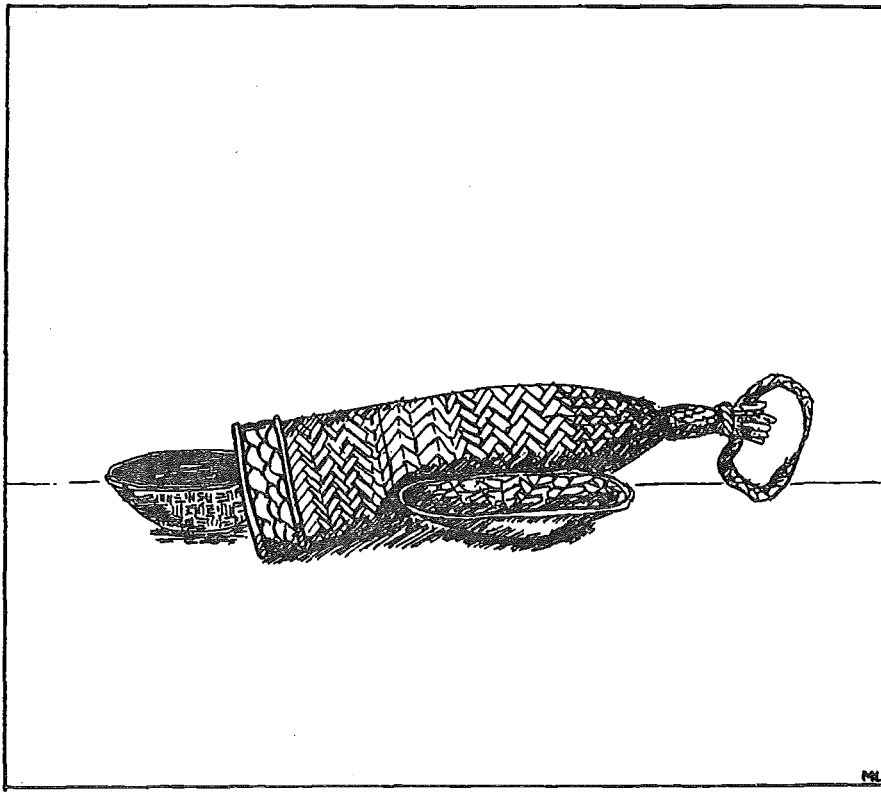
3.11 Fibre

Ukuukuuwa kamba si upya wa ukambaa

A well-worn coir rope is better than a new rope made from raffia

Indigenous trees are an important source of fibre for use as thread, rope, twine, cloth, and building materials. These items are important in terms of household use, agricultural production, and for fishing and hunting implements. Maize and grain storage containers are often made of fibres from the forest. Baskets and bags for agricultural produce made from *Oxytenanthera abyssinica* are used for transporting vegetables and fruits, for example tomatoes in Iringa. *Adansonia digitata* is well-known for its fibre which is used for ropes, in bed making, and though infrequently these days, for cloth.

Thread from tree roots is used for sewing items such as bags and sacks and is harvested from *Acacia nilotica, Tamarindus indica, Cordia africana,* and *Lannea schweinfurthii,* among just a few local species. In Dodoma, thread from the roots of *Brachystegia spiciformis* and *Acacia tortilis* was sold in local markets for 50 TSH per kilogram.



Many people still prefer to use thorns as needles since metal ones cost approximately 70 TSH each and often are not as strong or durable. Tasks which require sewing with such sturdy needles include closing grain bags and sewing drums. Preferred species for needles include *Olea capensis, Albizia schimperana, Acacia nilotica,* and *Dichrostachys cinerea.*

Table 3.17
Preferred Fibre Species

ACACIA GERRARDII
ACACIA NILOTICA
ACACIA TORTILIS
ADANSONIA DIGITATA
ALBIZIA SCHIMPERANA
AZANZA GARCKEANA
BRACHYSTEGIA BOEHMII
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS
BURKEA AFRICANA
COMBRETUM ZEYHERI
CORDIA AFRICANA
CORDIA SINENSIS
DICHROSTACHYS CINEREA
EUCLEA DIVINORUM
FICUS THONNINGII
GREWIA BICOLOR
GREWIA MOLLIS
JULBERNARDIA GLOBIFLORA
LANNEA SCHWEINFURTHII
MARKHAMIA ZANZIBARICA
OLEA CAPENSIS
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
RHUS NATALENSIS
SALVADORA PERSICA
TAMARINDUS INDICA
TERMINALIA SERICEA
TREMA ORIENTALIS

3.12 Beverages/Food/Condiments

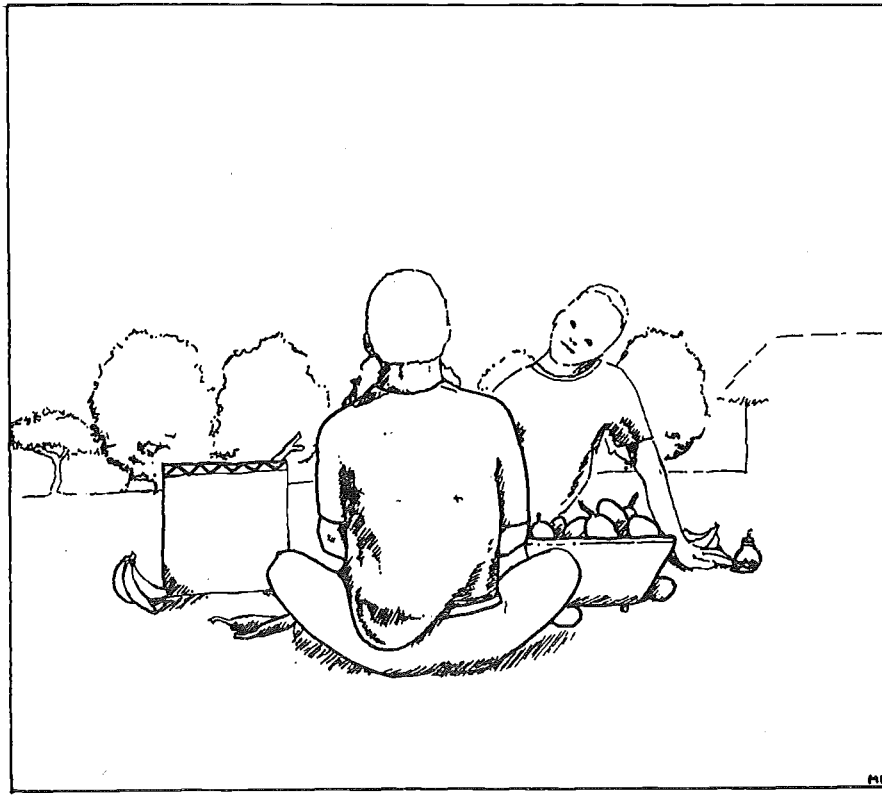
Ungalijua alacho nyuki, usingalionja asali

Had you known what bees eat you would not have tasted honey

There are a number of edible plant products gathered from forests including leaves, roots, seeds, nuts, tubers, fungi, and salt. These foods are important as they add diversity and variety to the diet, while supplying essential vitamins, minerals, and protein.

The contribution of forest foods to household diets seems to vary tremendously from area to area and in most places it was difficult to assess. Problems arose in identifying species, as in many villages the names given were local and not known even to the foresters working in the area. Trying to determine the frequency and quantity of forest foods consumed was also problematic. As a result, many local names recalled by farmers are not included in this section and no attempt was made to try to estimate the quantity of forest products consumed at the household level.

Leaves are used for domestic consumption as a relish that is eaten with most staples. They are gathered primarily from herbs and bushes in fields and gullies, although occasionally they are harvested from trees. However, in most parts of Tanzania it



appears that the forests are of minor significance for the collection of these leaves when compared with fields and gullies. Green leafy vegetables are mainly picked during the rainy season when they are growing in fields and on uncultivated land. As livestock grazing gradually becomes more controlled, human consumption of suitable wild plants is likely to increase as these plants will be spared from animals. Mushrooms are sometimes collected from the forest during the rainy season.

Some of the more popular species from which drinks are made include *Adansonia digitata, Acacia nilotica,* and *Tamarindus indica.*

TABLE 3.18
Preferred Food/Condiment Species

ACACIA ALBIDA (F. ALBIDA)
ADANSONIA DIGITATA
AFZELIA QUANZENSIS
ALLANBLACKIA STUHLMANNII
AZANZA GARCKEANA
BALANITES AEGYPTIACA
COMBRETUM ADENOGONIUM
COMMIPHORA AFRICANA
EUCLEA DIVINORUM
FICUS SYCOMORUS
GREWIA BICOLOR
KIGELIA AFRICANA
LONCHOCARPUS CAPASSA
OLEA EUROPAEA
OXYTENANTHERA ABYSSINICA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
SALVADORA PERSICA
VITEX DONIANA
WARBURGIA SALUTARIS
XIMENIA AMERICANA
XIMENIA CAFFRA

TABLE 3.19
Preferred Beverage Species

ACACIA NILOTICA
ADANSONIA DIGITATA
BERCHEMIA DISCOLOR
COMMIPHORA AFRICANA
DIOSPYROS MESPILIFORMIS
FICUS THONNINGII
GREWIA MOLLIS
KIGELIA AFRICANA
OXYTENANTHERA ABYSSINICA
PARINARI EXCELSA
RAUVOLFIA CAFFRA
RHUS NATALENSIS
SYZYGIUM CORDATUM
TAMARINDUS INDICA
UAPACA KIRKIANA
XIMENIA AMERICANA

3.13 Fruits

Mwanzo kokochi, mwisho nazi
The beginning is a bud, the end is a coconut

Fruits and berries collected in the forest or from trees retained on *shamba* lands, are an important source of minerals and vitamins, especially for children. Findings from the surveys indicate that the significance of these fruits is nutritional rather than economical, as most are consumed in the forest rather than sold in markets. The fact that different species ripen during different seasons (although they are more frequent during the dry season), enables indigenous fruits to compensate for variations in nutrient intake from green leafy vegetables and cultivated fruits and vegetables.

In some villages people indicated that local fruits are not often eaten as a supplement to their diets and that they rely fully on cultivated fruits. They said that fruits, such as banana, papaya, mango, and citrus, are much more convenient to harvest and that harvesting is spaced to ensure an adequate supply of fruits. However, in most villages indigenous fruits and berries were seen as a free source of food that required no preparation and provided a nutritious snack for children while in the forest. Adults also mentioned that they occasionally ate local fruits.

TABLE 3.20
Fruits and Berries

Species	Ripening Period	Market Price (TSH - 1992)
Adansonia digitata	May-Aug	10 TSH/fruit
Annona senegalensis	Dec-Mar	8-10 TSH/fruit
Azanza garckeana	May -Aug	occasionally sold
Balanites aegyptiaca	Mar	children eat
Berchemia discolor	Mar-May	children eat
Ficus sycomorus	Jun-Dec	children eat
Flacourtia indica	Dec-Jul	children eat
Grewia bicolor	Apr-Sept	20 TSH/cup
Parinari curatellifolia	Oct-May	pulp occasionally sold
Strychnos cocculoides	Apr-Jul	not sold
Syzygium guineense	Feb-Jun	20 TSH/cup
Tamarindus indica	Jun-Aug	9 TSH/fruit
Uapaca kirkiana	Sept-Dec	10 TSH/2-3 fruits
Vangueria infausta	Jul-Dec	occasionally sold
Vitex doniana	Jan-Apr	1 TSH/fruit
Vitex payos	Dry Season	10 TSH/30 fruits
Ximenia americana	Varies	children eat
Ximenia caffra	Jan-Feb	5-10 TSH/fruit

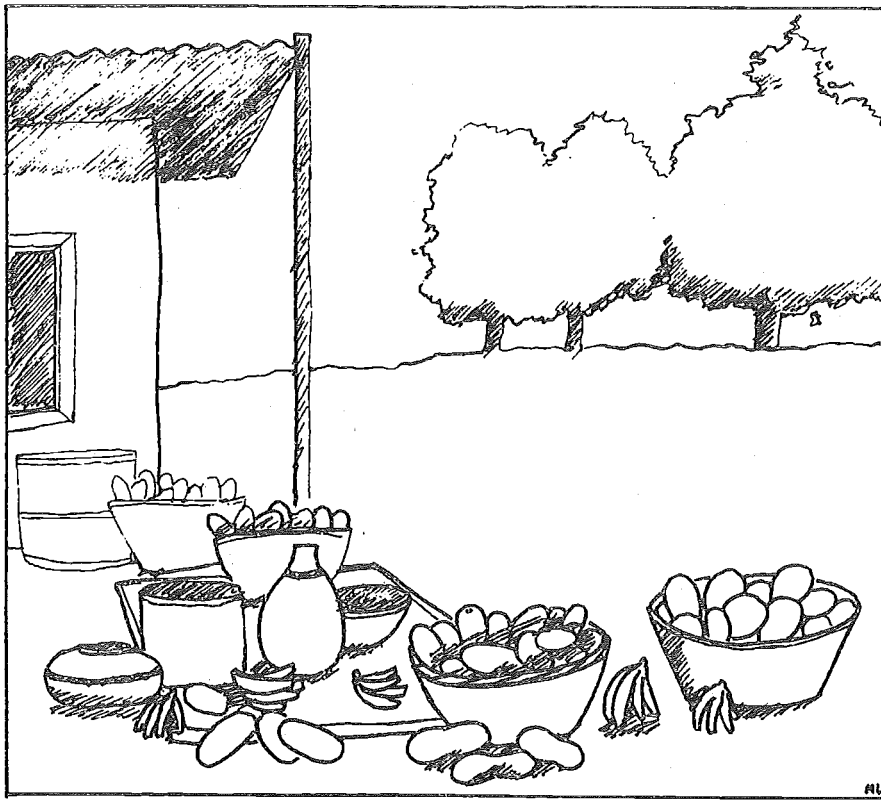


TABLE 3.21
Preferred Fruit Species

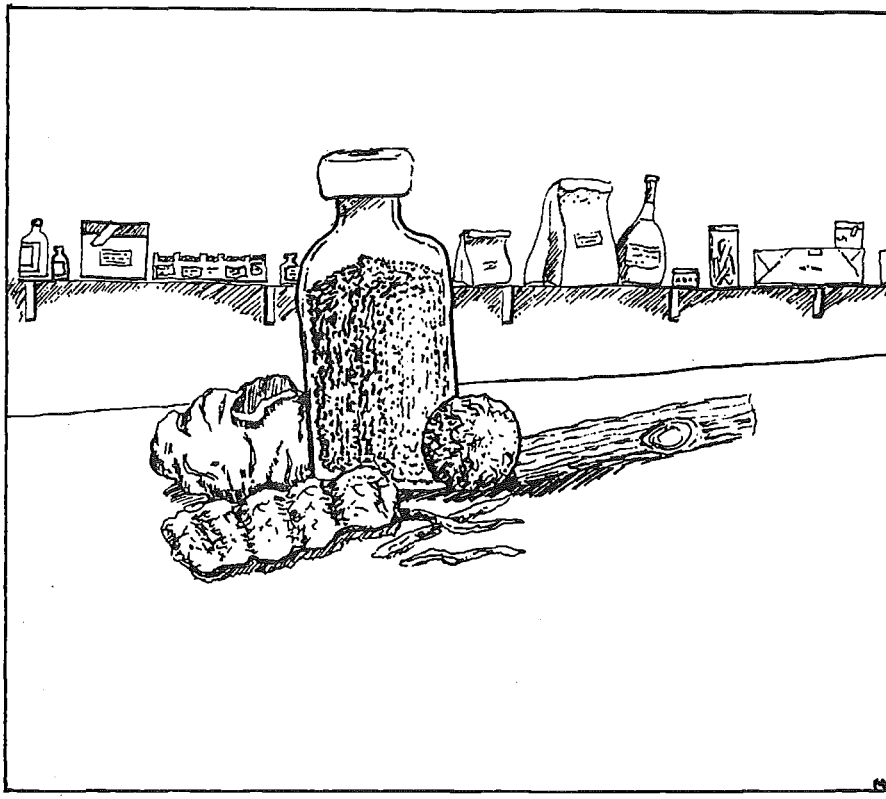
ACACIA ALBIDA (F. ALBIDA)
ADANSONIA DIGITATA
AFZELIA QUANZENSIS
ANNONA SENEGALENSIS
AZANZA GARCKEANA
BALANITES AEGYPTIACA
BERCHEMIA DISCOLOR
BOSCIA MOSSAMBICENSIS
BRIDELIA MICRANTHA
COMMIPHORA AFRICANA
CORDIA AFRICANA
CORDIA SINENSIS
DIOSPYROS KIRKII
DIOSPYROS MESPILIFORMIS
EUCLEA DIVINORUM
FICUS SYCOMORUS
FLACOURTIA INDICA
GREWIA BICOLOR
GREWIA PLATYCLADA
ILEX MITIS
KIGELIA AFRICANA
LANNEA SCHWEINFURTHII
OLEA EUROPAEA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
RHUS NATALENSIS
SALVADORA PERSICA
SOLANUM INCANUM
STRYCHNOS COCCULOIDES
STRYCHNOS INNOCUA
SYZYGIUM CORDATUM
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
TREMA ORIENTALIS
UAPACA KIRKIANA
VANGUERIA INFAUSTA
VANGUERIA MADAGASCARIENSIS
VITEX DONIANA
VITEX PAYOS
XIMENIA AMERICANA
XIMENIA CAFFRA

3.14 Medicine

Mganga hajigangi
A witch doctor does not cure himself

The importance of traditional medicine for humans, as well as animals, in most parts of Tanzania is difficult to ascertain. It would be an understatement to say that traditional medicine plays a significant role in the health care system, since this is the only affordable and accessible health care in many parts of rural Tanzania. However, it is difficult to assess the extent to which traditional medicines are still used. For example, in the Hai Mashariki division on the southern slope of Mt. Kilimanjaro a study carried out by O'Ktingati found that 30% of all trees in Chagga home gardens produced medicine for either humans or animals (O'Ktingati 1986). Discussions with farmers in the area revealed that for most serious illnesses people went to the mission for treatment. It was estimated that a household might spend about 20000 TSH per year on non-traditional medicine.

Assessing the use of traditional medicines is further complicated by the fact that in Tanzania common plant treatments are known and used by the majority of rural people. These day-to-day uses of medicinal plants do not require a medicine man or woman and are often included as part of the diet. There was no clear indication of



the extent to which medicinal plants grown in home gardens were used by households as opposed to being prescribed by local healers. In some cases the distinction between the consumption of these remedies for food versus medicine is not clear. For example the Masai use of 'soups' can be for food, as an appetite increaser, or as a digestive aid.

In addition, there is a variety of healing practices and beliefs and most practices do not distinguish between the physical and psychological elements of an illness. Many tribes in Tanzania have a dual classification for diseases: those having natural causes and those due to witchcraft or angered ancestor spirits. Most of the diseases classified by healers have a scientific equivalent in western medicine. Diseases are generally diagnosed by a healer according to both the cause and the classification of the illness. Diseases attributed to natural causes are generally treated by a herbalist or at a hospital. If the illness is due to witchcraft, a sorcerer is needed to employ counter magic. However, if the disorder is the result of angered ancestors or evil spirits, a ritual or ceremony is held to placate them. If the cause of the illness is broken cultural rules or taboos, an act of penance or restitution is prescribed (Chhabra 1984).

Tanzania is estimated to have more than 60000 traditional healers (Weenen 1990). In most parts of Tanzania there are 4 types of healers (Chhabra 1984): Herbalists, Herbalists-ritualists, Ritualists-herbalists, and Spiritualists. Most remedies in traditional medicine are prepared from various natural substances, animals and vegetables. The vegetable remedies account for about 90% of all remedies used for treatment (Chhabra 1984).

It is important that significant medicinal and aromatic plants are identified, so that appropriate conservation measures can be taken to ensure that these medicinal products continue to be available to sick people on a sustainable basis.

Even though botanical studies in Tanzania have identified a vast number of medicinal plants from the forest that have the potential for medicinal uses, it is difficult to assess which species are of major economic importance locally. This situation is further complicated by the secretiveness of medicine people, and the tendency to hide information concerning the importance of specific local medicinal plants. Markets provide an excellent starting point for identifying species for which people are willing to pay. Sometimes the price of a particular medicine is set and advertised, while in other cases the price is either negotiated or patients pay what they can.

There are a number of commonly used tree medicines that are marketed with the intention of reaching the urban consumer. Most medicines were collected by the seller who is a medicine woman or man. However, all markets surveyed had medicines available that were not local to the area.

A very common item in all markets surveyed is *mswaki* or chew sticks. *Mswaki* sticks which are used as toothbrushes are frequently purchased by rural people as well as those living in urban areas.

The following table gives an indication of the variety of medicines sold in local markets in Tanzania.

TABLE 3.22
Variety of Medicines in Local Markets

Species	Price: TSH/unit - 1992	Medicinal use
Warburgia salutaris	200-300/ bark piece	malaria, colds, diarrhoea, general body pain
Olea europaea	200/bark piece	bottle sterilizer, round worm repellant - animals and people
Lannea schweinfurthii	140-200/ 14-20 spoonfuls of root powder	hernia
	750/bark piece	stomach ulcers, stomach problems - pregnant women
Salvadora persica	25-50/brush	toothbrushes (*mswaki* sticks)
Lonchocarpus capassa	250/spoonful of stem and root bark	impotency, bilharzia, hookworm
Grewia bicolor	20/bundle of bark,roots	colds, stomach problems, snake bites, syphilis
Parinari curatellifolia	50/root bundle	epilepsy

TABLE 3.23
Important Medicinal Species

ACACIA ABYSSINICA
ACACIA ALBIDA (F. ALBIDA)
ACACIA DREPANOLOBIUM
ACACIA GERRARDII
ACACIA MELLIFERA
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA SIEBERANA
ACACIA XANTHOPHLOEA
ADANSONIA DIGITATA
AFZELIA QUANZENSIS
ALBIZIA GUMMIFERA
ALBIZIA HARVEYI
ALBIZIA SCHIMPERANA
ANNONA SENEGALENSIS
BALANITES AEGYPTIACA
BOSCIA MOSSAMBICENSIS
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS
BREONADIA SALICINA
BRIDELIA MICRANTHA
BURKEA AFRICANA
COMBRETUM ADENOGONIUM
COMBRETUM LONGISPICATUM
COMBRETUM MOLLE
COMBRETUM ZEYHERI
COMMIPHORA AFRICANA
COMMIPHORA EMINII
COMMIPHORA TROTHAE
CORDIA AFRICANA
CORDIA SINENSIS
CROTON MACROSTACHYUS
CROTON MEGALOCARPUS
DALBERGIA ARBUTIFOLIA
DALBERGIA MELANOXYLON
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA
DIOSPYROS MESPILIFORMIS
ENTADA ABYSSINICA
ERYTHRINA ABYSSINICA
EUCLEA DIVINORUM
EUPHORBIA TIRUCALLI
FAUREA SALIGNA
FICUS SYCOMORUS
FICUS THONNINGII
FLACOURTIA INDICA
GREWIA BICOLOR
GREWIA MOLLIS
GREWIA PLATYCLADA
HAGENIA ABYSSINICA
ILEX MITIS
JULBERNARDIA GLOBIFLORA
JUNIPERUS PROCERA
KHAYA ANTHOTHECA
KIGELIA AFRICANA
LANNEA SCHWEINFURTHII
LONCHOCARPUS CAPASSA
MARKHAMIA OBTUSIFOLIA
MARKHAMIA ZANZIBARICA
MILICIA EXCELSA
OCOTEA USAMBARENSIS
OLEA CAPENSIS
OLEA EUROPAEA
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
PODOCARPUS LATIFOLIUS
PERICOPSIS ANGOLENSIS
PTEROCARPUS ANGOLENSIS
RAUVOLFIA CAFFRA
RHUS NATALENSIS
SALVADORA PERSICA
SOLANUM INCANUM
STROPHANTHUS EMINII
STRYCHNOS COCCULOIDES
STRYCHNOS INNOCUA
SYZYGIUM CORDATUM
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
TECLEA NOBILIS
TERMINALIA SERICEA
TREMA ORIENTALIS
TRICHILIA EMETICA
UAPACA KIRKIANA
VANGUERIA INFAUSTA
VITEX DONIANA
VITEX PAYOS
WARBURGIA SALUTARIS
XERODERRIS STUHLMANNII
XIMENIA AMERICANA
XIMENIA CAFFRA

3.15 Fencing

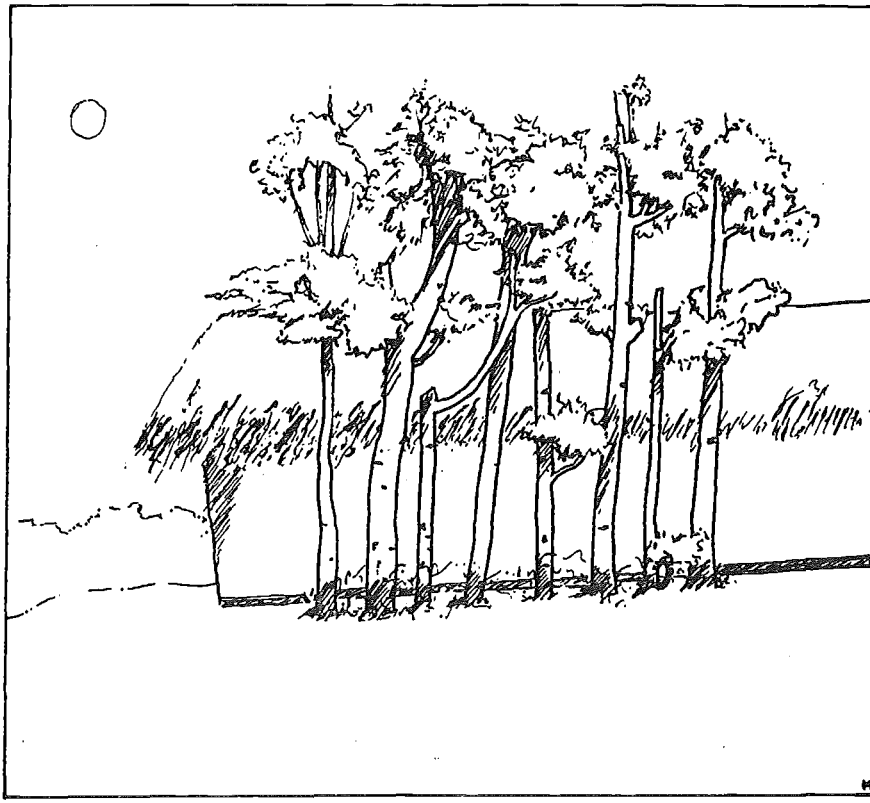
Kupanda mchongoma, kushuka ndio ngoma

You may climb a thorn tree, but coming down again is a dance

Live fences are grown around houses and home gardens. They have a number of advantages over wooden posts which are often considered to be unproductive parts of the land management system. The cost of live fencing is low, and apart from some attention at the beginning, the fence will continue to grow on its own.

With properly selected species the fence can be a source of fuelwood, medicine, fruit, food or other useful household products. Live fences also act as barriers to wind and can improve soil conditions if appropriate species are selected.

Highly valued species for live fences are *Euphorbia tirucalli, Albizia harveyi,* and *Commiphora africana.* Species used for fence poles include *Dichrostachys cinerea.* Species for both uses that were identified by farmers are found in Table 3.24.



Trees grown for live fences should:

* grow under adverse conditions with little or no maintenance;
* grow well in close spacing;
* propagate by coppicing and cuttings;
* withstand lopping and trimming;
* possess thorns, stiff branches, and leaves that animals don't like to eat;
* be resistant to pests and diseases, and have a long life;
* have other uses.

TABLE 3.24
Preferred Fencing Species

Live Fences	Post Fences
ACACIA MELLIFERA	ACACIA ALBIDA (F. ALBIDA)
ACACIA TORTILIS	ACACIA DREPANOLOBIUM
ACACIA XANTHOPHLOEA	ACACIA GERRARDII
ALBIZIA HARVEYI	ACACIA LAHAI
BALANITES AEGYPTIACA	ACACIA POLYACANTHA
COMMIPHORA AFRICANA	ACACIA XANTHOPHLOEA
COMMIPHORA EMINII	ALBIZIA HARVEYI
CROTON MEGALOCARPUS	COMBRETUM MOLLE
DICHROSTACHYS CINEREA	COMMIPHORA EMINII
EUPHORBIA CANDELABRUM	CROTON MEGALOCARPUS
EUPHORBIA TIRUCALLI	DICHROSTACHYS CINEREA
FICUS SYCOMORUS	JUNIPERUS PROCERA
FICUS THONNINGII	OLEA EUROPAEA
MARKHAMIA OBTUSIFOLIA	OXYTENANTHERA ABYSSINICA
OLEA EUROPAEA	PERICOPSIS ANGOLENSIS
OXYTENANTHERA ABYSSINICA	TAMARINDUS INDICA
	TERMINALIA SERICEA
	TREMA ORIENTALIS

3.16 Gums/Tannins/Resins/Crafts

Due to lack of detailed information on these groups of uses, only species lists will be included for gums, tannins, resins, and crafts.

Table 3.25 lists species which were identified as useful for crafts (carvings, masks, games). Species identified as important or preferred for gums, tannins, or resins are listed in Tables 3.26, 3.27, and 3.28.

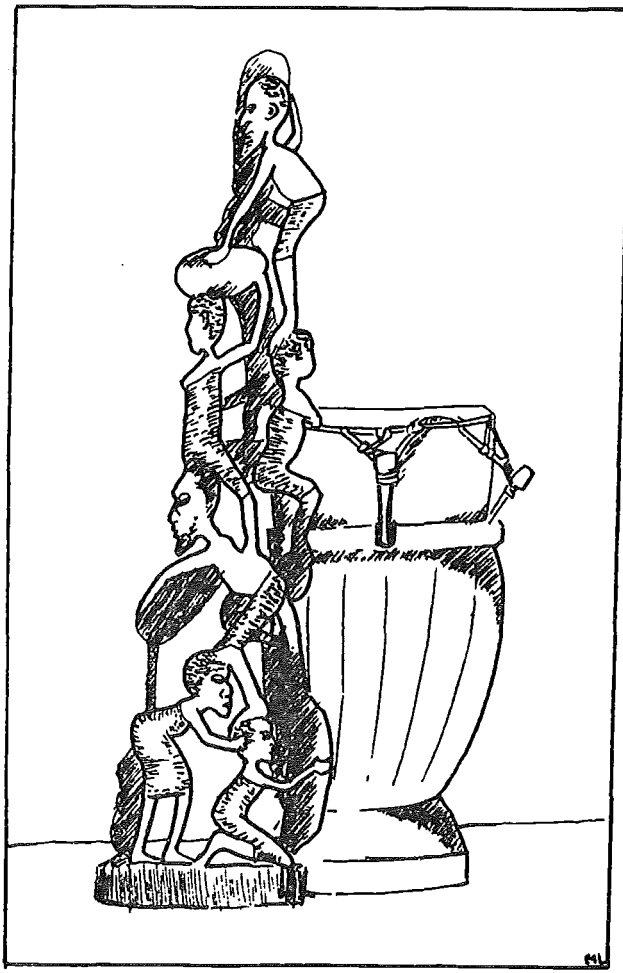


TABLE 3.25
Preferred Species for Crafts

ACACIA ABYSSINICA
COMMIPHORA MOLLIS
DALBERGIA ARBUTIFOLIA
DALBERGIA MELANOXYLON
DIOSPYROS MESPILIFORMIS
ERYTHRINA ABYSSINICA
HAGENIA ABYSSINICA
OCOTEA USAMBARENSIS
OLEA EUROPAEA
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS
PODOCARPUS LATIFOLIUS
STROPHANTHUS EMINII
VITEX DONIANA

TABLE 3.26
Important Gum Species

ACACIA ALBIDA (F. ALBIDA)
ACACIA GERRARDII
ACACIA LAHAI
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA TORTILIS
ADANSONIA DIGITATA
ALBIZIA HARVEYI
BALANITES AEGYPTIACA
BURKEA AFRICANA
COMMIPHORA AFRICANA
COMMIPHORA UGOGOENSIS
CORDIA AFRICANA
CORDIA SINENSIS
EUPHORBIA TIRUCALLI
FICUS THONNINGII
PERICOPSIS ANGOLENSIS
PTEROCARPUS ANGOLENSIS
TAMARINDUS INDICA
WARBURGIA SALUTARIS

TABLE 3.27
Important Tannin Species

ACACIA ALBIDA (F. ALBIDA)
ACACIA NILOTICA
ACACIA POLYACANTHA
ACACIA SIEBERANA
ACACIA TORTILIS
ADANSONIA DIGITATA
BRACHYSTEGIA BOEHMII
BRACHYSTEGIA SPICIFORMIS
BRIDELIA MICRANTHA
BURKEA AFRICANA
FLACOURTIA INDICA
LANNEA SCHWEINFURTHII
PARINARI CURATELLIFOLIA
PARINARI EXCELSA
SYZYGIUM GUINEENSE
TAMARINDUS INDICA
VITEX DONIANA

TABLE 3.28
Important Resin Species

ADANSONIA DIGITATA
ALBIZIA HARVEYI
BERCHEMIA DISCOLOR
BRIDELIA MICRANTHA
COMBRETUM LONGISPICATUM
COMMIPHORA AFRICANA
COMMIPHORA EMINII
WARBURGIA SALUTARIS

4. Species List

ACACIA ABYSSINICA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: umbrella thorn**

Local Names: alterara (MASAI).
Potential Uses: building materials, crafts (carvings), furniture (stools), medicine (masai soup), timber.

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ACACIA ALBIDA (FAIDHERBIA ALBIDA)

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mapagola, kababu, apple ring acacia, winterthorn

Local Names: mkololo, mkora (BONDEI, SHAMBAA, ZIGUA); mchese (FIPA); mdoledole, mgonandele, mujehe, mwaliganza, mluma (GOGO); hhangumo, tlahmo, tlehharimo (GOROWA); murunda (HAYA); mpogoro (HEHE); giermo, giwermoo, tahhumo (IRAQW); mranda (LONGO, ZINZA); mkongolo (LUGURU); ikandava (MBUGWE); mkilolo (NGURU); khaangu, mungunga (NYATURU); mgunga (PARE); igudabe, isaimo (RANGI); mpogola (SANGU, HEHE); nanda (SUKUMA); mupongoro (SUMBWA).
Potential Uses: beehives, bee plant, charcoal, domestic uses (soap, tool handles), fencing (posts), firewood, fodder, food (pods = condiment), fruits (famine food), gum, land improvement (nitrogen fixing, windbreaks), medicine, salt, shade, tannin, timber (soft).

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ACACIA DREPANOLOBIUM

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mbalibali, ululа, gall acacia

Local Names: qarbu (GOROWA, IRAQW); fughmo (IRAQW); mbulungo (ISANZU); eluai, eluwai (MASAI); mbolongo-ya-kibolo (MBUGWE); melula, malula (NYATURU); nduradura, mnduriduri (RANGI), vulula wapi, vulula, ilula lyape, (SUKUMA).
Potential Uses: building materials (*bomas*), fencing (posts), medicine.

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ACACIA GERRARDII

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: red thorn

Local Names: oing'weng'wenyi (MASAI).
Potential Uses: building materials (*bomas*), fencing (posts), fibre (rope), firewood, gum, medicine.

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** Common Names include SWAHILI and ENGLISH.

ACACIA LAHAI

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: red thorn

Local Names: melelek, ormelelek (ARUSHA, MASAI).
Potential Uses: building materials (*bomas*), charcoal, domestic uses (walking sticks), dye (bark = red), fencing (posts), firewood, gum, land improvement (nitrogen fixing).

ACACIA MELLIFERA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: black thorn, hook thorn

Local Names: oiti, eiti (ARUSHA, MASAI); mkambala, mvugala (GOGO); ghaland (GOROWA); yudegi, yudek (IRAQW); mangarada (MBUGWE); mujujumi (NYATURU); mkalankanga, kinwato (RANGI); murugara, mrugara (SUKUMA); msasa (ZIGUA).
Potential Uses: bee plant, building materials (termite resistant), domestic uses (pestles), fencing (live), firewood, fodder, land improvement (nitrogen fixing), medicine.

ACACIA NILOTICA

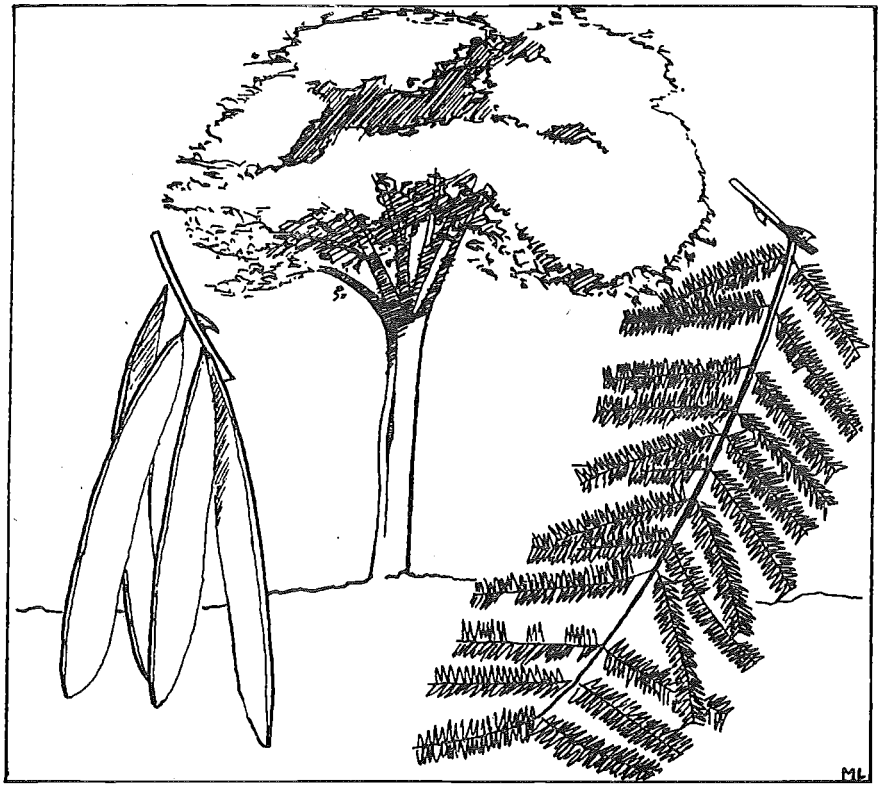
Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mgunga, scented thorn

Local Names: olkionite, olkiloriti, olgiloriti (ARUSHA, MASAI); baryomodi (ARUSHA, GOROWA, IRAQW); mgelegele, mgungankundumuela, muela, ngeregere (BONDEI, SHAMBAA, ZIGUA); mfuku, mnzasa (GOGO); muvulagavega (HEHE); katzi, kantzi, tsaqayand (IRAQW); barabonyoda (MBUGWE); mgunga, mdubilo (NYAMWEZI); muhinko (NYATURU); kihurgawisu, kijame (RANGI); afa (SANDAWI); mdubilo (SUKUMA); michame (ZANAKI); mgungankunda (ZIGUA).
Potential Uses: bee plant, beverage (bark), building materials (termite resistant), charcoal, domestic uses (needles, tools), dye (bark = black, red), fibre, firewood, fodder, gum, land improvement (nitrogen fixing), medicine, tannin.

ACACIA POLYACANTHA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mgunga, mkengewa, white thorn, falcon's claw acacia

Local Names: mdunga, mgunga (BONDEI, SHAMBAA, ZIGUA); miombwi (FIPA); muwindi (GOGO); fitismo (GOROWA); msukanzi (HEHE); amafughuni (GOROWA, IRAQW); mkuku, omugu (HAYA); mtopotopo (HEHE); muwindi (LUGURU); olasili (MASAI); mtonya, mwao (MATENGO); morufu (MBUGWE); mkwanga (MWERA); livindwe (NYAMWEZI); mukese (NYATURU); kimwato, kijame, mungurufa (RANGI); mugu (SUKUMA).
Potential Uses: domestic uses (tool handles), dye (heartwood), fencing (posts), firewood, fodder, gum, land improvement (nitrogen fixing, soil reclamation), medicine, salt, tannin (heartwood), timber (hard).



ACACIA POLYACANTHA

ACACIA SIEBERANA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mgunga, paperbark thorn

Local Names: munusi (HEHE); tahhumo (IRAQW); singiati (MBUGWE); isaumo, mwede (RANGI).
Potential Uses: bee plant, building materials (house poles), domestic uses (containers, spear shafts), firewood, fodder, medicine, tannin (pods), timber (soft).

. . . . . .

ACACIA TANGANYIKENSIS

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)

Local Names: mheme (GOGO).
Potential Uses: beehives, land improvement (windbreaks, soil, water conservation), musical instruments (drums), shade.

. . . . . .

ACACIA TORTILIS

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mgunga, mugunga, israel babool, umbrella thorn

Local Names: oldepesi, sanzavi, olerai (ARUSHA); honywam, harbanghed (BARBAIG); mkongoe (BONDEI, SHAMBAA, ZIGUA); mrimba, msawero (CHAGGA); mkungugu, mwaliganza (GOGO, HEHE); tsantsafi (GOROWA, IRAQW); harbagheidi, fitsitoo (IRAQW); muhare (JITA); olgorete, oldepasi, oldepesi (MASAI); moonga, movunga (MBUGWE); mgunga (IŞANZU, NYATURU, NYAMWEZI, PARE, SUKUMA); mugunga (NYATURU); muhunga (RANGI).
Potential Uses: beehives, bee plant, charcoal, domestic uses (tool handles, needles), dye (bark, roots = yellow, brown), fencing (live), fibre (rope), firewood, fodder, furniture, gum, land improvement (nitrogen fixing), shade, tannin.

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ACACIA XANTHOPHLOEA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: fever tree

Local Names: olerai, elerai (ARUSHA, MASAI); honywam (BARBAIG); aaray, nary (GOROWA); narmo, aari (IRAQW); mulera (ISANZU); locheda (MBUGWE); murya (NYATURU); mwerera (PARE); mweda (RANGI).
Potential Uses: building materials (*bomas*), fencing (live, posts), firewood, fodder, land improvement (nitrogen fixing), medicine.

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ADANSONIA DIGITATA

Family Name: BOMBACACEAE
Common Names: mbuyu, baobab

Local Names: muuyu (BONDEI, SHAMBAA, ZIGUA); mpela (GOGO); dakaumo (GOROWA); gandar-yandi (IRAQW); mpela (LUGURU); olmesera, olimisera (MASAI); mwuwiye (MBUGWE); mpela (NYAMWEZI); mramba (PARE); mwiwi (RANGI); gele (SANDAWI); mkondo (SANGU, HEHE); mwandu, mwanda, ng' wandu (SUKUMA).
Potential Uses: bee plant, beverage, domestic uses (water and food storage, trays), dye (bark, roots = red), fibre (cloth, rope, musical instrument strings), food (condiment), fruit, gum (glue), latex (coagulant), medicine, resin, salt, soap (bark, fruit), tannin (bark).

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AFZELIA QUANZENSIS

Family Name: CAESALPINIOIDEAE
Common Names: mambakofi, mbarika, mbembakofi, mkomge, mkongo, lucky bean

Local Names: ambakofi, mkomba, mkola (BONDEI, SHAMBAA, ZIGUA); mkora (BUNGU, LONGO, SUKUMA, NYAMWEZI, ZINZA); mkola (GOGO, LUGURU, ZINZA, SUKUMA, SUMBWA, NYAMWEZI, LONGO); mbarikwa (MATUMBI, MWERA); mgongoma (KISI, MATENGO, YAO); mkongo (RUFIJI); mtema (MWERA); mongarama (NGONI); mkomba (NGURU); mhora, kola (NYAMWEZI); bmkongo (PARE); mfunguji (SANGU, HEHE); nkola (SUKUMA); mkongo (ZARAMO); mukora (ZINZA).
Potential Uses: bee plant, building materials, charcoal, firewood, fodder, food, fruit, furniture, land improvement (nitrogen fixing), medicine, shade, timber (boats, cabinets; termite resistant).

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ALBIZIA GUMMIFERA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: peacock flower

Local Names: ol sanguuwezi, asangupesi (ARUSHA); masakta (BARBAIG); tsori (BARBAIG, GOROWA, IRAQW); mkenge, mazi (BONDEI); mkenge-mazi, mkenge-mchala (BONDEI, SHAMBAA, ZIGUA); mfuranje, mboromo, mduka, mfurangi, moisiranga, mruka (CHAGGA); sori, sahati (FIOME); msanga (GWENO); myenzeyenze (HAYA); sarai (IRAQW); mseveya (LONGO); mkenge (LUGURU); mtanga (MATENGO, YAO, FIPA); ol geturai, osangupesi (MASAI); mosironga (MBUGWE); mkengemaji (NGURU); msame (PARE); msaamaji (RANGI); mshai (SHAMBAA).
Potential Uses: beehives, bee plant, building materials, domestic uses (mortars, water troughs), firewood, fodder, land improvement (mulch, nitrogen fixing, soil stabilization), medicine, ritual, shade, timber (boats).

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ALBIZIA HARVEYI

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: sickle-leaved albizia

Local Names: olperelong'o (ARUSHA, MASAI); mkwagushashi, msisimisi (BONDEI, SHAMBAA, ZIGUA); mhogolo (GOGO, LUGURU); tuhalmo (GOROWA); tleharimo (GOROWA, IRAQW); msisina (HEHE); tlaheri (IRAQW); mfogolo (ISANZU); mkaransatu (LONGO); mazenzati (MATENGO, YAO); musisiviri, mfogolo (MBUGWE); mpogo, mufogoo (NYATURU); mpogolo (NYAMWEZI, SUKUMA, ZINZA); msisiviri (RANGI); mkami (SANGU, HEHE); mukaransatu (ZINZA).
Potential Uses: building materials (houses), charcoal, domestic uses (tool handles), fencing (live, posts), firewood, gum (called unala and sold in market in Dodoma), land improvement (nitrogen fixing), medicine, resin, shade, timber (termite resistant).

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ALBIZIA PETERSIANA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mkenge, many-stemmed albizia

Local Names: osanguoisi (ARUSHA); mkenge, mkenge-mayoya, mchala, mfueta, msolola (BONDEI, SHAMBAA, ZIGUA); osimihhi (GOROWA, IRAQW); osangupesi, sangupesi (MASAI); mosisiviri (MBUGWE); musisigulu (NYAMWEZI); musimihi (NYATURU); msaamaji (RANGI).
Potential Uses: building materials, domestic uses (tool handles), firewood, fodder, shade, timber.

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ALBIZIA SCHIMPERANA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mshai, mduka, forest long-podded albizia

Local Names: olsanguwesi (ARUSHA); mshai, mshai-mawe (BONDEI, SHAMBAA, ZIGUA); mfuruanga, mruka, mfuranje (CHAGGA); mchenje, mkenge-maji (GOGO); osangupesi, sangupesi (MASAI); mitanga (MATENGO, YAO); nduruka, nruka (MERU).
Potential Uses: building materials (termite resistant), charcoal, domestic uses (needles, tool handles), fibre, firewood, land improvement (nitrogen fixing), medicine, shade.

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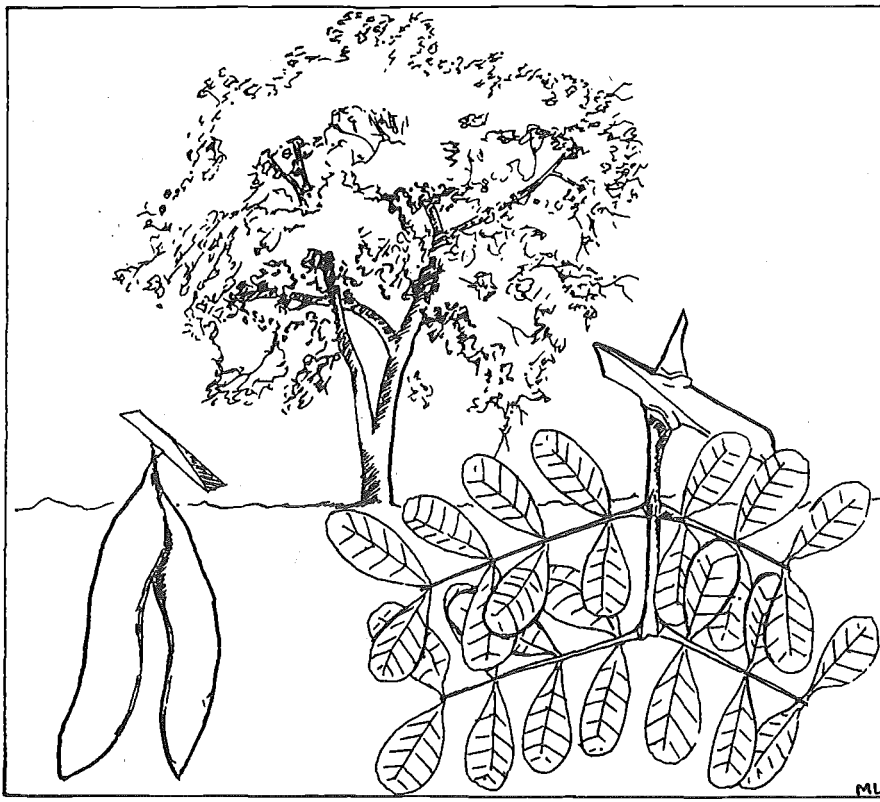

ALBIZIA VERSICOLOR

ALBIZIA VERSICOLOR

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mkenge

Local Names: mnyanza (LUGURU); mtulanzila (MATENGO); mkindwanzagamba (NYAMWEZI); mkinu (SHAMBAA); mkingu (ZIGUA).
Potential Uses: beehives, charcoal, domestic uses, firewood, land improvement (nitrogen fixing), timber.

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ALLANBLACKIA STUHLMANNII

Family Name: GUTTIFERAE
Common Names: mkanye, mwaka, mshambo

Local Names: mkamye, msambu (BONDEI, SHAMBAA, ZIGUA); mkanya, mkange, mkangi (SHAMBAA); msambu, msambo (SHAMBAA, NGURU); mkani, mkange (LUGURU); msambu-mbwiti (ZIGUA).
Potential Uses: dye, food (condiment), lighting, oil (food, liniment), timber.

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ANNONA SENEGALENSIS (A. CHRYSOPHYLLA)

Family Name: ANNONACEAE
Common Names: mchekwa, mtope tope, wild custard apple, wild soursop

Local Names: mfila (BENDE); mtonkwe (BONDEI, SHAMBAA, ZIGUA); mtomoko, mrisirisi (CHAGGA); msasa (LONGO); mtopetope (MATENGO, YAO, RUFIJI); mfila, mtopetope, mtela, mkonola (NYAMWEZI); mbokwe (SHAMBAA); tope-tope (ZARAMO); mkonyo (ZINZA).
Potential Uses: domestic uses (tool handles), dye (bark = yellow), firewood, fodder, fruit, medicine, shade.

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AZANZA GARCKEANA

Family Name: MALVACEAE
Common Names: snot apple, tree hibiscus

Local Names: emotoo (ARUSHA); mtobo (BENDE); mchai, matwa, mtoyo (GOGO); thogi, tlaghy (GOROWA); laghay (GOROWA, IRAQW); mtoyo, mtowo (HEHE); haghaiy (IRAQW); mutogo (KIMBU); emoloo, ormatoo (MASAI); mutago, mutogo (MBUGWE); mtovo, mutobo (NYAMWEZI); mtoo (NYASA); murogho, mutrogho (NYATURU); mtogho (NYIRAMBA); mtwa, mtula, msembere (RANGI); dong, xaxabo (SANDAWI).
Potential Uses: building materials (small uses), domestic uses (spoons, walking sticks, tool handles, bows), fibre (rope), fodder, food (masai soup), fruit, land improvement (green manure, mulch).

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BALANITES AEGYPTIACA

Family Name: BALANITACEAE
Common Names: desert date

Local Names: olng'oswa (ARUSHA, MASAI); muwambangoma (BONDEI, SHAMBAA, ZIGUA, GOGO); mohoromo (CHAGGA); hai (GOROWA); ganyamda, hawi (GOROWA, IRAQW, BARBAIG); mkisingo (HEHE); hotlimo (IRAQW); mudugunga (ISANZU); muruguya (LONGO); mkongo (LUGURU); ganyamda (MANG'ATI); mdore (MBUGWE); mkonga (NGURU); mbambang'oma, muvambang'oma, mduguyu (NYAMWEZI); mfughuyu (NYATURU); mjijiva, nyijiva, kivambang'ombe (RANGI); mjirya (SONJO); nyuguyu, myuguyugu (SUKUMA); muruguyu (SUMBWA, ZINZA).
Potential Uses: building materials, domestic uses (tool handles, spoons), firewood, fencing (live), fodder, food (oil), fruit, furniture, gum, land improvement (mulch, nitrogen fixing, windbreaks), medicine, poison, ritual, shade, timber.

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BERCHEMIA DISCOLOR

Family Name: RHAMNACEAE
Common Names: mnago, wild almond

Local Names: mgandu (GOGO); nyahumbu (POGORO); mkuni (NYAMWEZI); okoo (SANDAWI).
Potential Uses: bee plant, beverage (tea), building materials, domestic uses (combs, gun making, ladders, pestles), dye (roots = black; bark, wood = brown; bark = red), fodder, fruit, furniture, land improvement (windbreaks), resin, timber.

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BOSCIA MOSSAMBICENSIS

Family Name: CAPPARACEAE
Common Names: broad leaved boscia

Local Names: nasichand (BARBAIG, IRAQW); sangetmo, tlangetimo (GOROWA); muwisa (HEHE); mosingisi (MBUGWE); msulula (NYAMWEZI); msingisa (RANGI).
Potential Uses: building materials, firewood, fruit, medicine.

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BRACHYSTEGIA BOEHMII

Family Name: LEGUMINOSAE (SUBFAMILY CAESALPINIOIDEAE)
Common Names: myenze, myombo

Local Names: muyombo (BONDEI, SHAMBAA, ZIGUA); muyere (BENDE); nafumo (GOROWA, IRAQW); mnyenzi (LONGO); myenze (LUGURU); myombo (MATENGO, YAO); mfumbu (NYATURU); myenze, myombo (NYAMWEZI, SUKUMA).
Potential Uses: beehives, bee plant, charcoal, fibre (rope), firewood, tannin.

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BRACHYSTEGIA BUSSEI

Family Name: LEGUMINOSAE (SUBFAMILY CAESALPINIOIDEAE)
Common Names: mionbo

Local Names: mtelela (HEHE); mgelegele, mtindiyombo, myombo (MATENGO, YAO); mjerijeri (MWERA); mkongolo (NYAMWEZI); msane (NYIKA); mhangala (ZIGUA, RANGI).
Potential Uses: beehives, bee plant, charcoal, domestic uses (tools), fibre (rope), firewood, medicine, timber.

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BRACHYSTEGIA SPICIFORMIS

Family Name: LEGUMINOSAE (SUBFAMILY CAESALPINIOIDEAE)
Common Names: mtundu, mrihi, mriti, myombo

Local Names: muyombo, mtondolo (BONDEI, SHAMBAA, ZIGUA); mzombo (FIPA); mguji, mhangala, mriti, mtondote (GOGO); nafumo (GOROWA, IRAQW); mkwe (HEHE); mundu (LONGO); myombo, mzombo, mpapa (MATENGO,YAO); mkuti, muguti (NYAKYUSA); mtundu (NYAMWEZI, LONGO, LUGURU); msewe, mzimdiwi (NYIHA); mhangala (RANGI); luterewe (SANGU); ndagula (SANGU, HEHE); miyombo (SUKUMA); mtundu (SUMBWA).
Potential Uses: beehives, bee plant, charcoal, domestic uses (water containers, storage pots), dye (bark=black), fibre (rope), firewood, fodder, land improvement (mulch, nitrogen fixing), medicine, shade, tannin (bark 6 to 13%), timber (boats).

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BREONADIA SALICINA (ADINA MICROCEPHALA)

Family Name: RUBIACEAE
Common Names: mgwina, adina

Local Names: mdogowe (BONDEI, SHAMBAA, ZIGUA); mgwina (MATENGO, YAO).
Potential Uses: building materials, domestic uses, firewood, furniture, medicine, shade, timber (boats; heavy, termite resistant).

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BRIDELIA MICRANTHA

Family Name: EUPHORBIACEAE
Common Names: mkarati, mwiza

Local Names: mwiza, muiza, mwisa, mkarakata, mkolakola (BONDEI, SHAMBAA, ZIGUA); mwaru, monde, marie (CHAGGA); munyamaji, mlangali (FIPA); isalmo (GOROWA, IRAQW); mukuwe, mshamako, mwesa (HAYA); isaimo (IRAQW); mwiwa-nonya (LONGO); msumba (LUGURU); mayenda (MATENGO, YAO); mkolakole (NGURU); mwisya (NYAKYUSA); sengamino (NYIHA); msopa, munyeraminzi (TAN); mwiza (VIDUNDA); muesa, mweza (ZIGUA); mututututu (Zanzibar); msamiko (ZINZA).
Potential Uses: building materials, charcoal, domestic uses (tool handles, bows), dye (bark = black; twigs = red), firewood, fruit, furniture, medicine, resin (basket sealer), shade, tannin (bark), timber (boats; hard, termite resistant).

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BURKEA AFRICANA

Family Name: LEGUMINOSAE (SUBFAMILY CAESALPINIOIDEAE)
Common Names: wild syringa, mgandomkarati, burkea

Local Names: mkarati (HEHE); mgandu (LONGO); mgando, mkalati (LUGURU); mpukupuku (MATENGO, YAO); mgando, mugando mkalati, mgando mkalati (NYAMWEZI); kaimbi (RANGI); msangala (SANGU, HEHE).
Potential Uses: building materials, charcoal, domestic uses (tool handles), fibre (chew sticks), firewood, fodder, furniture, gum, land improvement (nitrogen fixing), medicine, shade, tannin, timber (heavy).

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CASSIPOUREA MALOSANA

Family Name: RHIZOPHORACEAE

Local Names: akabajan (BARBAIG); msengela (HEHE); funtsari (IRAQW); alaiseleki, osonjoi (MASAI).
Potential Uses: building materials, domestic uses (tool handles), timber.

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COMBRETUM ADENOGONIUM
(C. FRAGRANS, C. GHASALENSE, C. TERNIFOLIUM, C. TETRAPHYLLUM)

Family Name: COMBRETACEAE
Common Names: mlama

Local Names: mbadilo (HEHE); mlama, chinama (MATENGO, YAO); muluzyaminzi (NYAMWEZI).
Potential Uses: building materials, charcoal, firewood, food, medicine, shade.

COMBRETUM LONGISPICATUM (C. SPICATA)

Family Name: COMBRETACEAE
Common Names: mlama

Local Names: mgombogombo (GOGO).
Potential Uses: bee plant, land improvement (windbreaks, soil and water conservation), medicine, musical instruments (guitar), resin (chewing gum), shade.

COMBRETUM MOLLE (C. ATELANTHUM, C. GUEINZII, C. HOLOSERICEUM)

Family Name: COMBRETACEAE
Common Names: mlama, mgururo

Local Names: maroro, maroi, olbukoi (ARUSHA); gendai (BARBAIG, IRAQW); mlama (BENDE, LUGURU, NYAMWEZI, VIDUNDA); naganagachan (BARBAIG); mototi (GOROWA); gendamo (GOROWA, IRAQW, FIOME); mulama (HAYA, RANGI, ISANZU, NYATURU); gindamo (IRAQW); mjarujaru, mtibari (LONGO); mlama, mlama mwenge (LUGURU); tetekuriru, mbugwe, olmaroroi (MASAI); mlama, mdama (MATENGO, YAO); mlamadoli (NGURU); mruku (PARE); mgiito (RANGI); mnama (SHAMBAA); kaguwa, namamwela (SUKUMA); mugombwa (ZINZA).
Potential Uses: bee plant, building materials (termite resistant), charcoal, domestic uses (tool handles), fencing (posts), fodder, land improvement (mulch), medicine (human, animal), shade.

COMBRETUM ZEYHERI

Family Name: COMBRETACEAE
Common Names: mlama, msana

Local Names: olmaroroi (ARUSHA, MASAI); geta-reri (BARBAIG, GOROWA); mlama-we-ng'ala (BONDEI, SHAMBAA, ZIGUA); mototi, amagendai (GOROWA, IRAQW); mlelega (GOGO); gendai, gendumo (IRAQW); gendai (MASAI); teteko, iteleko (MBUGWE); msana (NYAMWEZI, NYATURU, SUKUMA); muhanyati (NYATURU); iteteko (RANGI); mlama (SANGU, HEHE); nsana (SUKUMA).
Potential Uses: building materials, fibre (roots-baskets), firewood, medicine, timber (soft, borer, termite proof).

COMMIPHORA AFRICANA (C. PILOSA)

Family Name: BURSERACEAE
Common Names: mponda, mturituri, mtwitwi

Local Names: osilalei (ARUSHA); naamo (BARBAIG, IRAQW); siponda (BENDE); mtuntwi, mtelwa (BONDEI, SHAMBAA, ZIGUA); msomvugo (GOGO); niimo (IRAQW, GOROWA); bakchandi, neemo (IRAQW); muzuhu (ISANZU); tundulu (MBUGWE); msagasi (NYAMWEZI); mujuhu (NYATURU); idaki, ijovya (RANGI); mawezi, mamezi (ZINZA).
Potential Uses: beehives, beverage (tea), building materials, domestic uses (spoons, tool handles, water troughs), dye (bark = red, brown), fencing (live, posts), firewood, fodder, food (oil), fruit, gum, insecticide, medicine, musical instruments, resin.

COMMIPHORA EMINII (SUBS. ZIMMERMANNII)

Family Name: BURSERACEAE
Common Names: mponda

Local Names: mgombogombo (GOGO); madawiri (GOROWA); naamo, niimo (IRAQW); mwamba ngoma (LONGO); itonto (RANGI); mgo'ngo'ngo'ngo, (SUKUMA).
Potential Uses: beehives, building materials, fencing (posts, live), firewood, fodder, furniture, land improvement (erosion control), medicine, resin, shade.

COMMIPHORA MOLLIS (C. STUHLMANNII)

Family Name: BURSERACEAE
Common Names: mponda

Local Names: mkongolo (GOGO).
Potential Uses: beehives, crafts, domestic uses (tool handles, spoons), furniture, timber.

COMMIPHORA TROTHAE

Family Name: BURSERACEAE
Common Names: mponda

Local Names: osilalei (MASAI).
Potential Uses: domestic uses (mortars, pestles, spoons), furniture (boxes), medicine.

COMMIPHORA UGOGOENSIS

Family Name: BURSERACEAE
Common Names: mponda

Local Names: mdachi (GOGO); mkongolo (HEHE); mponda, msusu (NYAMWEZI); mtono (SANGU, HEHE); mususu-nsusu, msusu (SUKUMA).
Potential Uses: beehives, bee plant, building materials, domestic uses (tool handles, spoons), furniture (local chairs), gum, shade.

CORDIA AFRICANA (C. ABYSSINICA)

Family Name: BORAGINACEAE
Common Names: mringaringa, mukumari, east african cordia

Local Names: mkibu (BENDE); mfufu, mzinga-zinga (BONDEI, SHAMBAA, ZIGUA); mringaringa (CHAGGA, MERU); sei (IRAQW, GOROWA); msinzizi, mbapu (LUGURU); mhyenya (MATENGO, YAO); mringaringa (MERU); musingati (NYIHA).
Potential Uses: beehives, bee plant, building materials, domestic uses (tool handles, mortars, utensils, water containers), fibre, firewood, fruit, furniture, gum (glue), land improvement (nitrogen fixing), medicine, shade (coffee), timber.

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CORDIA SINENSIS (C. GHARAF, C. ROTHII)

Family Name: BORAGINACEAE
Common Names: nyamate

Local Names: baghalmo-lambi (FIOME); mdavi, mdawisogwe, mdawi (GOGO); hanarmo (GOROWA); bagharimo (IRAQW); ol durgo, ol durogo (MASAI); mochocho (MBUGWE); mdumwa-kingu (NYATURU); mhololo (PARE); mnembu (RANGI).
Potential Uses: beehives, bee plant, building materials (roofs of local houses), domestic uses (clubs, tool handles, walking sticks), fibre, firewood, fodder, fruit, furniture (stools), gum, medicine, ritual.

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CROTON MACROSTACHYUS

Family Name: EUPHORBIACEAE
Common Names: broad leaved croton

Local Names: ololyapiyapi, olobiago (ARUSHA); liwurungu (BENA); mshunduzi (BONDEI, SHAMBAA, ZIGUA); mfurufuru, ifurufuru (CHAGGA); mzululwa (FIPA); meali, melia (GOROWA); mulugu, mulemugu, muhugu, muulungu (HEHE); msuju (KURIA); ololiapo, oloiyapiyap (MASAI); mfofuru, mfurfuru (MERU); mkurungu, mukuruguru, mulemugu (NYIHA); livuluku (PANGWA); liwulugu (SAFWA); mshunduzi (SHAMBAA); muhuwa (ZINZA).
Potential Uses: beehives, bee plant, building materials, domestic uses (tool handles), firewood, fodder, land improvement (mulch, soil conservation), medicine (insect repellant), ritual, shade.

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CROTON MEGALOCARPUS

Family Name: EUPHORBIACEAE
Common Names: musine, croton

Local Names: mbali, lali, mlalai, mlandee, mnyaki, mwajaji, mergentu, lalei (CHAGGA); melia, meali (GOROWA); muhihi (HAYA); nziloi, eiloi, ziloi (IRAQW); ol mergoit, ol margait, ol marbait, olmarubai (MASAI); mhande (MATENGO, YAO); marabai (MERU); muhande (PARE).
Potential Uses: bee plant, building materials, fencing (live, posts), firewood, fodder, land improvement (mulch, green manure), medicine, shade.

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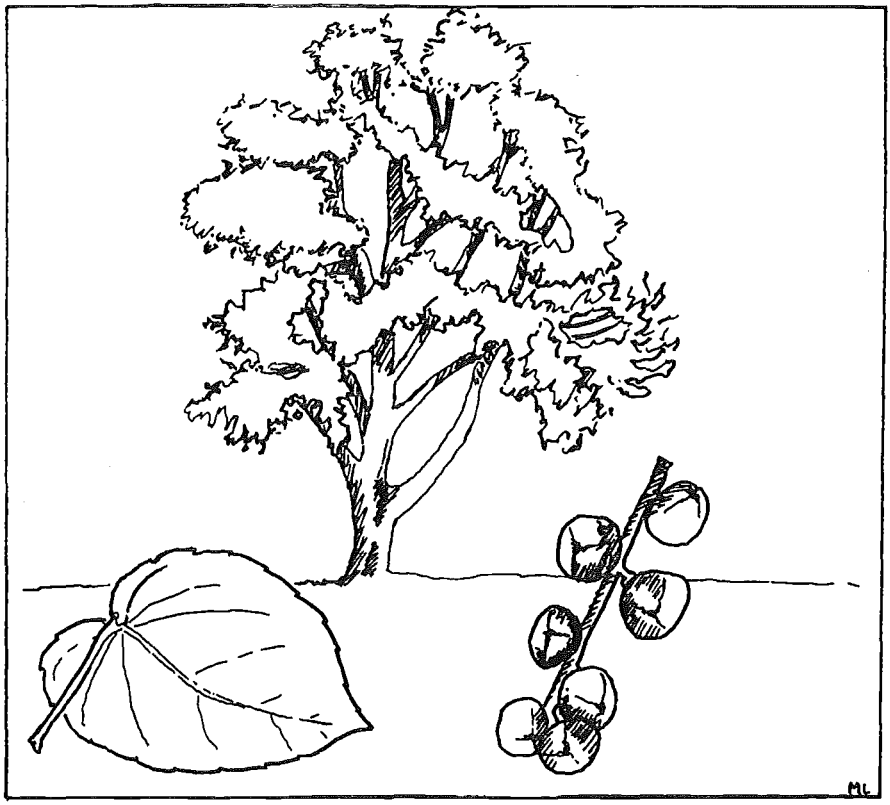

CROTON MACROSTACHYUS

DALBERGIA ARBUTIFOLIA

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: mjiha

Local Names: mjiha (GOGO); warambu, menday (IRAQW); musungua (NYATURU).
Potential Uses: building materials (termite, beetle resistant), crafts, charcoal, domestic uses (tool handles, walking sticks, mortars, spoons), firewood, medicine.

DALBERGIA MELANOXYLON

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: mpingo, poyi, african blackwood, zebra wood

Local Names: oitlaska, oltiaska (ARUSHA, MASAI); masojanda (BARBAIG); mhingo (LUGURU, NGURU, BONDEI, SHAMBAA, ZIGUA); kidamo, kinti (CHAGGA); mpingo, mhingo, q'oya (GOGO); nyamfunza, nyamfunga (LONGO, RANGI); endisika (MASAI); mwajinde (MBUGWE); mgembya, mgembe (NYAMWEZI, SUKUMA); mupako (NYATURU); minday, nyamfunza, tamumo mhembete (RANGI); gembe, ngembi (SUKUMA); mpingo (VIDUNDA, MWERA); mgembya (ZINZA).
Potential Uses: beehives, building materials (hard, ant, beetle proof), crafts, domestic uses (clubs, hammers, spears, sticks), dye (heartwood = red), fodder, land improvement (green manure, mulch, nitrogen fixing), medicine, musical instruments.

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DALBERGIA NITIDULA

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: kafinulambasa

Local Names: mhuga (BONDEI, SHAMBAA, ZIGUA, NGURU); mjiha (GOGO); guadi (GOROWA, IRAQW); mwoma (LONGO); lungwe, unhungu (MATENGO, YAO); kafinulambasa, mbelambasa, kapondalambasa (NYAMWEZI); mobibi (NYATURU); munjeja (RANGI); msinantemo (SANGU); monya, mwoma (ZINZA).
Potential Uses: building materials, charcoal, domestic uses (mortars, pestles, tool handles, walking sticks), dye (bark, roots = red; bark = yellow), firewood, fodder, medicine.

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DICHROSTACHYS CINEREA (D. GLOMERATA, D. NYASSANA)

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: mkulajembe, sickle bush

Local Names: endundulu (ARUSHA, MASAI); mutundurunt, mtundarai (BARBAIG, IRAQW); kikulagembe, mkeragembe, mchelegembe (BONDEI, SHAMBAA, ZIGUA); mwingano (CHAGGA); ksimjulu, mpangala (FIPA); mdaberi, dabiri (RANGI); girwangw, girwal (GOROWA, IRAQW); gewawu (GOROWA); mgelele (HEHE); mtundulu (ISANZU, GOGO, LUGURU, NYAMWEZI, SUKUMA); mtunduru (LONGO, NGURU); msawanyama (LONGO, ZINZA); chingunguti (MATENGO, YAO); mutundu (NYATURU); mukalakanga (MBUGWE); mukeregembe (NGURU); muvuluvulu (SUMBWA); mkeragembe (ZIGUA); museruwantyasa (ZINZA).
Potential Uses: bee plant, building materials (*bomas*), charcoal, domestic uses (tool handles), fencing (live, posts), fibre, firewood, fodder, land improvement (nitrogen fixing, soil conservation), medicine.

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DIOSPYROS KIRKII

Family Name: EBENACEAE
Common Names: ebony

Local Names: mfurata (LUGURU); mng'akora (MWERA); mnumbulu (NYAMWEZI); mkokokivu (VIDUNDA).
Potential Uses: domestic uses (tool handles, gun making), firewood, fruit, shade.

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DIOSPYROS MESPILIFORMIS

Family Name: EBENACEAE
Common Names: mgiriti, african ebony

Local Names: msinde (BENDE, CHAGGA); mhukwi, mkulwie, mgirite, mgodogodo (BONDEI, SHAMBAA, ZIGUA); mkadi, mkuare (CHAGGA); mtitu, msindangurwe, msinde (LUGURU); nzakala we mwana (MATENGO); mtitu (LUGURU); msinde, mkinde (NYAMWEZI); mjongolo (PARE); mkoko (VIDUNDA).
Potential Uses: bee plant, beverage, building materials, crafts, charcoal, domestic uses (gun stocks, tool handles), dye (bark = blue), firewood, fruit, furniture, land improvement (mulch, nitrogen fixing), medicine, shade, timber.

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ENTADA ABYSSINICA

Family Name: LEGUMINOSAE (SUBFAMILY MIMOSOIDEAE)
Common Names: tree entada

Local Names: mubundu (BENDE); mfufuma-simba (BONDEI, SHAMBAA, ZIGUA); arei-desu (GOROWA); mugelagela (HEHE); msaningala (ISANZU); msarwa (KURIA); mwegambura, miganzula (LONGO); mvulambula (LUGURU); mtangati, mzenzati, munzati (MATENGO, YAO); mfutambula (NYAMWEZI); ijwejwe (RANGI); musangisangi (ZINZA).
Potential Uses: domestic uses (grave markers), firewood, fodder, land improvement (mulch, nitrogen fixing), medicine, ritual (rainmaking), salt, shade, soap.

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ERYTHRINA ABYSSINICA (E. TOMENTOSA)

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: muhuti, mwamba-ngoma, kaffir boom, lucky bean tree, red-hot-poker tree

Local Names: olowani (ARUSHA); manenei (BARBAIG); mbeko (BENDE); mlungu-magoma, mlungu-matumbi, mulugu (BONDEI, SHAMBAA, ZIGUA); mrin (CHAGGA); mtiti (FIPA); mbilimisi (GOGO); mlinzi (HAYA); angal qanguzi, quanquan, quanquzi (IRAQW); mlenzi (KEREWE); mulinzi (LONGO); olngaboli, oloboni (MASAI); mheveheve (MATENGO, YAO); mhalalwa-huba (NYAMWEZI, SUKUMA); msiviti (NYATURU); kichumbichumbi (RANGI); muhemi (SANGU, HEHE); murungu (SHAMBAA); mpilipili, mkalalwanghuba, mungu (SUKUMA).
Potential Uses: beehives, bee plant, building materials, crafts (toys, drums, necklaces), domestic uses (pestles, mortars, cork for fishnets), dye (roots = red; bark = brown), firewood, land improvement (nitrogen fixing, mulch, soil conservation), medicine, ritual, shade.

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EUCLEA DIVINORUM

Family Name: EBENACEAE
Common Names: mdaa, magic quarri

Local Names: osojoo, olkoinye (ARUSHA, MASAI); iwuruka, mkenge (CHAGGA); sinyanyi (GOROWA, IRAQW); musikizi (HAYA); mhimbachigulu, mhekele, mauhekere (HEHE); minighit, furusinya-nyi, furufinyi (IRAQW); mhekele, mhimbachigulu (KAGURU); ikeng, ekeni (MERU); mudaa (NYATURU); mbanjiru (RANGI); mdaa, mdala (SHAMBAA).
Potential Uses: building materials, dye (bark = brown), fibre (toothbrushes), firewood, food, fruit, furniture (hard wood), ink (fruit = purple), medicine.

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EUPHORBIA CANDELABRUM

Family Name: EUPHORBIACEAE
Common Names: candelabra tree

Local Names: mwasa, kimbuti (BONDEI, SHAMBAA, ZIGUA); mnangali (GOGO); athang (GOROWA, IRAQW); mlangali (HEHE, NYAMWEZI, SUKUMA); mwaisonga (MBUGWE); mlangale (NYAMWEZI, SUKUMA); mwasa (RANGI); mwandu (SUKUMU).
Potential Uses: fencing (live), musical instruments (drums), ritual, shade.

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EUPHORBIA TIRUCALLI

Family Name: EUPHORBIACEAE
Common Names: malangali, mchakaazi, utupa, utupa mwasi, rubber hedge euphorbia

Local Names: sapu (BONDEI, SHAMBAA, ZIGUA); manyala (GOGO, HEHE, LUGURU); mnara (GOGO); mulwaghai, mulahay (GOROWA, IRAQW); manyori, mluhhi (IRAQW); manyara (LONGO, GOGO); kigomvu (LUGURU); oloile, ol aile (MASAI); munyaa, mulughwai, muluhhay (NYATURU); luwondu, mnyala (RANGI); mgofu (SANGU, HEHE); mnala, inala, munyala, mhunga shalo (SUKUMA); manyara (SUMBWA); kibaranga (ZIGUA); mnyara, mangara (ZINZA).
Potential Uses: fencing (live), gum (glue = used to catch birds), land improvement (soil conservation, windbreaks), medicine (insect repellant - ants), poison (bird, fish, arrow).

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FAUREA SALIGNA

Family Name: PROTEACEAE
Common Names: beechwood

Local Names: dakta, ol garian (ARUSHA); msisi (BONDEI, SHAMBAA, ZIGUA); mfuka, mudi (CHAGGA); msega (FIPA); dukti (GOROWA, IRAQW); mhenyi, mwemba (HEHE); behetoh, kakta (IRAQW); mwenba, mhenyi (KAGURU); sense (SAFWA); sese, nsese (KONDE); mteteleka (MATENGO, YAO); msize mgosi (SHAMBAA).
Potential Uses: beehives, bee plant, charcoal, domestic uses (tool handles), dye (bark, leaves = red), firewood, furniture, land improvement (windbreaks), medicine, ritual, timber (hard).

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FICUS SYCOMORUS (F. GNAPHALOCARPA, F. MUCOSA)

Family Name: MORACEAE
Common Names: mkuyu, sycamore fig

Local Names: mkuyu (BONDEI, SHAMBAA, ZIGUA, GOGO, MATENGO, YAO, RANGI, NYAMWEZI); olngaboli (ARUSHA); antsi (BARBAIG, GOROWA, IRAQW); kuyu (FIOME); mukuyu (RANGI, NYATURU); mkunyu (LONGO); ol nanboli, ol gnangobli, ol mangulai (MASAI); mkuyu (NYAMWEZI); saklana (SANDAWI); njombe (SANGU, HEHE); mkuju (ZARAMO).
Potential Use: beehives, bee plant, fencing (live), fodder, food, fruit, firewood, land improvement (mulch, soil and water conservation), medicine, ritual, shade, timber.

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FICUS THONNINGII (F. NATALENSIS)

Family Name: MORACEAE
Common Names: mrumbapori, mtschamwa, common wild fig, strangler fig

Local Names: mvumo, mwumo (BONDEI, SHAMBAA, ZIGUA); mkuu (CHAGGA); mlumba (GOGO); munyam-wonyu, mtoma mtenza, mshasha (SUBI); tiita (FIOME); mugumo (KIMBU); ndola (KONDE); oreteti (MASAI); mlandoge (NGONI); mlumba (NYAMWEZI); mugumo-wa-ntwike (NYIRAMBA); mumu-muzura (RANGI); muwomo (SHAMBAA).
Potential Uses: beverage (local beer), fencing (live), fibre (rope), fire starter, fodder, glue (latex), gum, land improvement (mulch, soil and water conservation, windbreaks), medicine, ritual, shade.

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FICUS VALLIS-CHOUDAE

Family Name: MORACEAE

Local Names: olng'aboli (ARUSHA); mkuyu-mpeho (BONDEI, SHAMBAA, ZIGUA); mkuuyu (CHAGGA); mkuju (GOGO, NYAKYUSA); ikuu (MERU); mkuyu (SHAMBAA).
Potential Uses: bee plant, firewood, land improvement (soil and water conservation), shade.

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FLACOURTIA INDICA (GMELINA INDICA)

Family Name: FLACOURTIACEAE
Common Names: mkingila, mchongoma, ngovigovi, mgo, indian plum

Local Names: msungu (BENDE); mchongoma (BONDEI, SHAMBAA, ZIGUA, HEHE); msambuchi (CHAGGA); mnyondoiya (DIGO); mwanga (FIPA); tsapenai (GOROWA); mgola (HEHE, ZIGUA); sokhaimo (IRAQW); mrambuohi (KAGURU); mgora (LUGURU); mbilupili, mng'unga (MATENGO); staswa, mtaswa, mtawa (MWERA, RUFIJI); msingila, mpuguswa (NYAMWEZI); musingisa (NYATURU); olleleroi (Masai); mtundukarya (RANGI); mlukua mhuli, puguswa (SUKUMA); msugussu, msungusu (ZINZA).
Potential Uses: domestic uses (tool handles), fodder, fruit, firewood, medicine, tannin (bark), timber.

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GREWIA BICOLOR

Family Name: TILIACEAE
Common Names: false brandybush

Local Names: mkole (BENDE, GOGO, LUGURU, ZARAMO); mkole-ngoda (BONDEI, SHAMBAA, ZIGUA); lomo (GOROWA, IRAQW); mkomakoma (HA, HAYA, ZINZA); lagangi, lagaang-aawak (IRAQW); esitete, osiminde, os siteti (MASAI); musuna-nu-kuu (MBUGWE, NYATURU); mkomalendi, mkoma (NYAMWEZI); mduwau, mfuwau (RANGI); mswere (RUFIJI); doo' (SANDAWI); mperemehe (SANGU, HEHE); mukoma, mkoma (SUKUMA); mkole mweupe (ZARAMO).
Potential Uses: bee plant, building materials, domestic uses (arrows, bows, spoons, tool handles, walking sticks), fibre (rope), firewood, fodder, food, fruit, medicine, ritual, shade, soap (leaves = sapon).

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GREWIA MOLLIS

Family Name: TILIACEAE

Local Names: ositeti (ARUSHA, MASAI); lomo (GOROWA, IRAQW); lagangi, lagagir-daat (IRAQW); mukoma (NYAMWEZI, SUMBWA); musuma (NYATURU); mkomakoma (RULI); mdaguata (SUKUMA).
Potential Uses: bee plant, beverage, fibre (rope), medicine, salt.

GREWIA PLATYCLADA

Family Name: TILIACEAE

Local Names: olmangulai-oloing'oni (ARUSHA, MASAI); mpelemehe (GOGO); lomo-peh (GOROWA); firaakwi (GOROWA,IRAQW); hawata, ududoguta (IRAQW); mpelemense (NYAMWEZI); iperemesi (RANGI); mbajua (SANGU, HEHE); mperemezi, mpelemese (SUKUMA).
Potential Uses: bee plant, building materials (doors), firewood, fodder, fruit, medicine.

HAGENIA ABYSSINICA (H. ANTHELMINTICA)

Family Name: ROSACEAE
Common Names: mlozilozi, hagenia

Local Names: ol kijabe, lengijabe, alchani-lengai (ARUSHA); mfoono (BENA); mrozirozi (BONDEI, SHAMBAA, ZIGUA); mwanga, mwalanga, ihanga, mlanga, mlaagi (CHAGGA); mweretsi, mweretzi (HEHE); ihangala (LONGO); songejaye, alchani-lengai, ngivavi (MASAI); mlanga (MERU); mtulenya, mturungu (NYAKYUSA); lifuwuna (PANGWA); mkumburu (SAFWA); luziluzi, mrosirose (SHAMBAA).
Potential Uses: bee plant, building materials, crafts, dye (bark, wood=red; bark, wood=yellow) firewood, land improvement (mulch, soil conservation, firebreaks), medicine, timber.

ILEX MITIS

Family Name: AQUIFOLIACEAE
Common Names: african holly

Local Names: genda-na-mto (BONDEI, SHAMBAA, ZIGUA); masi (CHAGGA); mamparoi (IRAQW); mgambo (MATENGO, YAO); sengati (NYIHA); saangati (SAFWA).
Potential Uses: building materials, firewood, fruit, medicine (healing wounds), shade, soap.

JULBERNARDIA GLOBIFLORA

Family Name: LEGUMINOSAE (SUBFAMILY CAESALPINIOIDEAE)
Common Names: muwa

Local Names: mhangala, mtondoro (BONDEI, SHAMBAA, ZIGUA); msima (FIPA); mguji, musina (GOGO); mpimati, mukata (HEHE); hewasi (IRAQW); muva (LUGURU); mchenga (MATENGO, YAO); muva, muba (NYAMWEZI); mtata (RANGI).
Potential Uses: bee plant, charcoal, dye (bark = brown; bark soaked in mud = black;), fibre (rope), firewood, land improvement (nitrogen fixing), medicine.

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JUNIPERUS PROCERA

Family Name: CUPRESSACEAE
Common Names: mwangati, african pencil cedar

Local Names: ol darakwa, ol tarakwa (ARUSHA, MASAI); semit (BARBAIG); mwangati, mlalo, mbalu (BONDEI, SHAMBAA, ZIGUA); mdrawaka, mtarakwa, nderakwa, nso (CHAGGA); mselemuka, mbechera, mselemko (KINGA); altarakwai, oltatakwai (MASAI); nderakwa, msingo (MERU); selemuka (NYAKYUSA, WANJI); mselemuka, noge (WANJI).
Potential Uses: beehives, building materials, fencing (posts), land improvement (shade, windbreaks), medicine, pencils, timber (termite resistant).

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KHAYA ANTHOTHECA (K. NYASICA)

Family Name: MELIACEAE
Common Names: mkangazi, african mahogany, red mahogany

Local Names: mbogwa, mkangazi, ntondoo, mtondoo (BONDEI, SHAMBAA, ZIGUA); mtembo (FIPA); myofu (HA); mhebi (HEHE); mkangazi (LUGURU, VIDUNDA); nyaelasi, ilulu (NYAKYUSA); muwawa (MATENGO, YAO); mbogwa (NGURU); mbulu (NYIHA); mwawa (POGORO).
Potential Uses: building materials (flooring), dye (bark = red, brown), firewood, furniture, land improvement (windbreaks), medicine, shade, timber (boats; hard, termite, borer resistant).

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KIGELIA AFRICANA (K. AETHIOPICA)

Family Name: BIGNONIACEAE
Common Names: mwegea, sausage tree

Local Names: ol darboi, oldaboi (ARUSHA, MASAI); melegea (BONDEI); nzungwa (FIPA); mkenka (GOGO); datei (GOROWA); mzengute, mugunguti (HAYA); mangafi (IRAQW); mulunzi (ISANZU); msunguti (LONGO); muegea (LUGURU); mosofwa (MBUGWE); mtandi (MWERA); mvungwe (NGURU); msanghwa, mvungwa (NYAMWEZI); mungungu (NYATURU); musuva (RANGI); myigeya (RUFIJI); mfumbi (SANGU, HEHE); mwicha, ngwicha (SUKUMA); mdungwa, mvungwe (ZIGUA); mzingute (ZINZA).
Potential Uses: bee plant, beverage (beer), domestic uses (tool handles), dye (fruit = black), firewood, food, fruit, land improvement, medicine, ritual.

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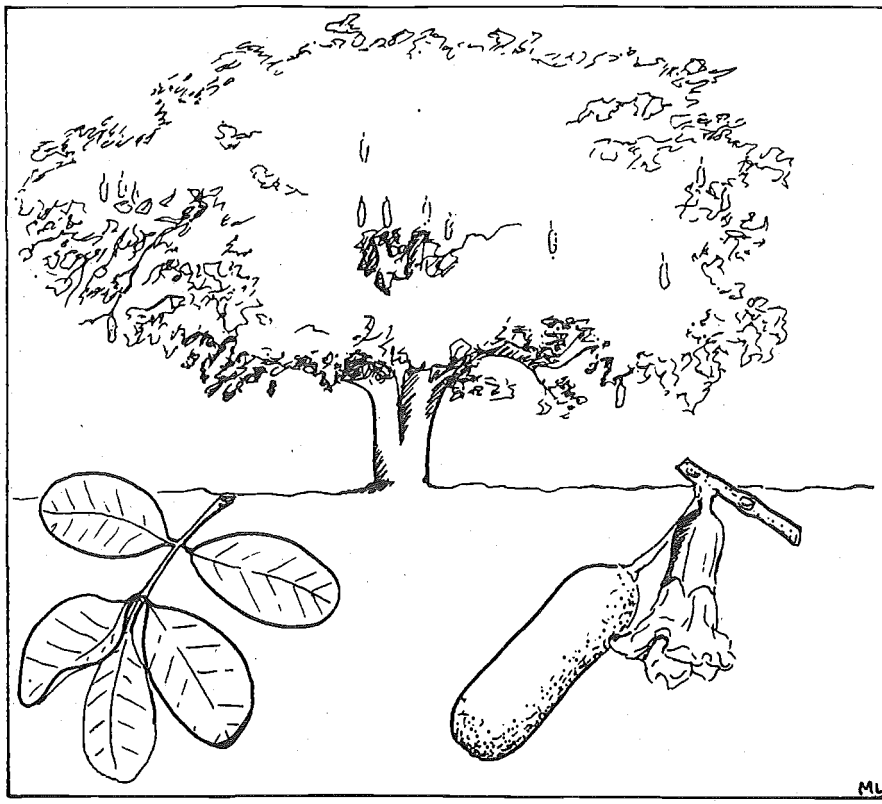


KIGELIA AFRICANA (K. AETHIOPICA)

LANNEA SCHWEINFURTHII* var. *STUHLMANNII

Family Name: ANACARDIACEAE
Common Names: mtundu, msiyu, false marula

Local Names: eravande (ARUSHA); mumbu (BONDEI, SHAMBAA, ZIGUA); muwumbu (GOGO); orbochandi (GOROWA, IRAQW); thigii, orbochandi, tambaragi (IRAQW); mumendo, omosaruwa (KURIA); mtokatoke (LONGO); muhingilo (LUGURU); ndelamwana (MATENGO); mpupi (MWERA); msaru (NGURIMU); mnyumbu (NYAMWEZI); musagha (NYATURU); msighe (PARE); msakawa (RANGI); mpiwipwi (RUFIJI); msayu, msirgu, nsayu (SUKUMA); muhondobogo, mnyamendi, mnbwampara (ZINZA).
Potential Uses: dye (bark = brown, red, purple), fibre (rope), fodder, fruit, furniture, medicine, ritual, tannin (bark), timber.

LONCHOCARPUS CAPASSA

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: rain tree, lilac tree

Local Names: mfumbii (BONDEI, SHAMBAA, ZIGUA); mpapala (GOGO); mfumbiri, mkunguga (LUGURU); mkaku (MATENGO, YAO); muvale, muvalevale, nkubangubi (NYAMWEZI); mware (SANGU, HEHE); libale (SANGU); nkuba-nghubi, mkubahuhi, mare, mivare, mnali, nmali (SUKUMA).
Potential Uses: bee plant, building materials, charcoal, domestic uses (tool handles, mortars), firewood, fodder, food (seeds), land improvement (nitrogen fixing), medicine, poison (fish), ritual.

MARKHAMIA OBTUSIFOLIA

Family Name: BIGNONIACEAE
Common Names: golden bean tree

Local Names: mpapa (BENDE); muyuyu, myuyu (BONDEI, SHAMBAA, ZIGUA); mguwoguwo (GOGO); khikhiwi (GOROWA, IRAQW); mkola (HA); mguagua, mguvani (HEHE); mumwilili (WEMBA); mkora (LONGO, ZIGUA); mbapa (LUGURU, NYAMWEZI); mpugapuga (MATENGO, YAO); ngeba (MWERA); khikhiwi, mlyali, mulati (NYATURU); itunene (RANGI); mguani (SANGU, HEHE); mbapa, mumbapa, mtarawanda (SUKUMA).
Potential Uses: building materials (houses), domestic uses (tool handles, toilet tissue), fencing (live), firewood, fodder, furniture, medicine, ritual (leaves used for fortunes), shade.

MARKHAMIA ZANZIBARICA (M. ACUMINATA)

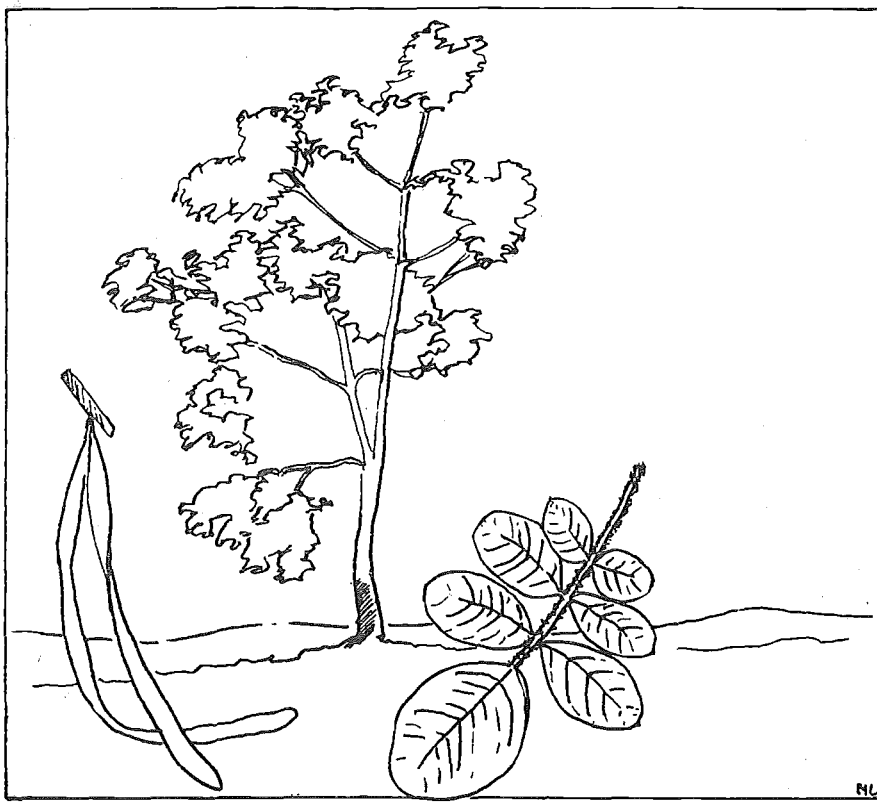
Family Name: BIGNONIACEAE
Common Names: mtalawanda, bean tree

Local Names: mtalawanda (GOGO, ZINZA); mtalavanda, mtalabanda (NYAMWEZI); mtarwenda, mtarewanda (RUFIJI); minziigutile, minza-wigutile (SUKUMA).
Potential Uses: building materials, domestic uses (tool handles, spoons), fibre (rope), firewood, furniture (beds), medicine.

MILICIA EXCELSA (CHLOROPHORA EXCELSA)

Family Name: MORACEAE
Common Names: mvuli, mvule, iroko (West Africa)

Local Names: muyanzi (BUNGU); mrie (CHAGGA); muzuli, mwuli (HAYA); mpugusi (HEHE, WANJI); mtalula (MWERA); mwale (NYAKYUSA); mvule (VIDUNDA); mzule (ZIGUA); msule (ZINZA).
Potential Uses: building materials, dye (bark = yellow), furniture, land improvement (mulch, nitrogen fixing), medicine, shade, timber (boats).



MARKHAMIA ZANZIBARICA (M. ACUMINATA)

OCOTEA USAMBARENSIS

Family Name: LAURACEAE
Common Names: mkulo, East African camphor wood, camphor

Local Names: nkuro, mkuro, mkulo, mtoa-mada, mkenene, mkarambaki, mtambaa (BONDEI, SHAMBAA, ZIGUA); muwong, mwawong, mseri (CHAGGA); muheti (HEHE); gwasi (IRAQW); mbawira (KINGA); musiwisiwi (KUKWE); msibisibi (NYAKYUSA); maase, maasi (PARE); nsebi (SAFWA); mkenene (SHAMBAA).
Potential Uses: beehives, building materials, crafts, firewood, furniture, land improvement, medicine, timber.

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OLEA CAPENSIS (O. WELWITSCHII)

Family Name: OLEACEAE
Common Names: mushargi, loliondo, iron wood, elgon olive

Local Names: olmasi (ARUSHA, MASAI, MERU); lolyondo (ARUSHA, PARE); nasojan (BARBAIG); mchiyo, mshio, mudi (CHAGGA); sasi (FIPA); sahati, flamno-awak, tsalmo (IRAQW); ololiondoi (MASAI); loliondo (MATENGO, YAO); mshiyo (MERU).
Potential Uses: building materials, charcoal, domestic uses (needles), fibre, firewood, fodder, furniture, land improvement (nitrogen fixing), medicine, timber (hard).

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OLEA EUROPAEA SUBS. AFRICANA (O. CHRYSOPHYLLA)

Family Name: OLEACEAE
Common Names: loliondo, brown olive, wild olive

Local Names: olorieni (ARUSHA, MASAI); emit (BARBAIG); mamala, muhagati, mziragembe, msakiro, mziaghembe (BONDEI, SHAMBAA, ZIGUA); senefu, mtamioi, mlamuru (CHAGGA); sahhati (FIOME); zahhati (GOROWA, IRAQW); mhagati, muhagati (HEHE); sahati, hlanmo (IRAQW); mamala (NGURU); ol oliondoi, oloi orieni (MASAI); lorieni (MERU); lagaiyanecheit (MANG'ATI); muranganji (PARE); msigajembe (SHAMBAA).
Potential Uses: bee plant, building materials, charcoal, crafts, domestic uses (water containers, walking sticks), fencing (live, posts), fibre (toothbrushes), firewood, fodder, food, fruit, furniture, land improvement (soil conservation, windbreaks), medicine, timber (hard).

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OXYTENANTHERA ABYSSINICA

Family Name: POACEAE
Common Names: mwanzi, mlanzi, plains bamboo, wild bamboo

Local Names: asi, lasi (BONDEI, SHAMBAA, ZIGUA); mulanzi, kitindi (HEHE); mbunga (KONDE); mlanzi (LUGURU); mlanzi, mlahi (MATENGO, YAO); mpunga, mwanzi (MWERA).
Potential Uses: beverage, building materials, domestic uses (arrows, tool handles), fencing (live, posts), fibre (baskets), fodder (leaves), food, furniture, land improvement (erosion control, windbreaks).

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PARINARI CURATELLIFOLIA

Family Name: CHRYSOBALANACEAE
Common Names: mbura, mbola plum, fever tree

Local Names: umbula, mbula nyakyusambula (BENDE); amafa-aa, amaafa (GOROWA, IRAQW); munanzi (HAYA, LONGO, ZINZA); msawola, msawula (HEHE); mnazi, umanazi, omunazi (LONGO); mbula, mbuni, mpembu, mbuui (MATENGO, YAO); mubula, muvula, (NYAMWEZI); mbula (NYAMWEZI, ZARAMO); ikusu, ibula (NYIHA); mafaa, mumura, mumora (RANGI); mnazi (SUKUMA); mnadsi (ZINZA).
Potential Uses: charcoal, domestic uses (yokes), dye (fruit = black; leaves = red; bark = red, brown), firewood, fodder, food (oil), fruit, medicine, tannin, timber (boats; hard).

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PARINARI EXCELSA

Family Name: CHRYSOBALANACEAE
Common Names: mbura

Local Names: mhula, mbula, muuwa, muula (BONDEI, SHAMBAA, ZIGUA); msabula, msaula (HEHE); muganda (PARE); mula, hula, muwa (ZIGUA).
Potential Uses: bee plant, beverage, crafts, charcoal, domestic uses, dye (fruit = black, red), firewood, fodder, food (oil), fruit, furniture, medicine, tannin (bark, wood), timber (hard).

PERICOPSIS ANGOLENSIS (AFRORMOSIA ANGOLENSIS)

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: muvange, mbanga, afromosia

Local Names: umubanga (HAYA); mmanga (LUGURU); muwanga (MATENGO, YAO); muvanga, mwanga (NYAMWEZI); mmanga (VIDUNDA); mbanga (ZINZA).
Potential Uses: charcoal, crafts, domestic uses (pestles, mortars), fencing (posts), firewood, furniture, gum, land improvement (nitrogen fixing), medicine, ritual (used to chase away witchcraft), timber (railway sleepers; hard).

PODOCARPUS LATIFOLIUS (P. MILANJIANUS)

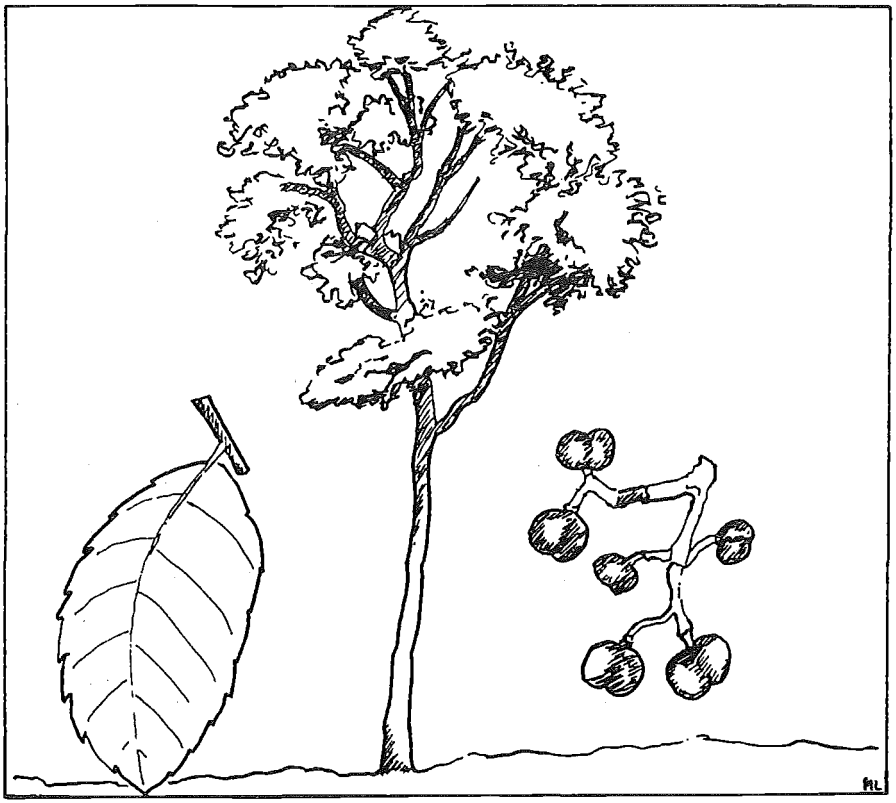
Family Name: PODOCARPACEAE
Common Names: podo, pod, east african yellow wood

Local Names: dukumo, dukmo (BARBAIG, IRAQW); laganechet, laganehel (BARBAIG); mse (BONDEI, SHAMBAA, ZIGUA); mtokosi, mtongosa, tawaso, msoso, mtosi (CHAGGA); mfulanyelele (FIPA); mwenbinyigo, mwembenyigo (HEHE); nuki (IRAQW); mkensi (KINGA); muanziri (LUGURU); orpiripiri (MASAI); mseso (MERU); nyalulasi (NYAKYUSA); lipume, muwima (PANGWA); mwarinyani (RANGI); siegi (SAFWA); mnoge (SANGU); msena-mawe, mse-mawa, msekichanga (SHAMBAA).
Potential Uses: building materials, crafts, firewood, furniture (boxes), medicine, shade, timber.

PRUNUS AFRICANA (PYGEUM AFRICANUM)

Family Name: ROSACEAE
Common Names: mkomahoya, mueni, bitter almond, red stinkwood

Local Names: olkonjuku, ol gujuk (ARUSHA); mdundulu, mkomahoya (BONDEI, SHAMBAA, ZIGUA); mudy, muuri, mkonde-konde, mseneo (CHAGGA); gwaami (FIOME); mfila (FIPA); guvaami, gwame, gwa'ami (GOROWA, IRAQW); gulaami (GOROWA); mwiluti, mwiuti (HEHE); mpembati (KINGA); olkonjuku (MASAI); mdundulu (NGURU); wami (RANGI); ligabo (SAFWA); mufubia (ZINZA).
Potential Uses: bee plant, building materials, charcoal, domestic uses (containers, mortars), firewood, furniture, land improvement (windbreaks), shade, timber.



PRUNUS AFRICANA (PYGEUM AFRICANUM)

PTEROCARPUS ANGOLENSIS

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: mninga, bloodwood

Local Names: mhagata, mninga (BONDEI, SHAMBAA, ZIGUA); asaninga (FIPA); mpagata (GOGO); muvembadanda (HEHE); mhagata (LUGURU); mtumbati (MATENGO, YAO, GOGO, MWERA, MATUMBI); mtumbati jangwa (MWERA); mninga (NYAMWEZI); mninga (SUBI); mlambadanda (VIDUNDA); muhagata, (SUKUMA, ZIGUA).
Potential Uses: bee plant, building materials, domestic uses (bowls, mortars), dye (wood, roots = red; bark = brown), firewood, fodder, furniture, gum, land improvement (nitrogen fixing, soil conservation), medicine, musical instruments (drums), timber (boats; resistant to termites, borers).

RAUVOLFIA CAFFRA (R. NATALENSIS)

Family Name: APOCYNACEAE
Common Names: mkufi, mwembe mwitu, msesawe, quinine tree

Local Names: njavokalia, ol chapukalyan (ARUSHA, MASAI); mlengwelengwe (BONDEI, SHAMBAA, ZIGUA); mtwentwe (BENDE); msesewe (CHAGGA, MERU); mkongo (GOGO); harey, hariie (GOROWA, IRAQW); muverivevi (HEHE); msumai (RANGI); oljabokalyan (MASAI); mtelawa, mbamba (MATENGO, YAO); musunguti (NYIHA); mutu (MERU); nkuma, mkuna, mpugupugu (NYAKYUSA); muyesani, mwimbe, msabua, mvumbamvula (NYANJA); ng'weeti, mweti (SHAMBAA); tuungulemba (TAN).
Potential Uses: beehives, bee plant, beverage (beer), building materials, domestic uses (containers, pipes, spoons, tool handles), firewood, furniture, land improvement (soil and water conservation, nitrogen fixing), medicine, shade.

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RHUS NATALENSIS

Family Name: ANACARDIACEAE
Common Names: red currant

Local Names: emusigiyai (ARUSHA); ormisigiyoi (ARUSHA, MASAI); mhunguru-mhomba (BONDEI, SHAMBAA, ZIGUA); msangula (FIPA); msakasaka, mkungulu (GOGO); datlii (GOROWA); msagara (HA); msagara, omusheshe (HAYA); mtunumbi, muhehefu (HEHE); mstunga, sirongi ambalung, daltii, datei (IRAQW); mubulagankuku (ISANZU); musheshe (KEREWE); msangura (KURIA); msenswa (LONGO); ol mesigei (MASAI); musyunga (NYATURU); msakasaka (RANGI); mhunguru (SUKUMA); msense (ZINZA).
Potential Uses: beverage (beer), fibre (toothbrushes), firewood, fruit, medicine, timber.

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SALVADORA PERSICA

Family Name: SALVADORACEAE
Common Names: musuake, msuake, mustard tree, toothbrush tree

Local Names: mswaki, simbakigulu (BONDEI, SHAMBAA, ZIGUA); mkunghuni (GOGO); msaki, mswaki (GOROWA, IRAQW); eremiti, o remit (MASAI); modee (MBUGWE); chigombo (MWERA); mswake (SANGU, HEHE); muche, mswake (SUKUMA); mswaki (ZIGUA).
Potential Uses: fibre (toothbrushes), firewood, fodder, food (oil), fruit, land improvement (erosion, salt control, soil reclamation), medicine, soap.

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SOLANUM INCANUM

Family Name: SOLANACEAE
Common Names: mndulele, mtunguja

Local Names: endulele (ARUSHA); hangalmo (BARBAIG, GOROWA, IRAQW); mtua, mtula (BONDEI, SHAMBAA, ZIGUA); nduo (CHAGGA); hangal (GOROWA, IRAQW); mtula endulelei (MASAI); matungusa, mtungujamito, mtungusa (NYAMWEZI); ntula (SUKUMA).
Potential Uses: fruit, medicine, ritual.

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STROPHANTHUS EMINII

Family Name: APOCYNACEAE
Common Names: msungulu, mtondo

Local Names: mvyo-vyo, mvele vele, mwese wese, mweri weri, mveli veli, mwelewele, mvingayakale (GOGO); mtowo, muveriveri, mtolo, (HEHE); msegwe (LONGO); msungururu (NGURU); mwiliweli, mwelewele, mtungululu, muveriveri, muvelevele, mwiveli (NYAMWEZI); mtowo (RUAHA); nyawera (SANGU, HEHE); msungulula, msungululu (SUKUMA); msengwe (ZINZA).
Potential Uses: building materials, crafts (beads), domestic uses (tool handles), medicine, poison.

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STRYCHNOS COCCULOIDES (S. SCHUMANNIANA)

Family Name: LOGANIACEAE
Common Names: mpera-mwitu, mtonga, corky-bark monkey orange

Local Names: mpande (GOGO); mkome (LONGO); mdonga, madonga (MATENGO, YAO); m'milwa, mtonga, mumilwa, (NYAMWEZI); mnyowa, mnywewa (SANGU, HEHE).
Potential Uses: building materials, domestic uses (tool handles), dye, fodder, fruit, medicine, shade, soap.

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STRYCHNOS INNOCUA

Family Name: LOGANIACEAE
Common Names: mtonga, mgulungungulu

Local Names: bunkundu (BENDE); mkwaka, mtonga (BONDEI, ZIGUA); mkulua, munhulwa (GOGO); furundau, hohoigara (GOROWA, IRAQW); muhundwa (HA); mbaya (HEHE); mukomo, mkomu msege (KURIA); mkome (LONGO); hehemgulungulu (MWERA); mtonga, mumundu, mkulwa, mpundu (NYAMWEZI); mpundu, mkulugundu (NYATURU); mung'ulung'ulu (SANGU); g e'kegheke (SANDAWI); mtanga (SHAMBAA); mhundu (SUKUMA); mumirwa (SUMBWA); msungwe (ZANAKI); mkome, mkwata (ZINZA).
Potential Uses: building materials, domestic uses (tool handles), firewood, fruit, medicine.

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SYZYGIUM CORDATUM

Family Name: MYRTACEAE
Common Names: waterberry

Local Names: msu (FIPA); mzambarao, muhu, muhulo (GOGO, LUGURU); awartu (GOROWA, IRAQW); mugege (HAYA); mnyono, muvengi (HEHE); orokutuno, irakutwa (IRAQW); msivia (HA); imivengi (KINGA); mgege, mgeye (LONGO); msungunde (NGURU); mpegele (NYAKYUSA); mshiwi (SHAMBAA); mtalala mweupe, mzati (ZARAMO); mzeze (ZINZA).
Potential Uses: beverage, building materials, dye (bark = black, blue), firewood, fruit, furniture, medicine, poison, ritual.

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SYZYGIUM GUINEENSE

Family Name: MYRTACEAE
Common Names: mzambarau mwitu, msambaran, mzambarai, woodland waterberry, waterpear, waterboom

Local Names: geta-da-qwal (BARBAIG); mulambo (BENDE); masdi (CHAGGA); mulambo, mlalambo (FIPA); mzarabo (FUFIJI); muhulo (GOGO); awartu (GOROWA); mchwezi (HAYA); muvengi, muvenge (HEHE); muswaru, mkamati, mbajiru, matlarmo, sonari, irgatu (IRAQW); issassa (KEREWE); nguluka, mpegele (KONDE); msalazi (LONGO, LUGURU); nkolo (MATENGO, YAO); msengele, muhu (NYAKYUSA); mwasya, kisambalawe (NYAMWEZI); mzarabo (RUFIJI); muhuba, mschihui, sambarau (SHAMBAA); msambarao (TAN COAST); muvenge (ZIGUA); msanguru, mgege (ZINZA).
Potential Uses: bee plant, building materials, charcoal, domestic uses (seasoning containers), firewood, fodder, fruit, medicine, tannin, timber (hard).

TAMARINDUS INDICA

Family Name: LEGUMINOSAE (SUBFAMILY CAESALPINIOIDEAE)
Common Names: mkwaju, tamarind

Local Names: ol masambrai (ARUSHA, MASAI); mshishi (BENDE, NYAMWEZI, SUKUMA); mkwazu, nshishi (BONDEI, SHAMBAA); moya (CHAGGA); msisa (GOGO, LONGO, ZINZA); mishighi (GOROWA, IRAQW); mitlighi, mithingiti (GOROWA); ukwezu, mkwezu (MATENGO, YAO); mosinko (MBUGWE); mkwaju (NYATURU, TAN); mkwesu (RUFIJI, ZIGUA); mkwaja, mkweso (RUFIJI); msisi, (SANGU, HEHE, GOGO, BENDE, NYAMWEZI); mkwaju, nshishi, bushishi (SUKUMA); mdai (VIDUNDA); musisa (ZINZA).
Potential Uses: bee plant, beverage, charcoal, domestic uses (tool handles, mortars, pestles, walking sticks, carts), fencing (posts), fibre (chew sticks), firewood, fruit, furniture, gum, land improvement (nitrogen fixing), medicine, shade, tannin, timber (boats).

TECLEA NOBILIS

Family Name: RUTACEAE
Common Names: small-fruited teclea

Local Names: litisi, li-itsi (BARBAIG); mlimangombe (CHAGGA); omuzo (HAYA); mputsa, mwatatsi (HEHE); iiliisi, wahari (IRAQW); muzo (LONGO); mdimu (NYAMWEZI); nkwaati, kilongolo (SHAMBAA); mju (SUKUMA); mudso, mudzo (ZINZA).
Potential Uses: building materials, charcoal, domestic uses (hoe pins, bowls, clubs, tool handles, spears, walking sticks), firewood, land improvement (soil and water conservation), medicine.

TERMINALIA SERICEA

Family Name: COMBRETACEAE
Common Names: mkaa, silver terminalia

Local Names: kaselenge (BENDE); mbuko (CHAGGA); bukuumo (GOROWA, IRAQW); sarakwi (GOROWA); mwanya msimira (LONGO, ZINZA); moumba (LUGURU); olbukoi (MASAI); mufuulu (NYATURU); mpululu (SANGU, HEHE, GOGO); mzima, (SUKUMA, NYAMWEZI); mtanga (ZARAMO); msinira, munyaga (ZINZA).
Potential Uses: building materials, charcoal, domestic uses (tool handles), fencing (posts), fibre (rope), firewood, fodder, furniture, land improvement, medicine, shade, timber.

TREMA ORIENTALIS (T. GUINEENSIS)

Family Name: ULMACEAE
Common Names: msasa, mpesi, mgendagenda, pigeonwood

Local Names: ol matata (ARUSHA); mshinda, mshinga (BONDEI, SHAMBAA, ZIGUA); lushinga (BUNGU); mwezi, mshinga, mwesi (CHAGGA); maauk (GOROWA); omuhuwe, muuwe (HAYA); slarakahe (IRAQW); omuhohwe (KEREWE); mpeswe (KUKWE); mbefu (LUGURU); mpeho (MATENGO, YAO); mwefu (MERU); mpehwe (NYAKYUSA); mwesu (PARE); mohowe (SUKUMA); mpehe, mshanulo, mbehe, mpessi, mpehi (ZARAMO); mpera, mshinga, boriti, msinga (ZIGUA).
Potential Uses: bee plant, building materials, charcoal, dye (leaves = brown), fencing (posts), fibre (rope, fishing line), firewood, fodder, fruit, land improvement (mulch, soil reclamation, nitrogen fixing), medicine (insect repellant), shade.

TRICHILIA EMETICA (T. ROKA)

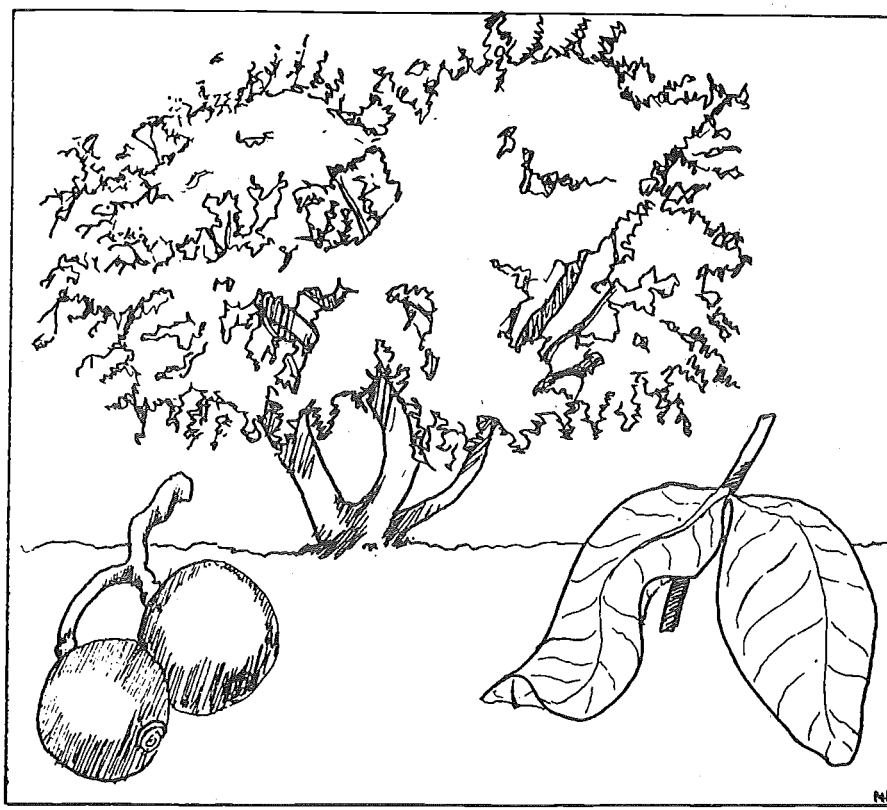
Family Name: MELIACEAE
Common Names: mkungwina, mtimaji, mtimai, musikili, natal mahogany

Local Names: mgolimazi, mbangwe, mbwewe, (BONDEI, SHAMBAA, ZIGUA); mkongoni, mehengo, mchengo, mututu, mwavai (CHAGGA); nyembe mwitu (GOGO); taewi (IRAQW); mtengotengo, mjagengo (LUGURU); ketakaiko (MBUGWE); mgolemazi (NGURU, SHAMBAA); msanguti (NYAKYUSA); mtandaruka (SUBI); sungute (SUKUMA); monko-ya-nyika (ZIGUA, SHAMBAA).
Potential Uses: bee plant, building materials, firewood, fodder, furniture, land improvement (catchment rehabilitation, windbreaks), medicine, poison, ritual, shade, soap (seeds = oil), timber.

UAPACA KIRKIANA (U. GOETZEI)

Family Name: EUPHORBIACEAE
Common Names: mkusu, wild loquat

Local Names: mhugu (BONDEI, SHAMBAA, ZIGUA); mguhu (HEHE, BENA); mkusu (HEHE, NYAMWEZI, BENA, BENDE, LONGO); mgulu, ntalla (HEHE); mhendabogo, mugusu (LONGO); msuku, mhuku (MATENGO, YAO); mssuku (NGONI); mkuhu (NYAKYUSA); migulu (LUGURU).
Potential Uses: bee plant, beverage (beer), building materials, charcoal, domestic uses (spoons), firewood, fruit, furniture, medicine, shade, timber (termite, borer resistant).



VANGUERIA INFAUSTA (V. TOMENTOSA)

VANGUERIA INFAUSTA (V. TOMENTOSA)

Family Name: RUBIACEAE
Common Names: mtiegu, viru, mviru, muiru, wild medlar

Local Names: engumi (ARUSHA, MASAI); mvilu, mviu (BONDEI, SHAMBAA, ZIGUA); babaxchet, matharimo, malharimog, barangu (BARBAIG); msanda (FIPA); baranku (GOROWA); msada (HEHE, NYAMWEZI, VIDUNDA); msambarawe (HEHE); mviru, muvirwa, barai (IRAQW); mukungulusuli (ISANZU); mufitanda (KEREWE); mgango (LONGO); mpendo, lindikiti (MATENGO, YAO); mulade-mujenghuma (NYATURU); mdaria, ndaria (PARE); mnyabwite (ZINZA).
Potential Uses: building materials, firewood, fruit, land improvement (nitrogen fixing), medicine (some people do not use this tree as it is believed to possess evil powers).

VANGUERIA MADAGASCARIENSIS

Family Name: RUBIACEAE
Common Names: mviru

Local Names: engumi, ol madanyi (ARUSHA, MASAI); loshoro (ARUSHA); karowo, kiworo, ndawiro, ndowo (CHAGGA); msada (GOGO, NYAMWEZI); muviru, msada (GOGO); mviru erakwtu (IRAQW); imumua (MERU); mulade (NYATURU); mubilu (NYIRAMBA); mbiro, mdaria (PARE).
Potential Uses: building materials, firewood, fruit.

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VITEX DONIANA (V. CUNEATA, V. CIENKOWSKII)

Family Name: VERBENACEAE
Common Names: mfuu, mfulu, mfudu, vitex, black plum

Local Names: mgobe (BONDEI, SHAMBAA, ZIGUA); mufita (FIPA); mfulu (GOGO, ISANZU, LUGURU); orrolmo (GOROWA); mjumbau, mpuru, mukoronto (KEREWE); muviru, muvuru (LONGO); kiputu (LUNGU); mpitimbi (MATENGO, YAO); mpindimbi (MWERA); mgwobe (NGURU); mfulu, mfuzu, mfurulegea, mpulu (NYAMWEZI); mkunungu (NYIHA); mchinka, mufita (SUMBWA); mkoga (VIDUNDA); mfuru (ZARAMO, LUGURU, MBUNGA, POGORO); muvuru (ZINZA).
Potential Uses: bee plant, building materials, charcoal, crafts, dye, firewood, fodder, food, fruit, furniture, land improvement (mulch, nitrogen fixing), medicine, shade, tannin, timber (boats).

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VITEX PAYOS (V. IRINGENSIS)

Family Name: VERBENACEAE
Common Names: mfulu

Local Names: mfulu (GOGO, HEHE).
Potential Uses: bee plant, building materials (roofing), firewood, fodder, fruit, medicine.

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WARBURGIA SALUTARIS (W. UGANDENSIS)

Family Name: CANELLACEAE
Common Names: msokonoi, ol sokoni, east african greenheart, pepper-bark tree

Local Names: mdee, mdele, mlifu (BONDEI, SHAMBAA, ZIGUA); sokanay, sagonai (GOROWA, IRAQW); muhiya (HAYA); msokonoi, olmsogoni (MASAI); musuni (MERU).
Potential Uses: firewood, fodder, food (leaves = spice; roots = soup), gum (glue), land improvement (green manure, mulch, nitrogen fixing), medicine, resin, shade, timber.

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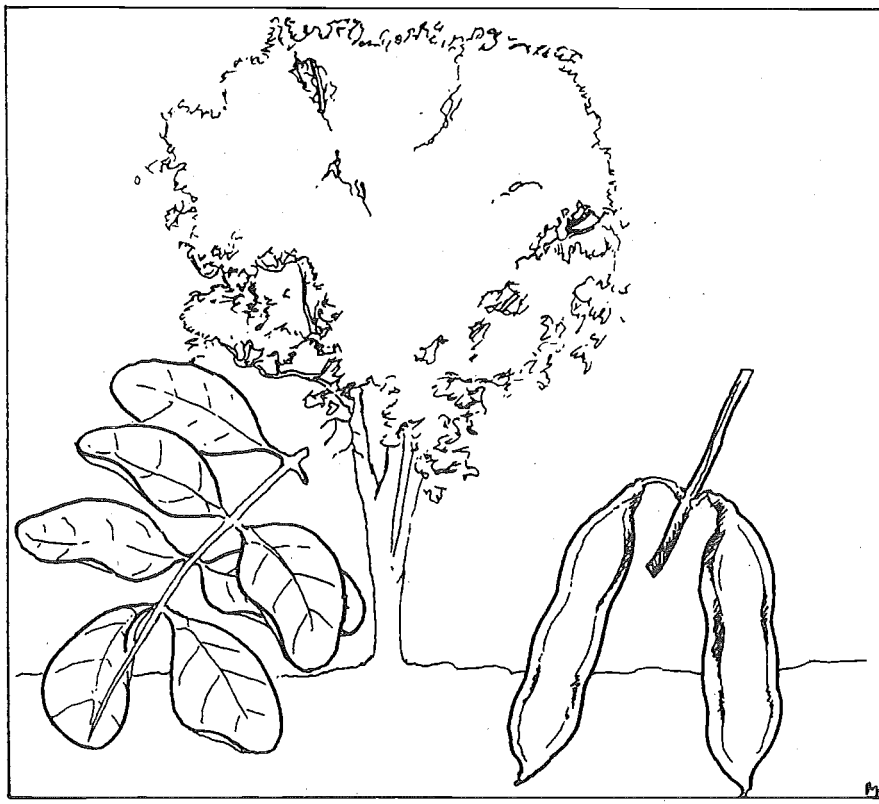

XERODERRIS STUHLMANNII

XERODERRIS STUHLMANNII

Family Name: LEGUMINOSAE (SUBFAMILY PAPILIONOIDEAE)
Common Names: wing pod

Local Names: mnyinga (GOGO), mnyenye (NYAMWEZI).
Potential Uses: beehives, domestic uses (mortars), dye (bark = red), firewood, fodder, furniture (local chairs), land improvement (windbreaks), medicine, ritual, shade.

XIMENIA AMERICANA

Family Name: OLACACEAE
Common Names: timbui timbui, mtumbui tumbui, mtundakula, mpingi, small sourplum, wild plum

Local Names: mpingipingi (BENA); msantu (BENDE); muhingi, mtundwi (BONDEI, SHAMBAA, ZIGUA); lama (CHAGGA); mpundwe, mtundwe (GOGO); tarantu (GOROWA, IRAQW); mingi, mtundwahai (HEHE, SANGU); mutuhu (IRAQW,ISANZU); olama (MASAI); membwa (MATUMBI); ol amai (MBUGWE); mnembwa (NYAMWEZI, SUMBWA); mnemwua, mbangwa nyoma, mtundwa, mnembwa mudo (NYAMWEZI); mpingi (RUFIJI); msheka (RULI); mpingi, mtundwa (SUKUMA); mhingi (ZARAMO).
Potential Uses: beverage, domestic uses (tool handles), firewood, fodder, food (oil), fruit, medicine.

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XIMENIA CAFFRA

Family Name: OLACACEAE
Common Names: tundwa, large sourplum
Local Names: maayangu (BARBAIG, GOROWA); musamtu (BENDE); mtundwe (GOGO); maayangumo (GOROWA); mjengu, mjingu, mtundui (ISANZU); mseaka (KEREWE); mseka, museka (LONGO, ZINZA); lama (MASAI); mtundwa (NYAMWEZI, HEHE, SUKUMA); mnembwa, mtundwa (NYAMWEZI); mutundwe (NYATURU); msheka (RULI); mingi (SANGU, HEHE); mnembwa (SUMBWA).
Potential Uses: building materials, domestic uses (oil, spoons, tool handles), firewood, food, fruit, medicine.

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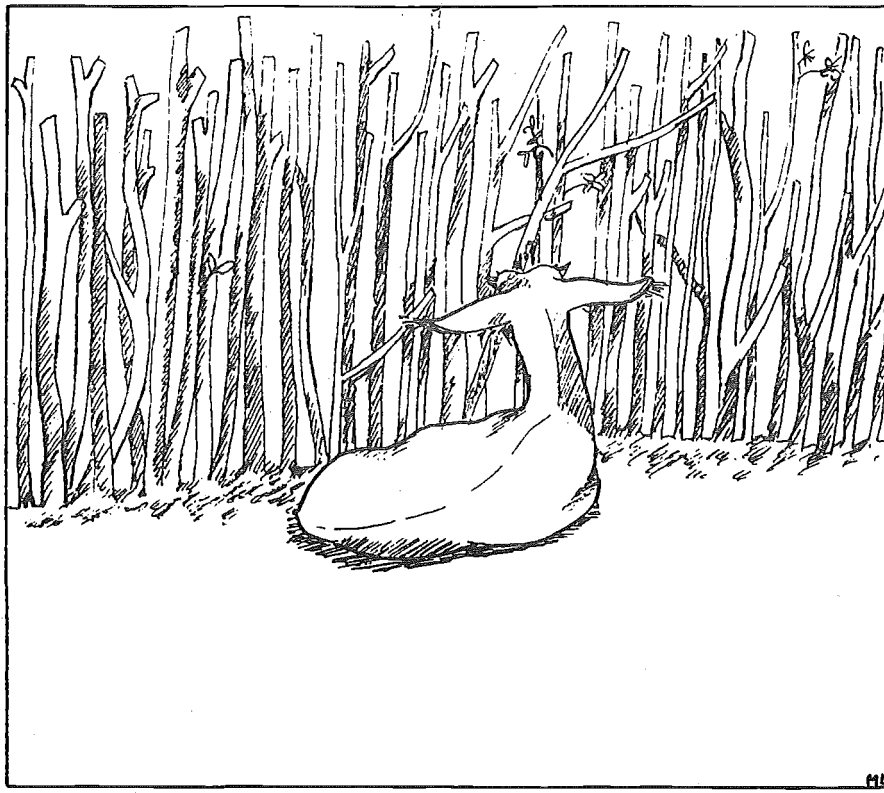


5. Species Profiles

5.1 Introduction

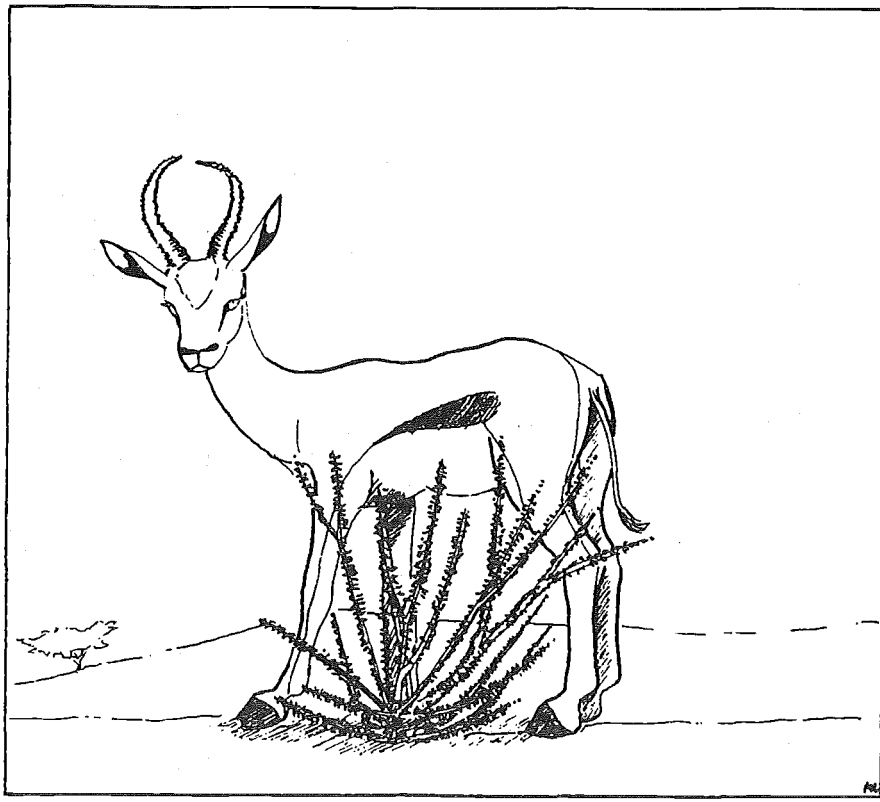
This section contains information about the propagation, care, and management of selected indigenous trees that were identified during the formal survey as having highly valued forest tree products and potential for planting in Tanzania. (Refer to Table 5.1.) It includes, to the extent possible, information on local management and propagation techniques. This information is integrated into a species profile which also includes uses (presented in Section 5.4).

A brief summary of propagation techniques is found in Section 5.2. Since space limits the amount of information that can be included, reference texts such as those by Weber and Stoney (1986), Rocheleau, Weber, and Field-Juma (1988), or Young (1989) are recommended for detailed information on propagation and silvicultural techniques. For information on silviculture, the reader is referred to a good silvicultural textbook such as Smith (1986).

TABLE 5.1
Species Highly Valued by Local People, Having Multiple Uses and Suitable for Planting

Acacia albida (F. Albida) *	*Commiphora ugogoensis*	*Olea capensis* *
Acacia lahai	*Cordia africana* *	*Olea europaea* *
Acacia mellifera *	*Cordia sinensis* *	*Oxytenanthera abyssinica* *
Acacia nilotica *	*Croton macrostachyus*	*Parinari curatellifolia* *
Acacia polyacantha	*Croton megalocarpus* *	*Podocarpus latifolius*
Acacia tortilis *	*Dalbergia arbutifolia*	*Pterocarpus angolensis* *
Adansonia digitata *	*Dalbergia melanoxylon* *	*Rauvolfia caffra* *
Afzelia quanzensis *	*Dichrostachys cinerea* *	*Salvadora persica* *
Albizia gummifera *	*Diospyros mespiliformis* *	*Strophanthus eminii*
Albizia petersiana	*Entada abyssinica* *	*Strychnos cocculoides* *
Albizia schimperana *	*Erythrina abyssinica* *	*Syzygium guineense* *
Albizia versicolor *	*Euphorbia tirucalli* *	*Tamarindus indica* *
Annona senegalensis *	*Faurea saligna*	*Teclea nobilis* *
Azanza garckeana *	*Ficus sycomorus* *	*Terminalia sericea* *
Balanites aegyptiaca *	*Ficus thonningii* *	*Trema orientalis* *
Berchemia discolor *	*Flacourtia indica* *	*Trichilia emetica* *
Brachystegia spiciformis *	*Grewia bicolor* *	*Uapaca kirkiana* *
Breonadia salicina *	*Grewia platyclada*	*Vangueria infausta*
Bridelia micrantha *	*Juniperus procera* *	*Vangueria madagascariensis* *
Burkea africana *	*Khaya anthotheca* *	*Vitex doniana* *
Cassipourea malosana *	*Lonchocarpus capassa* *	*Vitex payos*
Combretum adenogonium *	*Markhamia obtusifolia* *	*Warburgia salutaris* *
Combretum molle *	*Markhamia zanzibarica*	*Xeroderris stuhlmannii*
Commiphora africana *	*Milicia excelsa* *	*Ximenia americana* *
Commiphora eminii *	*Ocotea usambarensis* *	*Ximenia caffra* *

* = Species profiles are presented in Section 5.4.



Silvicultural and management information about species indigenous to East Africa is sketchy and somewhat difficult to find. Little research has been done on their propagation and ecology, in contrast to many well-known exotic species. Some species that were identified by survey respondents as having valuable multiple uses such as *Berchemia discolor, Breonadia spp.*, and *Oxytenanthera abyssinica*, are poorly researched or undocumented. Other species like *Tamarindus indica* and *Acacia nilotica* are well researched, and a good deal of information already exists on their propagation and management. Consequently, the species profiles presented in this section are somewhat uneven, with some species having considerable detail and others having relatively little.

In some cases considerable information exists for one species, but not for another in the same genus, for example *Acacia nilotica* and *Acacia mellifera*. Readers may wish to experiment by trying techniques described for a related species, but with the caveat that what works for one may not work for another. In these cases trial and error is the only way to determine effective techniques.

5.2 Propagation and Management Techniques

Collecting and Storing Seeds

Seeds should be collected from healthy, vigorous trees that are middle-aged. In general, large seeds germinate better and produce larger seedlings than small seeds. However, all seeds should be clean, dry, and free from insects. They can be stored in baskets, gunny bags, or boxes if air is allowed to circulate freely around the container and should be checked periodically for insect infestation. Seeds vary in the length of time that they remain viable, or are able to germinate. Stored seed from some species may keep for several years. However, it is best to use fresh seed when planting.

Preparing Seeds for Planting

Many tree seeds must undergo a period of dormancy before they will germinate. There are 2 types of dormancy: physical and physiological. By pretreating seeds in various ways it is possible to overcome both forms of dormancy. Physical dormancy occurs in seeds with protective seed coats. It ends when the seed coat is somehow opened by a process of mechanical abrasion, nicking, soaking in hot water or acid, or by passing through the intestines of a bird or animal (scarification).

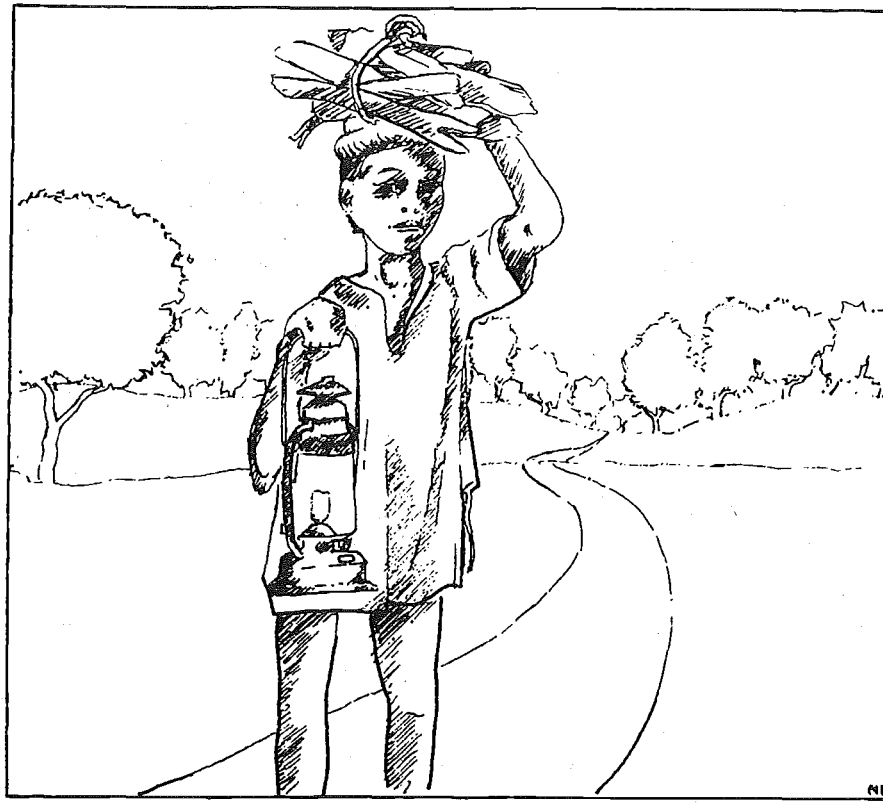
There are several methods of pretreating seed by scarification:

- use sand paper to scratch the hull (this can be time consuming);
- mix the seeds in a container with wet coarse sand and shake the container;
- use fingernail clippers to crack or nick the seed, being careful not to clip the seed germ;
- immerse the seeds in an acid bath for a few seconds — be careful to store acid solutions very securely (Weber and Stoney 1986).

Physiological dormancy takes place in seeds that have not yet digested the fats, proteins, and other substances stored in the seed. These substances must be broken down into sugars and amino acids that can be absorbed by the embryo before the seed will germinate. Seeds with physiological dormancy are still immature and unripe, but can be treated in a way that promotes respiration in the seed (stratification), such as exposing the seed to a change in light or temperature.

To pretreat seed by stratification:

- bring water to a boil in a suitable container;
- remove from heat and let stand for 5 minutes;
- add the seeds and let them soak overnight;
- plant the seeds the next day (Weber and Stoney 1986).



Little research has been done on the subject of physiological dormancy of trees indigenous to Tanzania. Table 5.2 lists expected dormancy for selected native species.

Propagation by Seed

Seedbeds or containers should be prepared by watering frequently in small amounts for about 2 weeks before planting. Weeds that sprout during this time should be removed. Spacing is determined by the expected germination rate. Spacing of seeds is closer if germination is expected to be low. Conversely, if seed is fresh and germination is expected to be high, plants should be spaced further apart. Where known, information on recommended spacing is provided in the species profiles.

Vegetative Propagation

Some trees do not produce viable seed and must be propagated vegetatively, such as certain kinds of bananas, figs, and oranges. Other species, such as *Euphorbia*, may be more successfully propagated by cuttings than by seed.

TABLE 5.2

Selected Tanzanian Species Posing Germination Problems and Their Expected Dormancy

Species	Physical Dormancy	Physiological Dormancy
Acacia albida	•	
Acacia tortilis	•	
Albizia schimperana		•
Borassus aethiopum	•	
Catha edulis		•
Clutia abyssinica		•
Cordia africana	•	
Kigelia africana	•	
Maesopsis eminii		•
Melia volkensii	•	•
Sclerocarya caffra	•	
Syzygium guineense		•
Trema guineense		•
Trichilia emetica		•
Vangueria infausta	•	•
Warburgia salutaris	•	•
Zizyphus mauritiana	•	

Adapted from Shehaghilo 1990.

Vegetative propagation consists of several methods including cuttings, root cuttings, and grafting. In East Africa the most common form of vegetative propagation is by cuttings. Cuttings should be taken from young, vigorous shoots or suckers from a healthy, mature tree. Depending on the species, the cuttings can be placed either in a pot filled with water, or directly into a trench which is kept moist. After a period of time the shoot will produce roots, and it can then be transplanted to a permanent site.

Cuttings from roots is another method of vegetative propagation, whereby roots are dug up, removed from the plant, and cut into pieces. Buds will form and produce a shoot and new root system. However, this method is uncommon. For further information about vegetative propagation, see a textbook such as Hartmann and Kester (1983).

Seedling Nurseries

In a nursery many small seedlings can be sheltered and intensively cared for in a small space as nurseries can provide access to water, protection from grazing animals, and shade. Nurseries should be located near a reliable water source and on level ground. Seedlings can be grown either in beds or in containers such as cans, plastic pots or bags, or in pots made from local materials such as banana leaves. Seedlings should be weeded every 10 days. Different species will require various amounts of

time in the nursery, depending on their rate of growth and other conditions. Before the seedlings are outplanted they should be hardened off by gradually reducing the amount of water and shade for a few weeks beforehand. Weak, diseased, undersized, or overgrown seedlings should be culled.

Tending of Trees and Stands

Seedlings should be outplanted at the beginning of the rainy season to ensure an adequate water supply, and watered immediately after they are planted. Thereafter, hand watering may be needed if rainfall is inadequate. Weeding is essential to give the seedlings adequate light and air circulation, and to prevent competition for nutrients from weeds. As the trees grow, thinning may be needed to reduce competition for light and nutrients, and to remove weak or diseased trees.

Pruning and pollarding are 2 other widespread management practices used by farmers in Tanzania. Pollarding is a harvesting technique by which selected branches and the top of the tree are cut, often for fuelwood. This technique allows control over the height of the tree, whereas pruning controls lateral growth. Pruning can also be used to control the release of nutrients and improve productivity, for example in fruit trees. It is preferable to undertake these operations during or at the end of the dry season in order to facilitate healing and encourage new shoots and branches to grow during the rainy season.

5.3 Local Vegetative Propagation and Tree Tending Techniques

Local management and propagation techniques range from retaining certain trees in the *shamba* and around the home compound, to propagating and actively managing and tending selected trees or groups of trees. (Table 5.3 lists identified indigenous species that have been propagated in Tanzania by farmers.)

Preliminary findings from a study undertaken by Kajembe (1992) indicate that the most complex spatial arrangements were found in home gardens and that simpler planting patterns were found away from the homestead and on farmland. Further, exotic tree species tend to be more prominent in zonal arrangements, whereas indigenous trees often grow naturally among crops or fallows. Findings from the formal survey show that indigenous trees tend to be planted around the home compound or, in areas where farmers are concerned about soil improvement or water retention, and where retained or protected trees have been cut.

A variety of propagation methods is used depending on the species and the techniques known by the farmer. Those identified during the survey include:

- direct sowing, for example, guava (*Psidium guajava*), mango (*Mangifera indica*), and *Pterocarpus angolensis*;
- vegetative propagation by cuttings, for example, *Acacia tortilis, Commiphora africana, Commiphora ugogoensis, Euphorbia tirucalli, Ficus sycomorus, Ficus thonningii, and Grewia platyclada*;
- vegetative propagation by suckers, for example, *Albizia schimperana, Juniperus procera, Ocotea usambarensis, Olea capensis, Podocarpus latifolius, Vangueria infausta*;
- transplanting wildlings, for example, *Acacia tortilis, Albizia schimperana, Commiphora africana, Commiphora ugogoensis, Ficus thonningii, Ocotea usambarensis*;
- coppicing in order to produce new shoots from stumps that have been cut, for example *Acacia spp.*.

Weeding, protection and watering were the most frequent management techniques identified by survey respondents. However, many farmers indicated that once planted, the tree received no after care until pruning or harvesting. Management practices seen in the field included putting ripe, fresh melons at the base of new seedlings (in this case pawpaw) to provide water and nutrients to young plants, placing thorny *Acacia* branches around young seedlings to protect them from cattle grazing, weeding around the plant, and in a few cases watering individual trees.

TABLE 5.3
Planted Indigenous Species

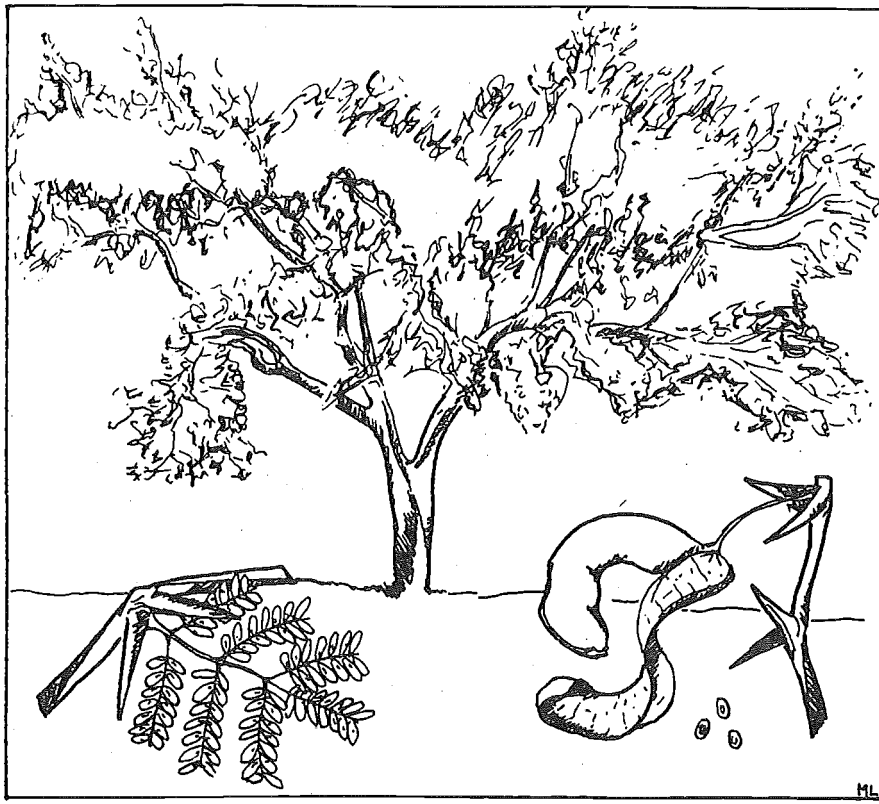
Acacia albida (F. albida)	*Croton megalocarpus*	*Podocarpus latifolius*
Acacia nilotica	*Dalbergia melanoxylon*	*Pterocarpus angolensis*
Acacia tortilis	*Euphorbia tirucalli*	*Rauvolfia caffra*
Adansonia digitata	*Ficus sycomorus*	*Strophanthus eminii*
Afzelia quanzensis	*Ficus thonningii*	*Syzygium guineense*
Albizia gummifera	*Flacourtia indica*	*Tamarindus indica*
Albizia schimperana	*Grewia bicolor*	*Teclea nobilis*
Annona senegalensis	*Grewia platyclada*	*Terminalia sericea*
Brachystegia spiciformis	*Juniperus procera*	*Trema orientalis*
Breonadia salicina	*Kigelia africana*	*Uapaca kirkiana*
Bridelia micrantha	*Lonchocarpus capassa*	*Vangueria infausta*
Commiphora africana	*Ocotea usambarensis*	*Vitex payos*
Commiphora ugogoensis	*Olea capensis*	*Ximenia caffra*
Cordia africana	*Olea europaea*	
Croton macrostachyus	*Oxytenanthera abyssinica*	

Pruning was also mentioned as a silvicultural technique by a few respondents, but they stated that they did not undertake it to specifically improve productivity.

5.4 Species Profiles

Species profiles are presented in Section 5.4. An asterix (*) is used to identify those species recommended for planting schemes by foresters in Tanzania.

ACACIA ALBIDA*



DISTRIBUTION

The tree is widespread in semiarid areas of Africa on a wide range of soil types and within varying climates and habitats. Mean annual temperatures range from 15 to 25 degrees C, but are usually over 20 degrees C. It prefers semiarid, alluvial, riverine zones and depressions with water present below the surface (Forest Division 1984). *A. albida* is found in Kilimanjaro, Arusha, Tanga, Mbeya, Iringa, Dodoma, Tabora, and Ruvuma. Prefers drier areas with a high water table (Teel 1984).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	250
Maximum Rainfall (mm) :	1800
Rain Months :	6-9
Minimum Temperature (C) :	6
Maximum Temperature (C) :	42

REQUIREMENTS

Soil Requirements : Favours coarse-textured, alluvial soils (loamy, sandy) and well-drained soils. Avoids heavy clays (FAO 1988). It tolerates a range of soils, seasonal waterlogging, and slight salinity.

Light Requirements : Strongly demanding.

Influential Factors : Develops a massive root system with a deep tap root, allowing good growth in areas with rainfall as low as 300 mm if roots have access to the water table. For optimal growth and biomass production it requires a high water table. Teel (1984) reports that in Kenya without a water table closer than 7 m to the surface it is not worth planting. It is slightly tender to frost (Palmer and Pitman 1972).

PROPAGATION

Means of Propagation : Direct sowing of pretreated seed, or nursery seedlings. Coppicing.

Seeds per kg :	15000
Germination Rate (%) :	90
Germination Length :	14-28 days treated
Seed Sources : 1500 TSH per kg - Tanzania National Seed Centre 1991/92.	

Seed Treatments : A large tree in a good year bears about 1 tonne of pods (Palmer and Pitman, 1972). Pods are large and twisted, about 10 x 2.5 cm, and do not burst open. They can be collected directly from the tree or from the ground.

Seeds ripen in January. Remove seeds from the pod and winnow. Seed stores well and may be kept almost indefinitely in a cool insect free place. Pretreatment is needed to break dormancy. These methods are recommended: soaking in hot water for 24 hours, soaking in concentrated sulphuric acid for 20 minutes (Nwoboshi 1982), or scarifying or nicking the hull. Plant directly after treatment. Germination is good and initial growth is quite fast (Teel 1984).

Seedling Management : Seedlings cannot be dug up and transplanted from the wild because of the long tap root. Success has been reported by sowing seed directly into the soil (Nwoboshi 1982). Direct sowing can be used by putting 3 to 4 seeds in well-cultivated spots at the start of the rains, on a well protected site. Planted seedlings tend to have higher survival rates. Since the tap root establishes rapidly, seedlings should be planted in large pots closed at the base and be transplanted while young, between 10 and 14 weeks after sowing (FAO 1988). Root pruning may be necessary before planting. Von Maydell (1986) suggests that seedlings should be transplanted to the final destination 3 to 7 months after sowing.

SILVICULTURE

Planting Types : *A. albida* is a deciduous tree, and drops its leaves at the onset of the rainy season. The leaves rapidly decompose to release nutrients at the time when young plants most need them. The tree remains leafless and does not cast enough shade to adversely affect crop grown beneath (Forest Division 1984). It is appropriate for dry land agroforestry in regions of 650 mm annual rainfall or 300 mm if deep ground water is available (FAO, 1988). In Muvumi division 30 km south of Dodoma, *A. albida*, *Adansonia digitata*, and *Acacia tortilis* form an essential component of the farming system.

It is recommended for the interior lowland zone as an alternative to *Leucaena leucocephala* for maintaining soil fertility in maize fields. In the semiarid zone it is recommended as a suitable tree in valleys with food crops. Livestock also can feed on the foliage and fruit in the dry season (Forest Division 1984).

Growth Factors : Slow initial growth but accelerates once taproot reaches ground water (Forest Division 1984).

Growth Cycle : In 8 to 10 years it can exceed 10 m in height and 10 cm in diameter dbh (Forest Division 1984). Its lifespan is between 80 and 100 years.

Management Systems : Wide spacing of at least 5x5 m, up to 10x10 m, is recommended to allow for intercropping with agricultural crops such as sorghum, cowpeas, or millet at a density of 100 trees per hectare. Pruning in the second year, to about half the tree's height may be needed to control low wide horizontal branching (Forest Division 1988).

ACACIA ALBIDA*

Young trees need to be protected from livestock for the first 5 to 8 years. Leaves can be susceptible to various insects, caterpillars, and locusts.

It coppices readily, but may become invasive. When generated by coppicing, height growth is considerably more vigorous than after seeding. Natural regeneration by seed is possible but requires protection against livestock (Von Maydell 1986). Transplanting of wildlings is not recommended because of long roots.

IMPORTANT USES

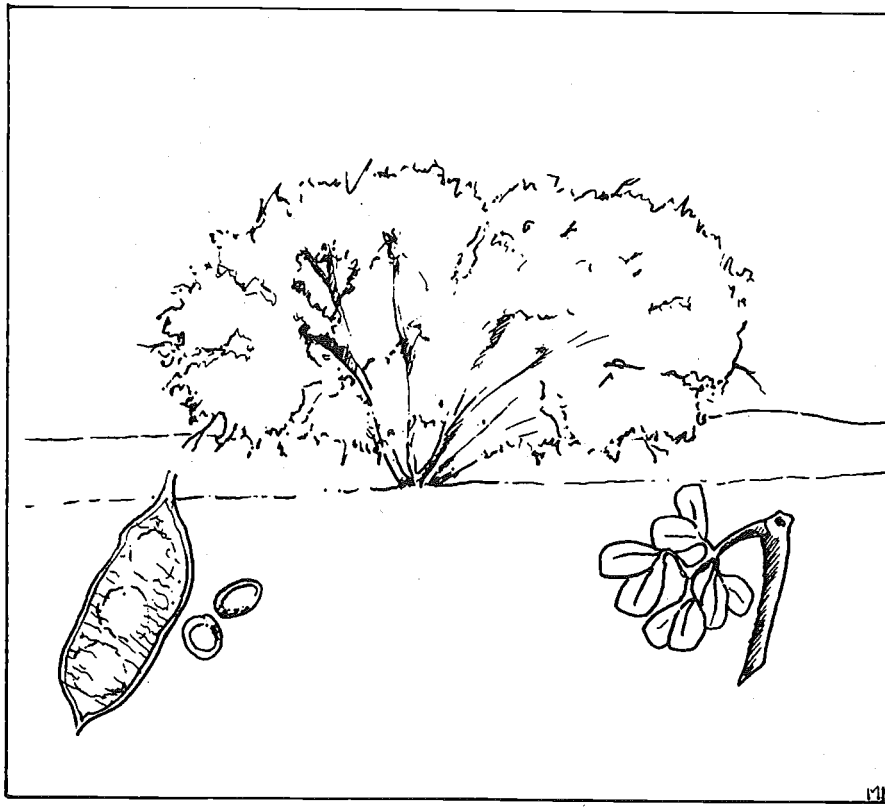
Use #1 : FODDER
Leaves and pods are used as fodder during the rainy season, a time when few other sources of browse are available. It is reported that cattle carrying capacity can double on land with numerous *A. albida* trees. Since leaves are retained during the hot season it provides valuable shade. It is estimated that a mature tree can supply up to 135 kg per year of seed pods (Watkins 1960).

Use #2 : MEDICINE
A decoction of the bark or root is used for coughing, fever, and diarrhoea; and the gum, bark, and leaves are used for diarrhoea, haemorrhage, and colds. Fruits are eaten to control diarrhoea. The bark is sometimes used to clean teeth and is believed to contain fluorine (FAO 1988).

Use #3 : LAND IMPROVEMENT
In parts of Dodoma region *A. albida, Adansonia digitata*, and *Acacia tortilis* are important parts of the farming system. *A. albida* is important as a source of nitrogen, and fallen leaves are important sources of humus. It is a good species to use in agroforestry for its ability to improve the soil because it drops its leaves at the beginning of the rainy season, providing nutrients to newly established crops. Since it is leafless at this time, shading of crops is not a problem.

OTHER USES : The fairly dense wood is frequently attacked by fungus, borers, and termites and is not as highly valued as that of other *Acacias*, even though the wood is used for housing construction and fence posts. It is also used for firewood and charcoal, though in some areas it is not highly regarded. The wood has a calorific value of 4700 kcal per kg dry wood (Webb 1984).

ACACIA MELLIFERA*



DISTRIBUTION

This shrub or tree under 7 m is found only in the very driest savannas. Widespread in all arid areas of Tanzania including wooded grasslands, Miombo woodlands, and saline thorn bushlands. It is found in Dodoma, Longodo Game Area, Kilimanjaro, Lake Manyara, Morogoro, and Tanga (Rulangaranga 1989). *A. mellifera* prefers sites in dry bush, in clayey soils, and in stony soil (Pitman and Palmer 1972). It is found on rocky hill sides with rainfall, or along seasonal water courses mixed with other trees.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1500
Minimum Rainfall (mm) :	250
Maximum Rainfall (mm) :	700

REQUIREMENTS

Soil Requirements : Found on hard surfaced, sandy-clay soils and rocky hill sides. Grows well in black cotton soils (Westman, Draft). Prefers loamy soils (Von Maydell 1986).

Influential Factors : Can form dense impenetrable thickets (Palgrave 1988).

PROPAGATION

Means of Propagation : Direct sowing by seed, wildlings.

Seeds per kg :	20000
Seed Sources : 1500 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Pods are small, containing 2 or 3 seeds each, and grow in abundance. To break dormancy soak in concentrated H_2SO_4 for 5 to 15 minutes (Von Carlowitz 1986).

SILVICULTURE

Planting Types : Live fences and boundary plantings. It is recommended as an agroforestry species in Tanzania.

Growth Cycle : Spreads rapidly.

Management Systems : Coppicing, though it was reported by Dale and Greenway (1961) that it does not coppice well. It is a difficult species to kill with bark spray arboricides (Dale and Greenway 1961).

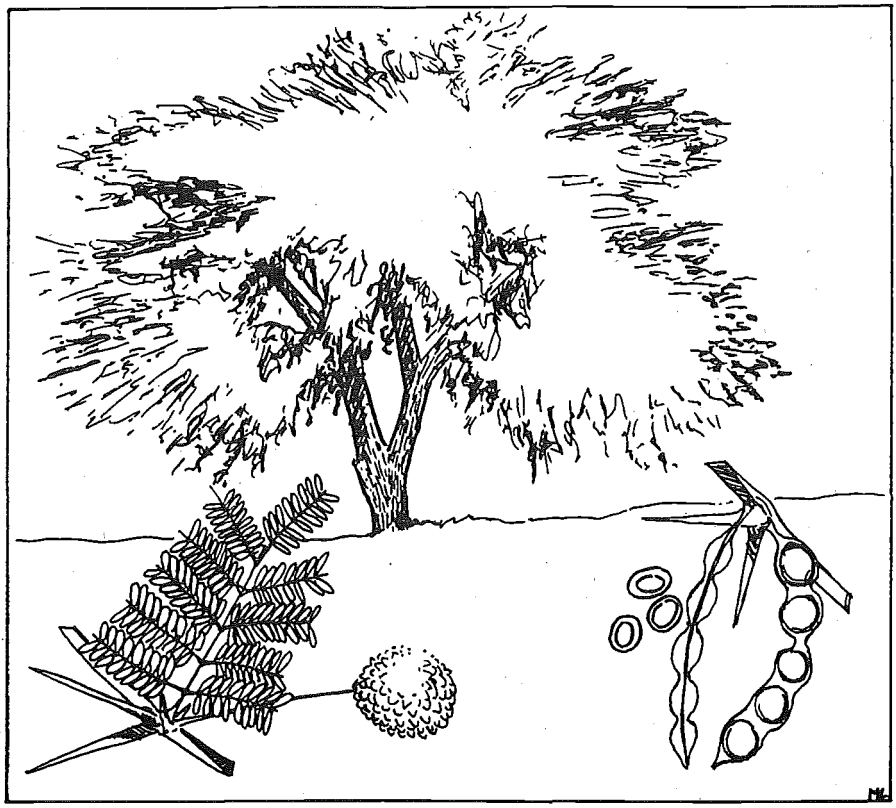
IMPORTANT USES

Use #1 : BUILDING MATERIALS
It is well-known as a durable material for construction, house building, and fencing. In Dodoma it is used to make support poles for grapes. It is termite resistant.

Use #2 : MEDICINE
The liquid of boiled bark is used to treat stomach problems, sterility, pneumonia, malaria, and syphilis (Rulangaranga 1989).

Use #3 : LIVE FENCE
Makes very good live fences and hedges. Goats often browse the leaves which are high in protein (Von Maydell 1986).

ACACIA NILOTICA*



DISTRIBUTION

Is one of the most widely distributed of the *Acacias*, and is tolerant of a range of conditions. It prefers savannah sites including wooded grasslands, Miombo woodlands, deciduous woodlands and costal bushland. *A. nilotica* is found in Dodoma, Tanga, Morogoro, Mbeya, Coast Region and Dar es Salaam (Rulangaranga 1989).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	500
Minimum Rainfall (mm) :	200
Maximum Rainfall (mm) :	1500
Maximum Temperature (C) :	50

REQUIREMENTS

Soil Requirements : Grows on sandy loam fine-textured soils, coastal sandy, rocky, soils, heavy clays, or black cotton soils (RSCU 1992). It is also found on loamy lateritic or calcareous sites (Von Maydell 1986).

Light Requirements : Strongly demanding.

Influential Factors : Susceptible to fire, frost, and browsing by livestock. Tolerates seasonal flooding and thrives with a certain amount of seasonal waterlogging (Teel 1984). Mature trees are killed if flooding lasts more than 8 months. It can withstand drought. Resistant to termites but liable to attack by various wood borers and *Bruchid* beetles attack

seeds (Webb 1984). Can form thickets (Palgrave 1988).

PROPAGATION

Means of Propagation : Direct sowing, cuttings, or nursery seedlings.

Seeds per kg :	5000-10000
Germination Rate (%) :	75-95
Germination Length :	7 days
Seed Sources : 1500 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Pods are long and pendulous. They are mature after turning from green to black, and have a strong, fruity smell. Each pod contains 10 to 15 seeds. The pods do not break open, but disintegrate on the ground. Collect seed pods from 5 to 7 year old trees and dry in the sun. Separate seed from pods by beating with a stick and clean by winnowing. Separate also through immersion in water. Clean seed may be stored in gunny bags, tins, or baskets in a cool dry place. If stored in air tight containers there is little loss in germination for up to 3 years (Parkash 1991).

Fresh seeds need no pretreatment but older seeds should be nicked and/or soaked for 24 hours in water or in H_2SO_4 for 5 to 15 minutes (Von Carlowitz 1986, Teel 1984). Alternative methods include keeping the seed in a moist cow dung-heap for 2 to 3 days or by feeding the pods to sheep and goats and then collecting the seed from their droppings. Treated seed should be planted promptly, and not allowed to be stored nor become dry (Parkash 1991).

Seedling Management : Requires 14 to 18 weeks in the nursery before outplanting, which should coincide with the rainy season (Weber and Stony 1986). Sow in polyethylene pods in March or April, or preferably, in situ. If direct sowing, place 3 seeds per pit and thin out when 60 cm high.

SILVICULTURE

Planting Types : Afforestation and enrichment planting. It is recommended for agroforestry in arid and semiarid areas and for erosion control.

Growth Factors : Grows vigorously with a wide ranging root system. It may become invasive (Palmer and Pitman 1972). It is medium to fast growing on good sites. Growth is rapid when soil moisture is adequate.

Growth Cycle : Short lived (Webb 1984). Long foliation during dry season (until end of February) indicates that it is desirable to have a high ground water table (Von Maydell 1986).

Management Systems : Avoid excessive watering. Seedlings are susceptible to damping off. Shading is necessary to prevent surface drying (Parkash 1991). May be outplanted in pits 30 to 50 cm^3 deep, spaced 3x3 m or 4x4 m. Linear spacing is 5 to 10 m, such as along roadsides, using 1 year old seedlings (Parkash 1991). Spacing of 2x2 m is also recommended. When young, this is a good intercropping species.

Regular thinning can be done on a 5 year cycle in the 5^{th}, 10^{th}, and 20^{th} years. Spacing between the trees should be roughly equal to their height (Parkash.1991). Lopping and pollarding are also common management techniques.

Careful weed control in plantations is necessary. Weeding is essential for 2 years since young plants do not compete well with grasses or weeds. Plants should be protected against flood inundations and stagnant water during the early years. Goats can cause damage in young forests so fencing of areas under regeneration is essential. After about 1 year, cattle do not cause much damage, and may even help in keeping vegetation down. The area can be opened to cattle once established.

ACACIA NILOTICA*

IMPORTANT USES

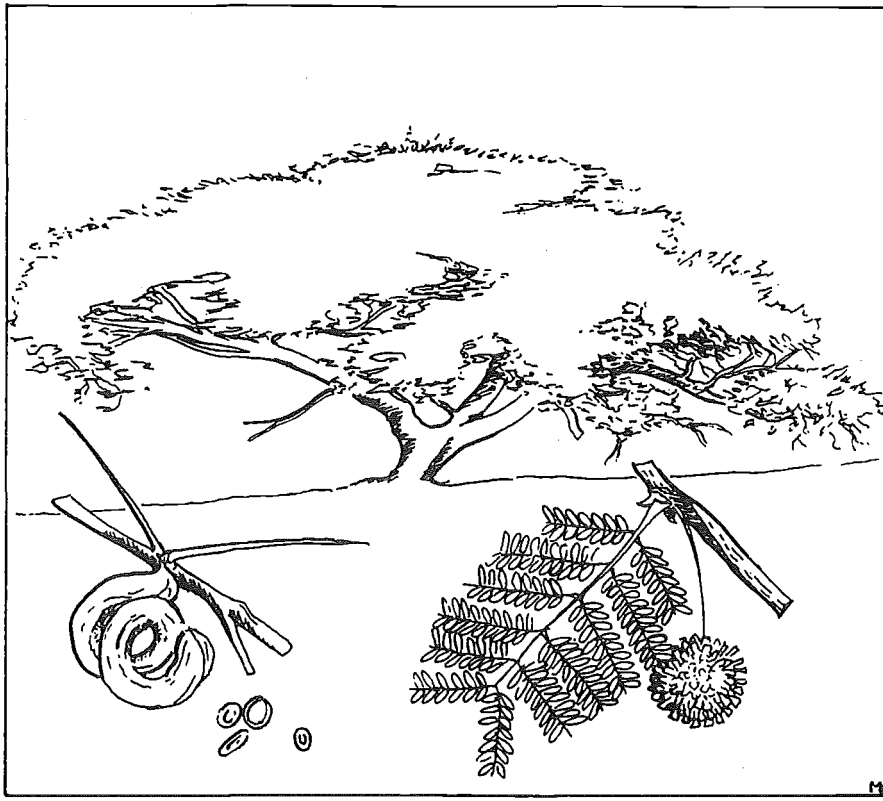
Use #1 : MEDICINE
The Gogo Tribe consider *A. nilotica* to be very important for medicinal purposes and various medicinal uses are reported in the literature. Those mentioned specifically for Tanzania include: juice from phloem strands is used for treating sore throats, leaves are boiled in a tea for chest pain and pneumonia, and boiled roots are used for stomach problems (Rulangaranga 1989). Other uses mentioned include using powdered roots mixed with water for toothaches, chest and stomach problems and to cure gonorrhoea. The bark and leaves are also used to treat colds, diarrhoea and dysentery. A drink is prepared from the liquid of boiled bark.

Use #2 : FUEL
The heartwood is especially valued for both firewood and charcoal. It has a calorific value of 4950 kcal per kg.

The wood is dense, heavy, termite resistant, and water repellent (Teel 1984). It is used for fencing, tool handles, and boat construction.

Use #3 : FODDER
Pods, leaves, and shoots are important sources of fodder. The leaves are reported to contain up to 12% protein and 21% crude fibre (Westman Draft). In some parts of India it is one of the most valuable fodder trees producing up to 80 kg of pods per year (Von Maydell 1986).

ACACIA TORTILIS*



DISTRIBUTION

Wide ranging in arid and semiarid areas of Africa. It is reported in most parts of Tanzania, but is more frequent in the north (RSCU 1992). It is common in dry savannahs and bushland, on sandy soils, and where rainfall is low. The preferred temperature is 20 to 25 degrees C with over 500 mm rainfall.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1500
Minimum Rainfall (mm) :	100
Maximum Rainfall (mm) :	1000
Minimum Temperature (C) :	20
Maximum Temperature (C) :	50

REQUIREMENTS

Soil Requirements : Accepts a wide range of soils if well-drained and non-saline. Prefers deep alkaline loams (RSCU 1992). It is also found on shallow soils and has colonized saline and gypseous soils (NFTA 1991).

Influential Factors : An extremely drought resistant species which can tolerate long erratic dry seasons, with very high daily temperatures. It can survive climates with less than 100 mm annual rainfall. Avoid seasonally waterlogged locations and those where inundations occur. It forms a very deep tap root in sandy soils (NFTA 1991). It also has extensive, long, lateral, shallow roots and may be blown over by strong winds. Young trees are susceptible to damage from frost and

by grazing animals, although older trees can withstand frosts and light grass fires (NFTA 1991). Trees are susceptible to attack by caterpillars, beetles and blight diseases (Parkash 1991). *Bruchid* beetles can destroy over 90% of seeds produced in a year.

PROPAGATION

Means of Propagation : Seedlings, wildlings, but primarily by seed. Coppices vigorously and tolerates lopping of large limbs. Abundant distribution though animal dung.

Seeds per kg :	10000 - 50000 (half after winnowing)
Germination Rate (%) :	40 to 65
Germination Length :	40 days
Seed Sources : 1800 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Pods are small and very twisted. Collect pods by picking or shaking from healthy trees before they open. Remove seeds from dry pods by trampling, or allow them to open during dry storage. Seeds should be cold stored in a dry, sealed container. It will remain viable for long periods. For even and high germination success, seeds need pretreatment. Pretreatment can be done by soaking in water at room temperature for 24 hours; soaking in H_2SO_4 1 to 2 hours followed by washing and then drying in the shade; or by soaking in hot (80 to 100 degrees C) water overnight. Teel (1984) reports that seeds are difficult to pretreat, being both hard to nick and responding poorly to soaking.

Germination in the nursery averages 25% and survival 50% (Parkash 1991). Once germinated, it grows and transplants well from the nursery (Teel 1984).

Seedling Management : Seed may be sown directly on site in mulched lines 5 m apart, or in patches (Parkash 1991). It is better to plant nursery-raised seedlings in containers in areas of erratic rainfall (Parkash 1991). For containerized seedlings, sow 2 seeds per pot. Young seedlings are sensitive to hot winds.

SILVICULTURE

Planting Types : *A. tortilis* is a good shade tree for people and for silvipastoral agroforestry uses in arid areas. It is not good for intercropping or near farmland due to wide, shallow roots (Teel 1984). Useful for sand dune stabilization, shelterbelts along canals and roads, and in sandy arid areas. It is recommended for semiarid areas on sandy soils with low rainfall, for fuelwood production (Forest Division 1984). It is considered a promising species in Dodoma. Plantations have been established in India.

Growth Factors. : Initially slow growth generally. The growth is relatively fast if planted with good seeds on good sites that are well-managed.

Growth Cycle : Pods ready for livestock at the end of the dry season. For the production of seed, fuel, and fodder, a rotation age of about 10 years is recommended by Parkash (1991). It lives 100 to 150 years.

Limitations to Planting : Can become a weed and should be introduced with caution. Usually not planted near houses since it is very thorny.

Management Systems : Containerized seedlings may be planted at about 10 months when 0.5 m to 1 m tall, in pits 60 cm^3. Recommended spacing is 3x3 m to 5x5 m, on sites with deep, sandy soil (Parkash 1991). Young plants in plantations as well as natural regeneration require protection from browsing for 3 to 5 years. Mature plants tolerate heavy browsing. Suppression of weed competition is essential initially (Von Maydell 1986).

ACACIA TORTILIS*

IMPORTANT USES

Use #1 : FUEL
Produces high quality firewood and charcoal (4400 kcal per kg) (Webb 1984). It is rarely used for building or timber as it warps upon drying and is often infected with borers.

Use #2 : FODDER
It is an excellent source of fodder and plants can survive heavy grazing. Pods are high in protein (15 to 20%) and are eaten from the ground by livestock and wildlife. Fruits are 19% protein and are readily consumed (Forest Division 1984). Leaves, new shoots, and seedlings are also browsed.

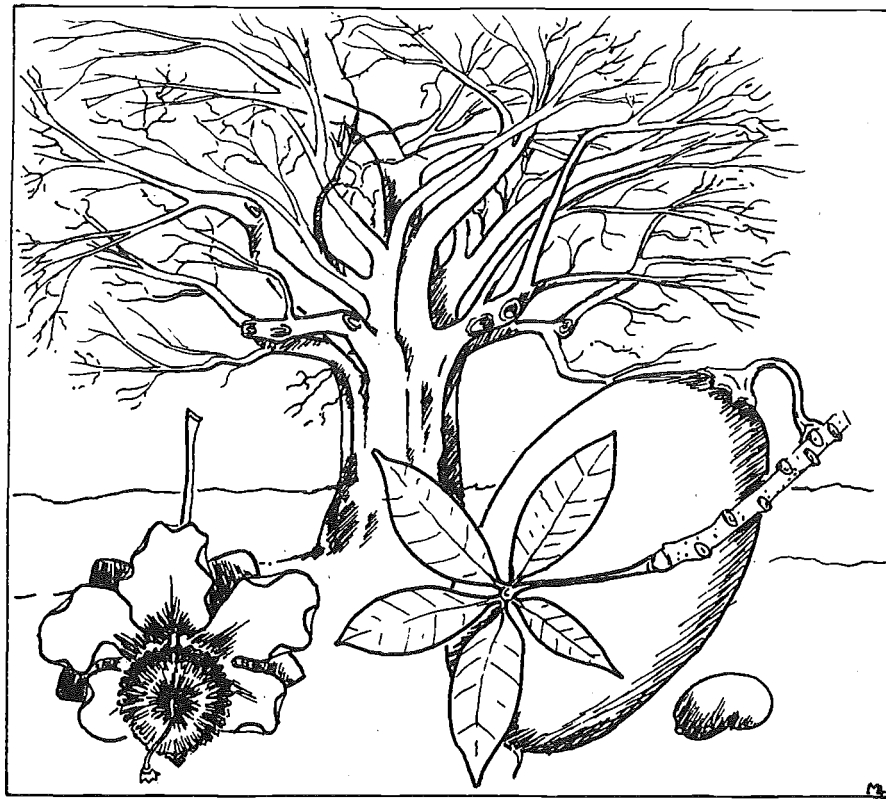
Use #3 : FENCING
Branches have 2 types of thorns, short brown ones and long white ones. Both thorny branches and posts are used as fencing material.

OTHER USES : The thorns are also used as needles and inner bark fibre is used for rope.

NOTES

In Indian field trials, it was found to be the fastest growing of the *Acacias*. Twelve year old plantations at 3x3 m yielded 54 tonnes of fuelwood per hectare and produced 900 kgs of fodder per hectare per year (Forest Division 1984).

ADANSONIA DIGITATA*



DISTRIBUTION

Tolerates a wide range of vegetation types including scrub, wooded savannah, hot, dry areas, and semiarid to subhumid tropics south of the Sahara. In Tanzania it grows from the coast to 1250 m (RSCU 1992). Prefers arid areas and well-drained sandy sites between 450 and 600 m above sea level, with a rainfall of 300 to 500 mm per year (Palmer and Pitman 1972).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1500
Minimum Rainfall (mm) :	90
Maximum Rainfall (mm) :	1500
Minimum Temperature (C) :	20
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Prefers sandy topsoil over loams, but can tolerate poorly drained heavily-textured soils. Does not occur on deep sands. Tolerates both acid and calcareous soils (FAO 1988).

Light Requirements : Strongly demanding.

Influential Factors : No serious pests or diseases are known to affect the tree. *A. digitata* can host many noxious crop insects. It is deep rooted, drought sensitive, and fire resistant. It prefers a high water table (RSCU 1992). The tree is often browsed by elephants.

PROPAGATION

Means of Propagation : Seedlings and cuttings.

Seeds per kg :	2500
Seed Sources : 800 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Fruits are very large, 10 to 26 cm long, and with a woody shell. Each pod contains about 100 seeds with a thick, hard coat. Fruits should be collected from healthy trees. Break open and extract black seeds inside, which ripen from December to February. Put the seed in water and remove any that float. Some sources say seed treatment is apparently unnecessary. The only effective pretreatment is to crack the seed coat, but this can damage the seed (Teel 1984). Other recommended methods are to immerse seed in boiling water, remove immediately and let cool, or boil in water for 5 to 7 minutes. Acid seed treatment could be tried (Von Maydell 1986).

Seedling Management : Germination is poor and the seed coat can be easily damaged. The germination period is extremely variable, between 3 weeks and 6 months. Seeds may take up to a year to germinate in the pot, but should germinate well in the nursery where adequate moisture can be provided regularly. In the wild, seeds are thought to germinate only in exceptionally good rainy seasons. Attempts to propagate vegetatively are reported to have failed, and planting by seed may be the only means of propagation. Seeds apparently keep their viability for years if stored in a cool dry place (Palmer and Pitman 1972).

SILVICULTURE

Planting Types : Found as isolated trees only, usually in or near settlements.

Growth Factors : Fairly fast growing once it is established (2 m height in 2 years and 12 m height in 15 years) (FAO 1988). Growth varies according to age, with young trees adding 30 cm per year in diameter, while older trees grow more slowly. Baobabs are sensitive to drought and even to a short dry season. At such times girth may actually diminish in size (Palmer and Pitman 1972).

Growth Cycle : One of the longest living trees in the world (3000 years). Fruits are edible from April through June; leaves are edible in October and November. Fruit is produced from 8 to 23 years onward (FAO 1988).

Limitations to Planting : Young trees are rarely found. Reasons may be due to the intensive browsing of young plants by livestock and the excessive use of leaves for food by people (Von Maydell 1986). Elephants find the whole tree palatable up to 3 years of age.

Management Systems : Should be transplanted at the beginning of the rains. Optimal spacing is thought to be 20 to 30 m apart. Needs to be protected against fire and browsing until well-established (FAO 1988).

ADANSONIA DIGITATA*

IMPORTANT USES

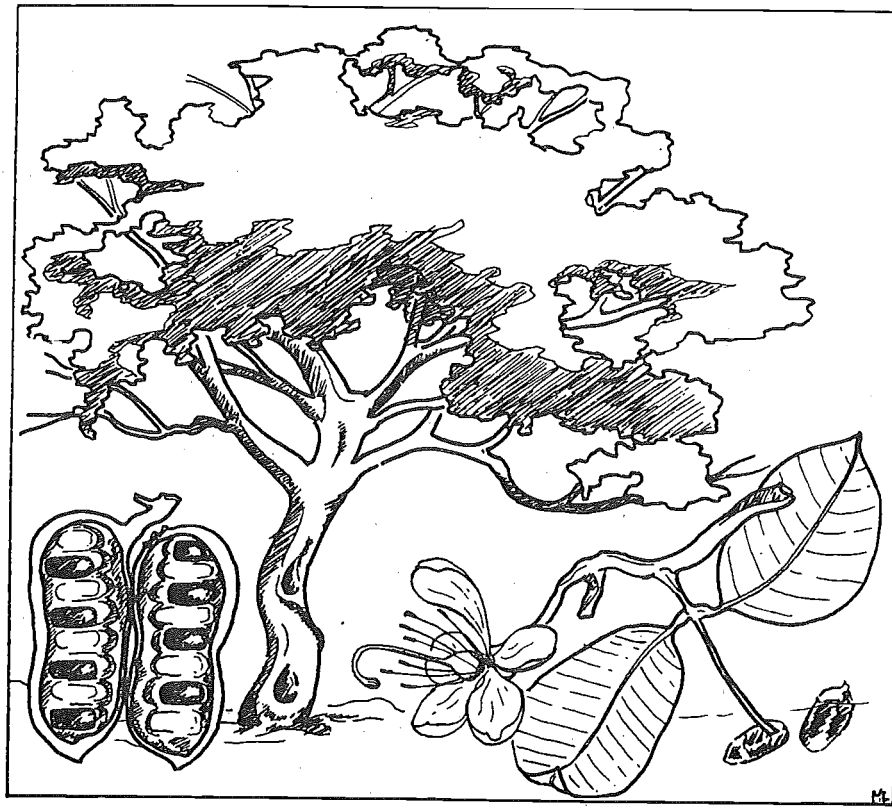
Use #1 : FOOD
The fruit, leaves, and flowers are very important in terms of their nutritional value. Both the fruit and leaves are high in vitamin C. The seed and flower are high in protein, and the kernel contains an edible oil. Fruits are commonly seen in markets throughout Tanzania. Young sprouts are consumed as a vegetable but are considered to be a famine food.

Use #2 : MEDICINE
The various parts of the baobab are used to treat a large number of ailments. Nearly every part of the tree has some medicinal value. A few include: powered bark mixed with porridge for malaria; the pulp of the fruit is mixed with honey and is used for coughing; the leaves are used for diarrhoea, fever, inflammation, kidney and bladder diseases, blood clearing, and asthma; the leaves also serve as emollients and are used to help extract guinea worm; the fruits and seeds are used for dysentery, fever, haemoptysis and diarrhoea; dry powered roots are prepared as a mash for malaria; and gum from the bark is used for cleaning sores (Westman Draft).

Use #3 : FIBRE
Bark fibres are used for making ropes, baskets, snares, cloth, strings for musical instruments, mats, and hats. The root bark also makes good rope. When the sap flows a section of bark can be unrolled, usually without hurting the tree.

OTHER USES : The baobab has over 30 uses and it is recognized as one of the most useful trees in East Africa. As a result it receives voluntary protection and local veneration throughout Tanzania.

AFZELIA QUANZENSIS*



DISTRIBUTION

A deciduous tree found in Miombo forests, lowland thickets, or dry woodlands (RSCU 1992). It is common in low lying areas and dry forests (Palgrave 1988).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1300

REQUIREMENTS

Soil Requirements : Prefers medium light soils, and well-drained soils that are not waterlogged.

Influential Factors : Deep rooted.

PROPAGATION

Seed Treatments : Pods are woody, large, and thick, up to 30x6 cm, and contain 6 or more hard, shiny black beans with a red aril. Collect pods from a healthy, desirable parent, and remove the seeds. Seeds may be stored if unopened, but once the hard woody pod opens, insects will destroy the seed. Produces many seeds. Good germination. No pretreatment is needed. Sow seeds directly in containers, and outplant after 4 to 6 months in the nursery (Teel 1984).

Seeds per kg :	250
Germination Rate (%) :	65
Seed Sources : 1500 TSH per kg - Tanzania National Seed Centre 1991.	

SILVICULTURE

Planting Types : Good shade tree due to a short bole and large leaves. Its ability to mix with crops is unclear (Teel 1984).
A. quanzensis has potential for agroforestry in Miombo woodlands (RSCU 1992).

Growth Factors : Slow growing, but can be relatively fast growing on appropriate sites.

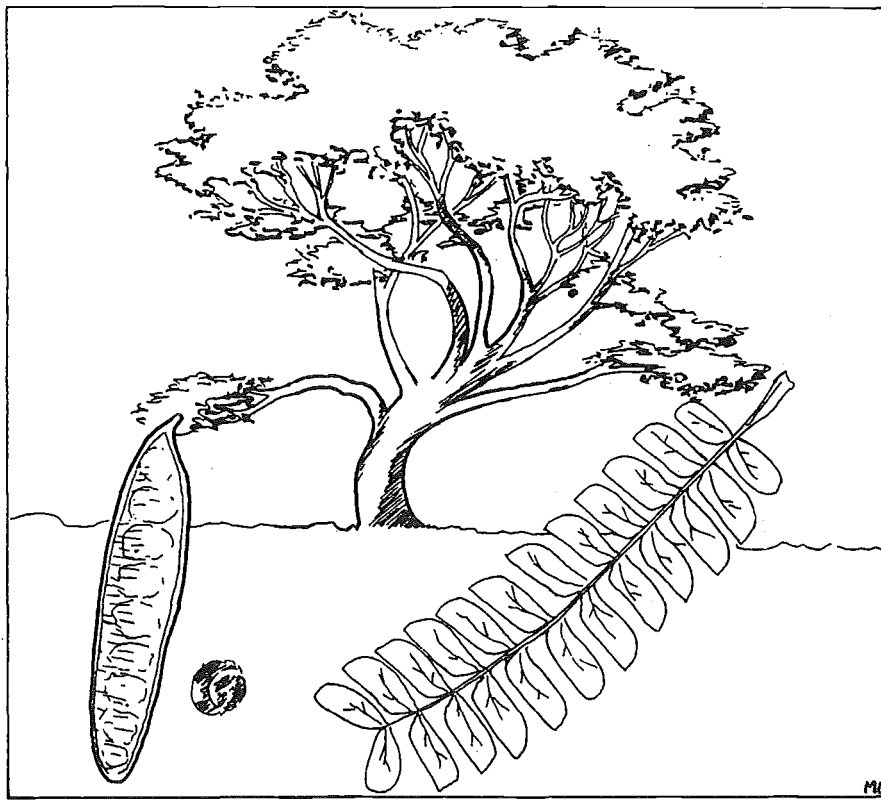
IMPORTANT USES

Use #1 : TIMBER
Heavily exploited and highly valued as timber, the wood is hard, heavy, durable, and termite resistant (Teel 1984). Light red wood darkens with exposure and has an interlocking grain. It is hard but easy to work and takes a high polish. The timber is valued for furniture and building materials, including doors, cabinets, and canoes.

Use #2 : FODDER
Leaves and pods are used as animal feed in Dodoma. The leaves are also edible by humans.

Use #3 : MEDICINE
The roots are used to treat chest pains, kidney problems, and for snakebites. A basic poison was found in the root by a government chemist in Dar es Salaam (Westman Draft). It has been reported that people have been killed by ingesting the roots.

ALBIZIA GUMMIFERA*



DISTRIBUTION

A deciduous tree preferring forest margins and open forests throughout mountainous regions in Tanzania, from the coastal hills to Kilimanjaro and Kagera (RSCU 1992). It grows poorly in higher areas (Teel 1984). It also occurs as a small tree colonizing mixed thickets and woodlands.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2300

PROPAGATION

Means of Propagation : Direct sowing of seed or sowing the pod when fresh.

Seeds per kg :	12000
Seed Sources : 1200 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : Pods are pale brown, up to 18x2.5 cm in size. Fresh seeds need no pretreatment. Soak previously stored seeds in cold water. Information about seed pretreatment for *A. lebbeck* suggests pretreatment by soaking in concentrated sulphuric acid for 5 minutes or soaking in cold water for 48 hours (Parkash 1991). Seeds can be stored for up to a year.

Seedling Management : Collect seed while still on tree to avoid insect damage.

SILVICULTURE

Planting Types : As single trees or in clusters near habitations, in fields, pastures and wetlands and along water courses. In Malawi, farmers intercrop *A. gummifera* as a shade tree among their tea bushes (Palmer and Pitman 1972). It has high potential for agroforestry (IFS 1989).

Growth Factors : Promising growth was reported in Dodoma region. In Zimbabwe it was reported to be fast growing, strongly fire resistant, and only slightly sensitive to frost (Palmer and Pitman 1972).

Limitations to Planting : Confined mostly to temperate zones, and is sensitive to frost.

Management Systems : Regenerates under its own shade (Sommerlatte 1990). It has good lopping and coppicing ability when young.

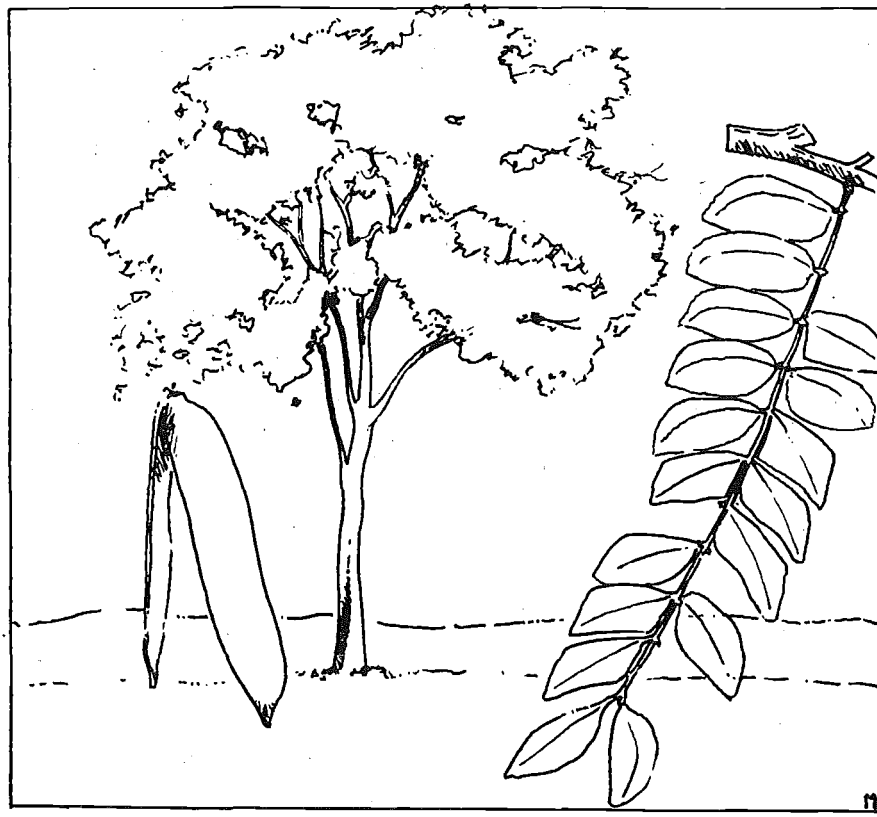
IMPORTANT USES

Use #1 : MEDICINE
Pods, roots, and bark are used for medicinal purposes.

Use #2 : GENERAL PURPOSE WOOD
The wood is medium dense, fairly strong, straight-grained, and does not warp. It works easily but is not termite proof nor water resistant (Sommerlatte 1990). It is useful as a general purpose timber and is used to make beehives, mortars, water troughs, and boats.

Use #3 : LAND IMPROVEMENT
A. gummifera is nitrogen fixing and can be used for soil stabilization. Its leaves form a good mulch and it is a good shade tree. It is recommended for alley farming systems, mixed cropping, and for plantation crop plantings with coffee and bananas.

ALBIZIA SCHIMPERANA*



DISTRIBUTION

It is widespread in Tanzania except in the west and south. It is well-known in the Usambara Mountains and on Mt. Kilimanjaro (RSCU 1992). *A. schimperana* performs well in cool conditions in mountain areas. It can survive in lowland areas with relatively low and constant temperatures, with mean annual temperatures in the range of 14 to 20 degrees C. Mean annual rainfall should exceed 1000 mm per year (Forest Division 1984).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2100
Minimum Rainfall (mm) :	1000
Minimum Temperature (C) :	14
Maximum Temperature (C) :	20

PROPAGATION

Means of Propagation : Seed (direct sowing and seedlings) and wildlings.

Seeds per kg :	8000
Seed Sources : 1200 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : Flowering occurs at the end of the dry season. Pods take about 5 months to mature, are dull brown, 15 to 35 cm in length and 2 to 6 cm wide (Forest Division 1984). Pods are very numerous, flat, papery, and oblong, up to 30x2.5 cm, and contain many seeds. Pods remain on the tree for long periods (Dale and Greenway 1961). Hot

water pretreatment or soaking in 75 degrees C hot water and cooling is suggested for even germination, but is not essential.

Stores for a long time if kept cool, dry, and insect free. Seedlings may be outplanted after 4 months in the nursery. Longer nursery periods are not advised because young seedlings are very susceptible to pests.

Seedling Management : Easily raised from seed. Seedlings grown from seed tend to thrive better than those raised from wildlings. The tree is also capable of regenerating under its own shade (Sommerlatte 1990).

SILVICULTURE

Planting Types : Can be planted in mixtures, in lines along contours separating strips of grass or food crops on slopes (Forest Division 1984).

Growth Cycle : Fast growing.

Limitations to Planting : Susceptibility to pests could be a problem.

Management Systems : Pure stands should be avoided due to pest problems. It performs better when planted under or among other trees and it is best to plant at wide intervals in lines along contours separating grass or food crops. Seedlings are ready for outplanting after 4 months the in nursery. Due to susceptibility to pests, long retention in the nursery should be avoided. Height reaches about 20 m (Forest Division 1984).

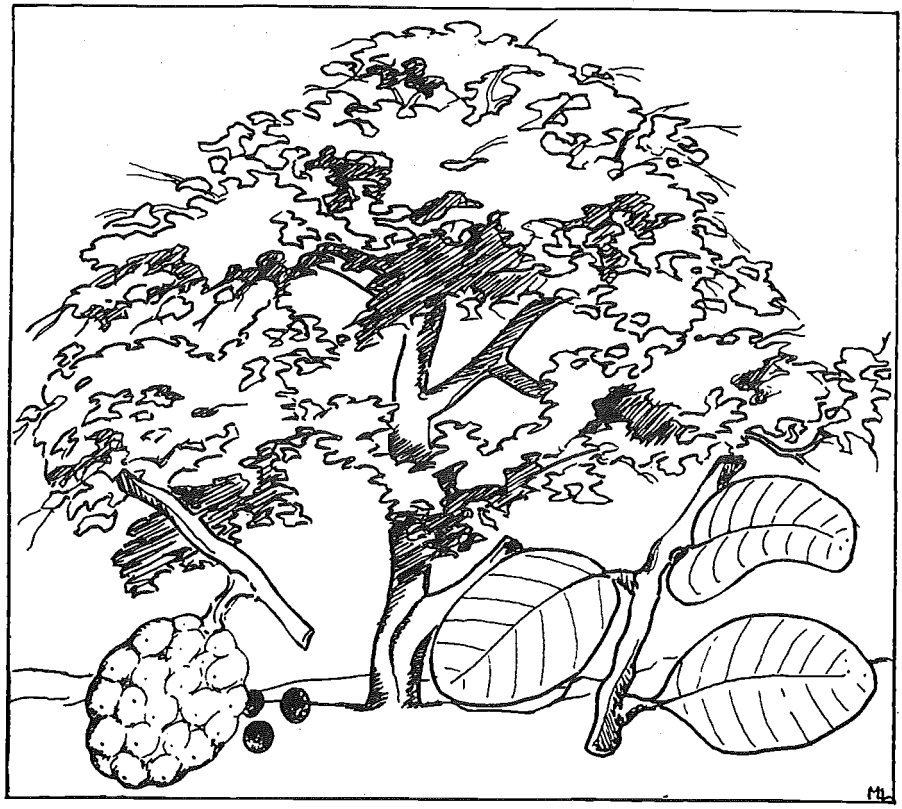
IMPORTANT USES

Use #1 : MEDICINE
An infusion of the roots is added to porridge and drunk for headaches and as a pain reliever. The stem bark is also used in a preparation to treat warts. (Chhabra et al. 1984).

Use #2 : LAND IMPROVEMENT
A. schimperana is believed to fix nitrogen, is used to improve soil conditions, and for shade.

Use #3 : GENERAL PURPOSE WOOD
The wood is fairly strong, works easily and is termite proof (Sommerlatte 1990). Wood is suitable for tool handles, needles, and building materials.

ANNONA SENEGALENSIS*



DISTRIBUTION

Found within semiarid and subhumid regions as a single shrub in the understorey of: savannah woodlands; open bush; along rivers; mixed scrub and rock at low to medium altitude; and in swampy forest in high rainfall areas. It is adaptable to a range of zones, including bush, savannah, and open patches of forest (Palmer and Pitman 1972). It is widely distributed throughout Tanzania where it grows in wet lowland savannah by the coast, in the Usambaras and in Lake Victoria basin. *A. senegalensis* is found in Tanga, Tabora, Iringa, Ruvuma, Morogoro, Mbeya, and Coast regions. It is widespread in *Brachystegia* and *Combretum* woodlands (FAO 1983).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	600
Maximum Rainfall (mm) :	2030
Minimum Temperature (C) :	19
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Tends to favour sandy soils (Palgrave 1988), but grows well in a wide variety of soils including stony soils, on river banks, fallow land, and along the coast on coral rocks with sandy loams.

Light Requirements : Strongly demanding.

Influential Factors : Frequently occurs in places subject to burning. It has sucker shoots that are an adaptation to frequent burning (Sommerlatte 1990).

PROPAGATION

Means of Propagation : Seedlings and wildlings. Natural regeneration is by seed, root suckers, and coppicing.

Seed Treatments : The solid, edible fleshy fruit resembles that of its close relative, the cultivated custard apple. It measures about 3x6 cm. Scarify seeds if raising seedlings in a nursery.

Seedling Management : No efforts have been made to raise this species in Tanzania, but seedlings can be raised in the nursery.

SILVICULTURE

Growth Factors : Moderately fast growing.

Growth Cycle : Flowers from October through December, but along the coast it flowers during December through February. The fruit matures during the long rains and is edible from January through March (FAO 1983).

Management Systems : Sites should be cleared of all vegetation before planting, and vegetation should be slashed during the first few years. Germination is good on recently cultivated and burnt lands.

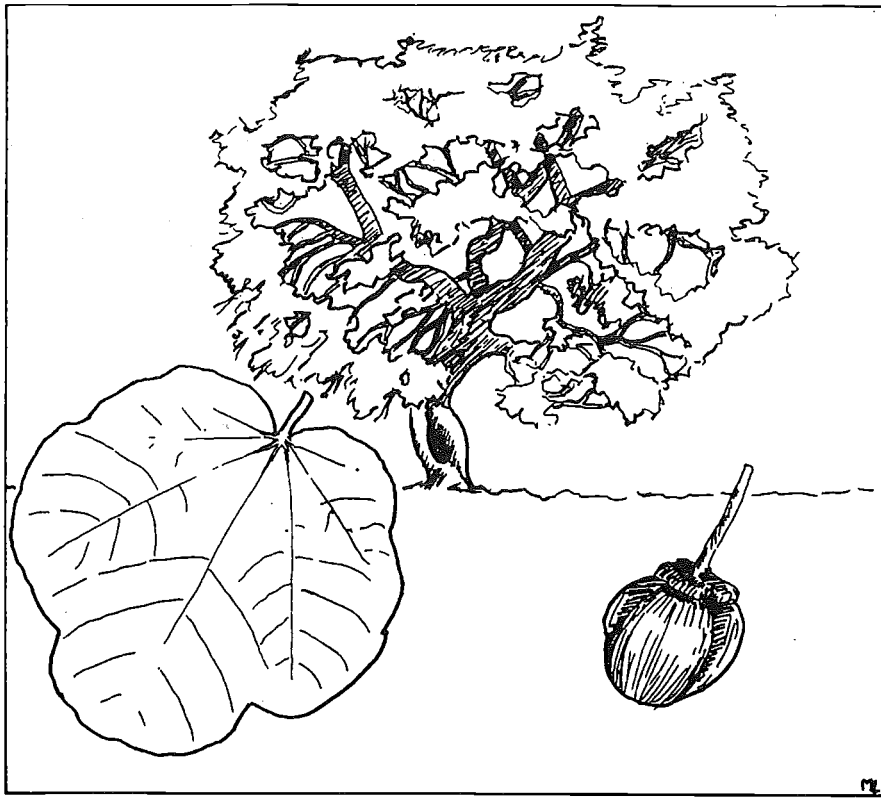
IMPORTANT USES

Use #1 : FRUIT
A. senegalensis is a well-known fruit that is sold in local markets. When eaten fresh, it is said to be one of the preferred fruits of Africa.

Use #2 : MEDICINE
The leaf tips and bark are used to treat colds and pneumonia, the fruits are used against diarrhoea, dysentery and vomiting, and the root is also used for stomach problems. The bark is prepared to treat intestinal worms as well as dysenteries and the gum is used to seal cuts (Rulangaranga 1989).

Use #3 : FODDER
The leaves are sometimes used as fodder and are browsed by elephants. The fruits are eaten by baboons.

AZANZA GARCKEANA



DISTRIBUTION

Found throughout the Tanzanian mainland in wooded grasslands, open woodland and thickets. It is particularly common in the woodlands of Babati and Singida (RSCU 1992). It grows naturally in a range of altitudes from 1000 to 2000 m above sea level, from semiarid areas to areas of higher rainfall. *A. garckeana* is often found on or near termite mounds in deserted village fields.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	250
Maximum Rainfall (mm) :	1270
Minimum Temperature (C) :	3
Maximum Temperature (C) :	17

REQUIREMENTS

Soil Requirements : Seems to prefer light yellow-brown to reddish-yellow gritty, sandy clay loams and often on black to dark grey clays and brown clays (FAO 1983).

Light Requirements : Strongly demanding.

PROPAGATION

Means of Propagation : Direct sowing, seedlings, root suckers, coppicing.

Seeds per kg :	4000

Seed Treatments : The fruit is a green, hard round capsule about 5 cm in size with an outer rind and glutinous inner flesh with brown seeds. The fruits ripen on the tree and must be picked off as they do not fall (Tredgold 1986). Pretreatment is reported not necessary by one author (RSCU 1992), although others report that seeds need scarification in order to germinate (Palmer and Pitman 1972).

Seedling Management : Naturally regenerates and germinates readily. It appears that it could be easily raised in the nursery and planted. However, natural regeneration may be better than seedlings (RSCU 1992).

SILVICULTURE

Planting Types : Palmer and Pitman note that in the wild the tree suckers very freely and may be unsuitable for a small garden. There is likely to be no adverse effects on crops due to a less extensive root system and a relatively small canopy.

Growth Factors : Fairly fast growing.

Growth Cycle : Flowers in wet season and fruits in dry season (April through August) (FAO 1983). Fruits are edible from September.

Limitations to Planting : Host to cotton stainer beetles and other bugs and is not grown in cotton producing areas (Palmer and Pitman 1972).

Management Systems : Site should be partially cleared before planting and intensive weeding is needed for the first few years (FAO 1983). Young plants should be protected from fire. Partial protection of woodlands would likely help the natural regeneration of this species. It is able to tolerate pollarding and coppices well.

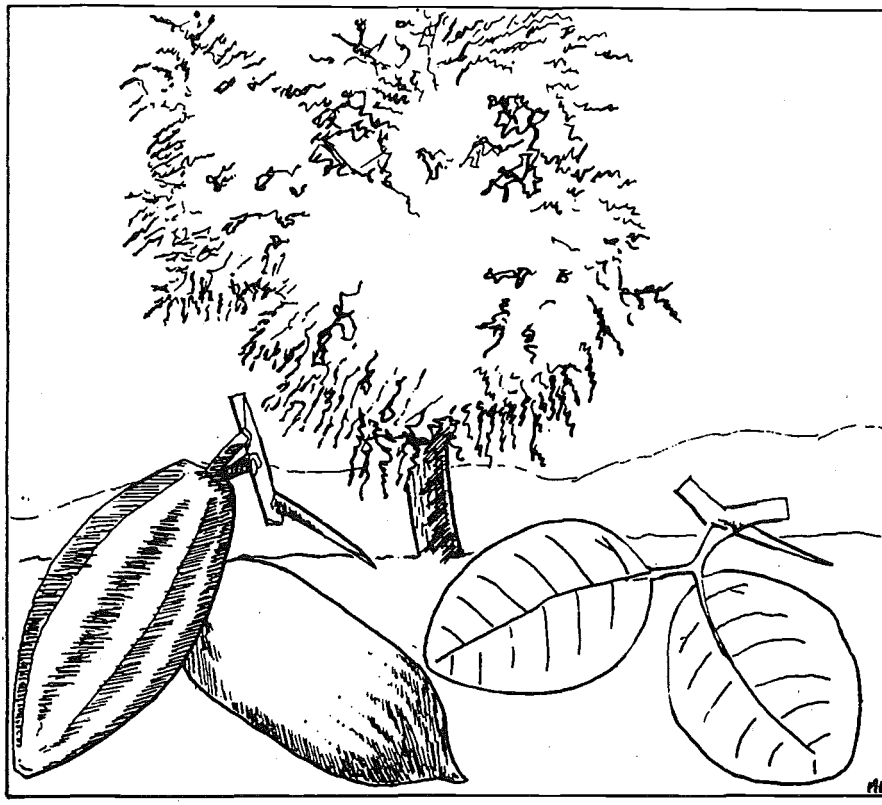
IMPORTANT USES

Use #1 : FRUIT
The whole fruit except the seeds is chewed like gum, producing a sweet glutinous slime. The fruit is also used as a syrup and soup.

Use #2 : GENERAL PURPOSE WOOD
The sap wood is yellow and the heart wood is a deep brown. It is easily worked but generally only suitable for small building needs, tool handles, oxen yokes, and domestic items such as spoons.

Use #3 : LAND IMPROVEMENT
The leaves of *A. garckeana* have many uses including green manure and mulch. The leaves also provide an often used fodder.

BALANITES AEGYPTIACA



DISTRIBUTION

Found in most arid, semiarid to subhumid tropical savannahs, and hot dry areas, along watercourses and in woodlands. It borders seasonally inundated black clay plains and grows well in valleys and on river banks in depressions, and on the slopes of rocky hills. *B. aegyptiace* is found in Mikumi, Selous, Lake Manyara, and Tarangire National Parks and Reserves (Rulangaranga 1989).

Minimum Altitude (m) :	300
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	200
Maximum Rainfall (mm) :	800
Maximum Temperature (C) :	40

REQUIREMENTS

Soil Requirements : Found on varied soils. It prefers valley soils but will grow in sand, sandy loams, clays, cracking clay, black cotton, alluvial, gravelly, and stony soils (RSCU 1992). *B. aegyptiace* is known to tolerate heavy clay soils (Teel 1984).

Influential Factors : Ecologically very flexible with excellent persistence. It withstands occasional flooding and is adaptable to a wide range of sites (Von Maydell 1986) and climatic conditions, but it can not tolerate prolonged waterlogging (Kew 1984). It has good drought tolerance (Hall 1991) and is not damaged by grass fires (except young trees), due to a deep tap root and thick bark. Invades areas having periodic fire and areas

with heavy livestock activity. Young plants are fairly termite resistant, but *Bunea alcinoe* defoliates the tree.

PROPAGATION

Means of Propagation : Seedlings, cuttings, potted stock and root suckers.

Seeds per kg :	1000
Germination Rate (%) :	60
Germination Length :	7 to 48 days
Seed Sources : 1000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Fruit turns from green to yellow when ripe, each containing 1 pit. These can be stored for up to a year if kept air dry and insect free. When ready to plant, soak the fruit overnight in lukewarm water until the pulp can be removed and the pit extracted. Recommended pretreatments include: intestinal scarification; boiling 7 to 10 minutes and cooling; soaking 12 to 18 hours in hot water; soaking for 24 hours in warm water; and soaking overnight in warm water (FAO 1988).

Seedling Management : Does not withstand transplanting well because of the deep tap root. For best results plant in a container with the seed vertical (stem end down) (Teel 1984). Plants should remain in the nursery for 18 to 24 weeks before outplanting at the beginning of the rainy season.

Because of the vigorous tap root, direct sowing at the end of the dry season is recommended. Average rooting success from stem cuttings is about 60 to 70%. Seeds passed through the intestinal tract of ruminants germinate particularly well and can be gathered where livestock are kept overnight.

SILVICULTURE

Planting Types : Traditionally it has been, and still is, actively managed. It is planted in agroforestry along the banks of irrigation canals and as a boundary marker. The tree attracts numerous insect species and could be used in agroforestry as a trap tree (IFS 1989). *B. aegyptiaca* is worth considering for difficult sites, where water is the main limiting factor.

Growth Factors : Grows slowly and requires protection as a seedling (Teel 1984).

Growth Cycle : Slow growing but very resilient. Fruit and foliage appear at the height of the dry season (Hall 1991). It produces seed in August and September. The first fruit is harvested between years 5 and 8 with the yield increasing until year 25. It can live to more than 100 years.

Limitations to Planting : Attracts numerous insects which may be a limitation.

Management Systems : Requires weeding and protection from browsing up to the initial fruiting period (at least 3 years). Weeding is important due to slow growth, (FAO 1988) as high grass can compete for light. Weeds can also impede regeneration and grass fires can destroy young plants.

It coppices vigorously. Roots spread far, and throw up suckers at a considerable distance from the trunk (Stewart and Brandis 1972).

IMPORTANT USES

Use #1 : MEDICINE
The fruits have been used in the treatment of liver and spleen diseases. The fruit is also known to kill the snails which carry schistosomiasis and bilharzia flukes (Tredgold 1986). The roots are used for abdominal pains and as a purgative. Gum from the wood is mixed with maize meal porridge to treat chest complaints.

Use #2 : FRUIT
The fruit pulp though bitter, is edible. It produces fruit even in dry years which makes it a highly appreciated food source in dry areas. Pounded fruits make a refreshing drink which becomes alcoholic if left to ferment.

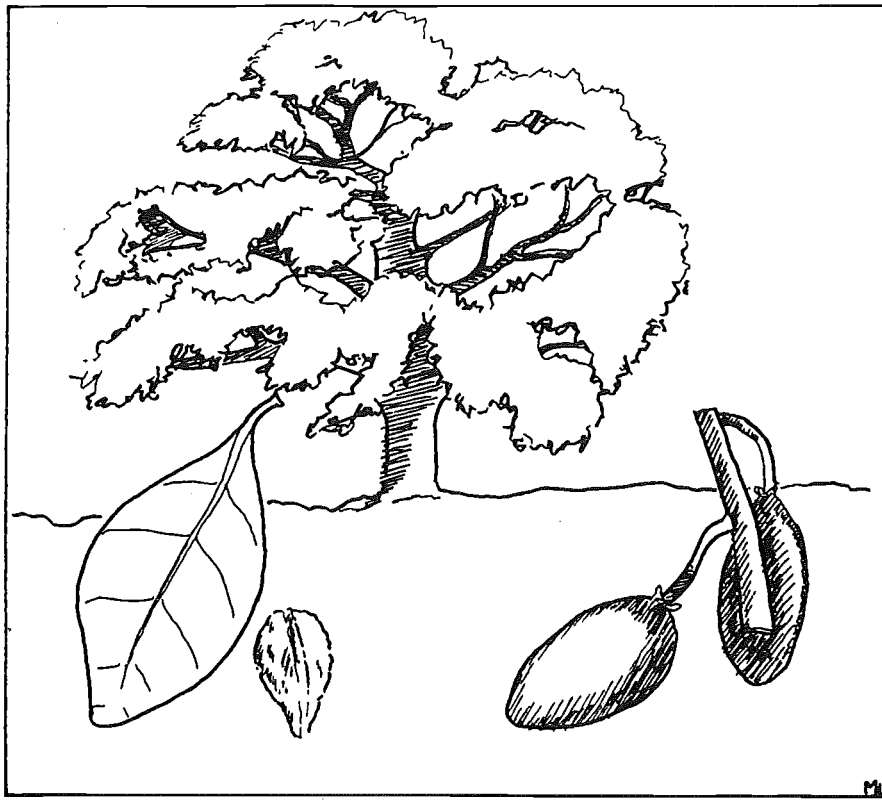
BALANITES AEGYPTIACA

Use #3 : GENERAL PURPOSE WOOD
B. aegyptiaca has fine-grained, dense, and heavy heartwood. It is easily worked and takes a good polish. Although valued for furniture, it may be twisted and difficult to saw. The wood is durable and resistant to insects making it good for tool handles and domestic items such as spoons.

OTHER USES : Root cuttings readily form a live fence. Protein rich leaves and shoots are an excellent source of fodder. The leaves make very good mulch and the tree is nitrogen fixing.

It is also valued as firewood since it produces almost no smoke and has a calorific value of 4600 kcal per kg (Webb 1984).

BERCHEMIA DISCOLOR



DISTRIBUTION

The tree is widespread and scattered in open woodlands or at lower altitudes, along river valleys, and in sandy soil in woodlands (RSCU 1992). It also grows on termite mounds. *B. discolor* is found throughout Tanzania including Tabora, Mpwapwa, and Morogoro, but not in mountain forests (FAO 1983).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	250
Maximum Rainfall (mm) :	1270
Minimum Temperature (C) :	17
Maximum Temperature (C) :	28

REQUIREMENTS

Soil Requirements : Sandy clay loams. It is often found on clays, and stream valley and riverine soils.

Light Requirements : Strongly demanding.

PROPAGATION

Means of Propagation : Seed, root suckers and coppicing.

Seed Treatments : The fruit is found in small drupes about 1 to 2 cm long, turning yellowish in colour when ripe. The fleshy pulp surrounds a kernel with 2 hard seeds (Tredgold 1986). Ripe fruits are collected

from the ground or picked from the tree. Germination takes some time due to the hard seed coat. Scarify seed or immerse in hot water and allow to cool for 12 hours (RSCU 1992).

SILVICULTURE

Growth Cycle : Fruit ripening occurs between January and March, towards the end of the long rains.

Management Systems : Partially clear vegetation initially and spot weed until seedlings are well-established. There may be a need for fertilizer since it is often found on termite mounds (FAO 1983). Protection from fire could promote natural regeneration.

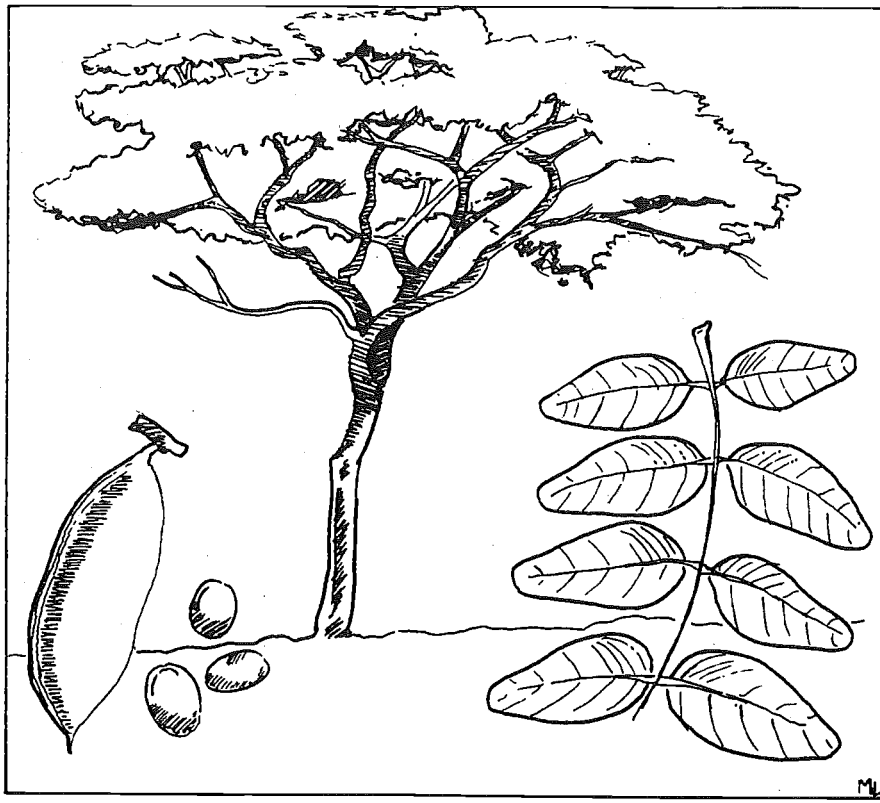
IMPORTANT USES

Use #1 : FRUIT
The fruits are eaten fresh and the pulp can be used for a drink. Both are quite nutritious as the fruit is very high in ascorbic acid and sugar.

Use #2 : GENERAL PURPOSE WOOD
The yellow-brown wood is one of the hardest in East and Central Africa. It makes excellent furniture, pestles, ladders, poles and is used in general construction.

Use #3 : DYE
The roots produce a black colour, the wood brown, and the bark red.

BRACHYSTEGIA SPICIFORMIS*



DISTRIBUTION

A dominant and ecologically important tree occurring in open deciduous woodlands (Palgrave 1988). In Tanzania its range includes large areas of deciduous Miombo forest. It is widespread and abundant in all woodland areas of Tanga, the eastern and southern highlands, and near the lakes in the west (RSCU 1992). *B. spiciformis* prefers hot climates.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1200
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1200

REQUIREMENTS

Soil Requirements : Prefers sandy soil but is found on a variety of soil types.

Light Requirements : Prefers open areas.

Influential Factors : Sensitive to frost.

PROPAGATION

Means of Propagation : Can be propagated from seed and seedlings.

Seeds per kg :	2200

Seed Treatments : Fruits are yellow or reddish-brown woody pods up to 13 cm in length, which explode with a sharp crack, scattering the seed widely (Palmer and Pitman 1972). Seeds germinate easily without pretreatment.

Seedling Management : Seeds possess no dormancy and regenerate completely after starting. However, the seedlings are difficult to transplant.

SILVICULTURE

Planting Types : *B. spiciformis* is increasingly being cultivated and is recommended for agroforestry use in the Miombo areas of Tanzania.

Growth Factors : Slow growing.

Growth Cycle : The young leaves are very colourful in the spring. The tree bears flowers from August to November (Palgrave 1988).

Management Systems : *B. spiciformis* hybridizes easily with *B. glaucescens* and *B. microphylla* (Palgrave 1988).

IMPORTANT USES

Use #1 : FUELWOOD
B. spiciformis is widely used for fuel, both as charcoal and firewood. The tree is often heavily branched and in parts of southern Tanzania the hard wood is highly sought for these uses.

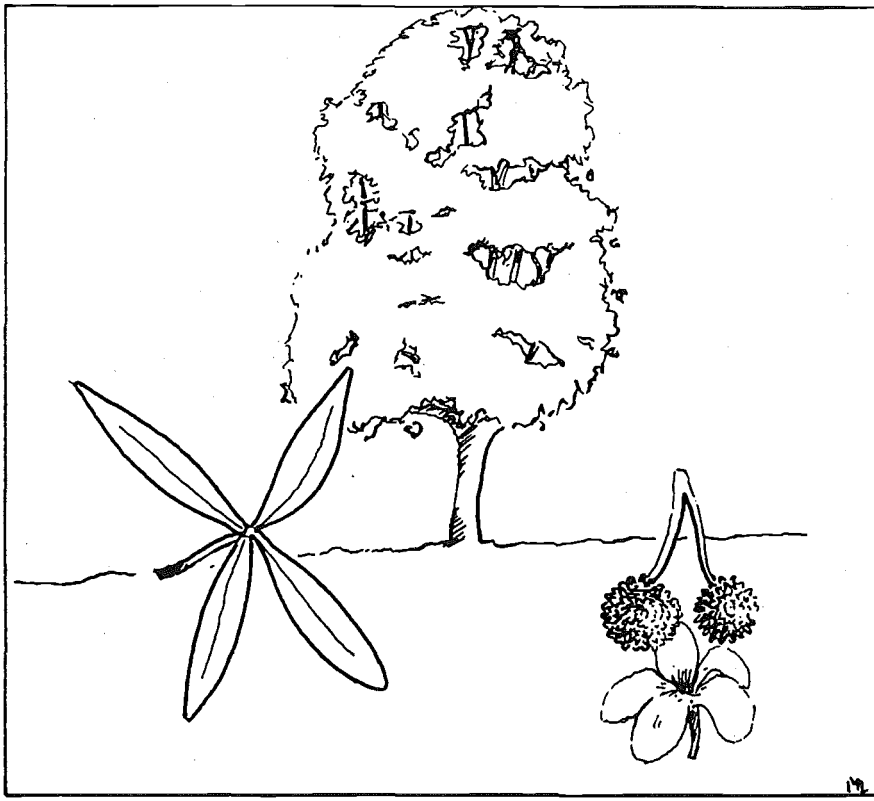
Use #2 : MEDICINE
In southern Tanzania *B. spiciformis* has several medicinal applications including using the roots to treat dysentery and stomach problems.

Use #3 : LAND IMPROVEMENT
It is an important shade tree. The leaves are known to be a good fodder and would likely provide good mulch. The species is nitrogen fixing.

OTHER USES : The wood is pale brown, hard, heavy, but not very durable. It is used for beehives, boats, and general construction. It is considered to be a rather inferior general purpose timber.

B. spiciformis is considered to be a good bee plant due to its sweet smelling flowers. The inner bark is used for local ropes.

BREONADIA SALICINA



DISTRIBUTION

Grows in moist valleys, riparian woodlands, along streams and rivers, and in swampy areas (Palgrave 1988).

PROPAGATION

Means of Propagation : Easily grown from seedlings. Cuttings placed in mud and wildlings are frequently used methods.

Seedling Management : Germination is more successful in moist conditions. In Ruvuma region, cuttings are placed in mud. Wildlings appear to have a higher survival rate than nursery seedlings, which need to be at least 1 m high to survive transplanting.

SILVICULTURE

Planting Types : Very high potential for agroforestry in valleys with coffee and other agricultural crops in southern Tanzania (RSCU 1992). It is also planted on hill sides for erosion control.

Growth Cycle : Fairly fast growing.

Management Systems : Can be planted successfully in mixed woodlots in single lines and in rows at 2x2.5 m in southern Tanzania. It appears susceptible to weed competition. However it may be more resistant to dry periods than the common fast growing trees of the area.

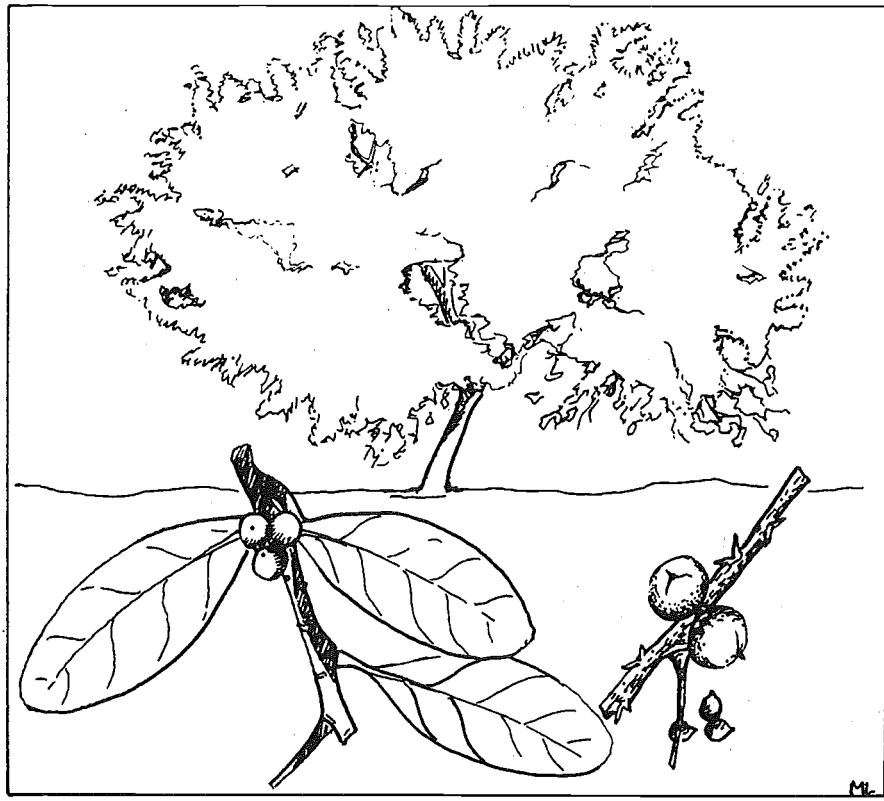
IMPORTANT USES

Use #1 : TIMBER
Wood is yellowish, hard, heavy, very durable, and oily to the touch (Palgrave 1988). It is also termite resistant. It makes an excellent timber which is highly valued for furniture and house construction. It is heavily exploited.

Use #2 : MEDICINE
Bark is soaked in water to prevent influenza fever. It is also used to cure stomach ailments.

Use #3 : FIREWOOD
It is a well-known firewood in southern Tanzania.

BRIDELIA MICRANTHA*



DISTRIBUTION

Found in forests by rivers, forest edges or open woodlands, savannahs and secondary forests, riverine woodlands, and gallery forests. It is adaptable to a variety of climates. The tree prefers sites along rivers and at forest edges at altitudes under 2500 m (FAO 1986). *B. micrantha* is found in Mbeya, Tanga, Kilimanjaro, Morogoro, and Iringa (Rulangaranga 1989).

Status : The tree is becoming scarce due to over exploitation (RSCU 1992).

Minimum Altitude (m) :	300
Maximum Altitude (m) :	2500
Minimum Rainfall (mm) :	800
Maximum Rainfall (mm) :	2500

REQUIREMENTS

Soil Requirements : Tolerates a wide variety from sandy clay loams to clay loams. It grows easily in deep, moist soil.

Influential Factors : A fast growing indigenous tree. It can withstand 5 to 6 degrees C of frost if sheltered (Palmer and Pitman 1972).

PROPAGATION

Means of Propagation : Seed and coppicing.

Seed Sources : 700 TSH per kg - Silviculture Research Centre 1991/92.

Seed Treatments : Fruits are small, oval, and turn from green to black when mature. Trees do not bear fruit each year. Pretreatment appears unnecessary (RSCU 1992). As an oil seed it has short storage viability. It may reproduce from cuttings as do other members of the *Euphorbia* family (Teel 1984).

SILVICULTURE

Planting Types : Commonly intercropped and managed by small scale farmers. It is not planted near homesteads as it attracts caterpillars and birds (RSCU 1992).

Growth Cycle : In Tanzania flowering occurs during the rainy season (October to March), with fruits ripening towards the end of the rainy season, extending into the dry season (April to July) (FAO 1986). Fruits are edible most of the summer.

Management Systems : It tolerates lopping, pollarding and coppicing. The crown is dense and broad, and not recommended for intercropping (Teel 1984). Coppices readily after trees are felled. Root suckers are produced if the roots are injured (FAO 1986). The tree is highly susceptible to competition from weeds.

IMPORTANT USES

Use #1 : FUELWOOD
It is regarded as one of the best fuelwood trees and is used for both firewood and charcoal.

Use #2 : GENERAL PURPOSE WOOD
A durable termite resistant wood that is in high demand for poles, tool handles, bows, and timber for interior carpentry.

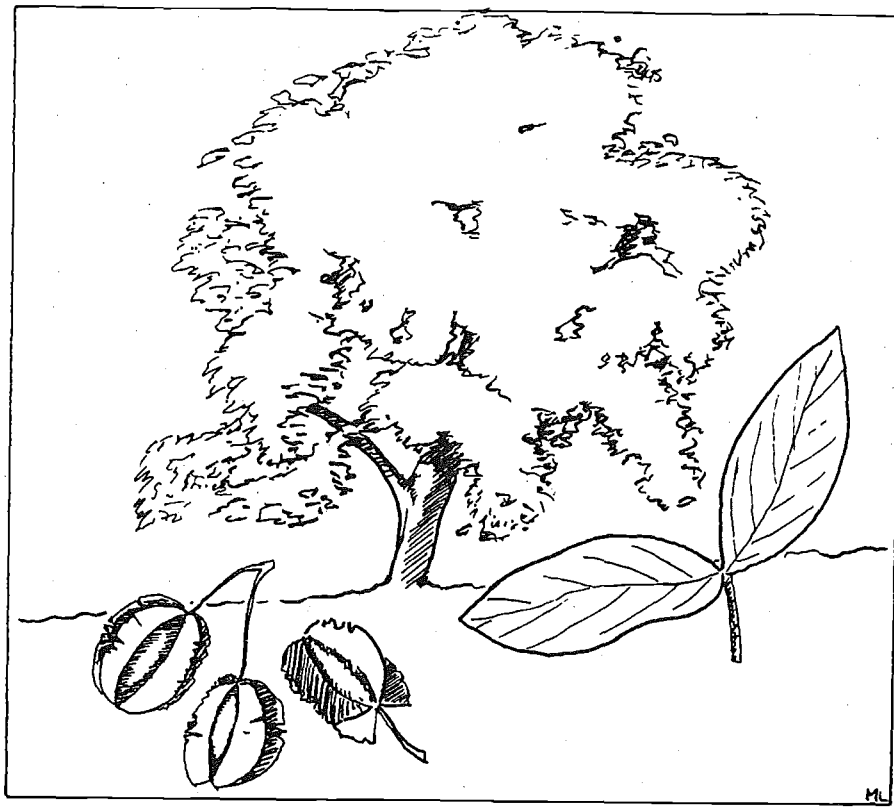
Use #3 : MEDICINE
The roots are crushed and used for treating stomach aches, tapeworms, diarrhoea, headaches, and sore joints (Rulangaranga 1989). The leaf sap is used for sore eyes.

OTHER USES : The fruits are sweet, tasting like currants and are readily eaten by children.

NOTES

The tree is host to hairy caterpillars which feed on leaves. In Nigeria and Uganda the tree is cultivated as food for silkworms, which produce a light brown silk (Tredgold 1986).

COMBRETUM MOLLE*



DISTRIBUTION

Common throughout Tanzania but more so within the coastal belt, in riverine forests, in wooded grasslands, and bushland. It is found on rocky sites and stony hills (RSCU 1992).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2300

REQUIREMENTS

Soil Requirements : Well-drained soils.

PROPAGATION

Means of Propagation : Seedlings and root suckers.

Seeds per kg :	10000 -15000

Seed Treatments : Pretreatment is not necessary. It germinates readily if seeds are fresh and not damaged by insects. Open fruit to extract seeds. It is reported to have a very short storage period (RSCU 1992).

SILVICULTURE

Growth Cycle : Slow growing.

Management Systems : Tolerates lopping and coppicing.

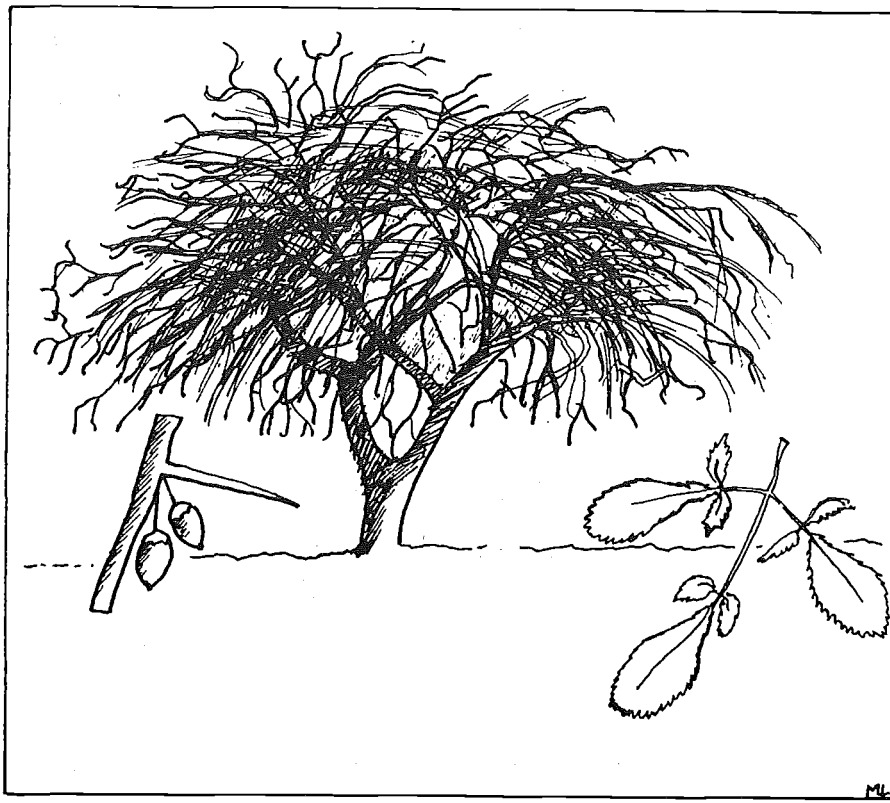
IMPORTANT USES

Use #1 : MEDICINE
A root decoction is use to treat abdominal pains and sterility (Chhabra et al. 1984). It is used to treat hookworms, stomach pains, snakebites, leprosy fever, and general body swelling (Rulangaranga 1989). It is regarded as a medicine for both humans and animals.

Use #2 : BEE PLANT
The sweetly scented flowers attract insects including honey bees.

Use #3 : GENERAL PURPOSE WOOD
The wood is hard and used as building posts, poles, tool handles, and in construction. It is also termite resistant.

COMMIPHORA AFRICANA



DISTRIBUTION

Found on dry sites throughout Africa. In Tanzania it grows in open savannah on rocky sites with minimal rainfall (RSCU 1992). It is reported to tolerate a wide range of sites, including hot, rocky river beds, wooded ravines, rocky ridges, lowland forests, and savannahs. It is found in Morogoro, Rukwa, Arusha, Selous Game Reserve, Shinyanga, Mikumi National Park and Tanga (Rulangaranga 1989).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1600
Minimum Rainfall (mm) :	300
Maximum Rainfall (mm) :	800

REQUIREMENTS

Soil Requirements : Grows on a wide range of soils including red dolerite, sand, rocky escarpments, boulders, clays, and lateritic crusts. It appears to grow best on calcareous soils and sands (Von Maydell 1986).

Influential Factors : Fire and fairly termite resistant.

PROPAGATION

Means of Propagation : Stakes, large cuttings, or seeds. It is easy to propagate with cuttings.

Seeds per kg :	8000
Seed Sources : 1000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : *C. africana* produces a pink-red fruit with stony seed inside. No treatment is recommended.

SILVICULTURE

Planting Types : Recommended for live fences and hedges in dry areas. Does not compete with crops.

Growth Factors : Slow growing.

Growth Cycle : Comes into leaf at the beginning of the dry season (Von Maydell 1986).

Management Systems : Tolerates lopping.

IMPORTANT USES

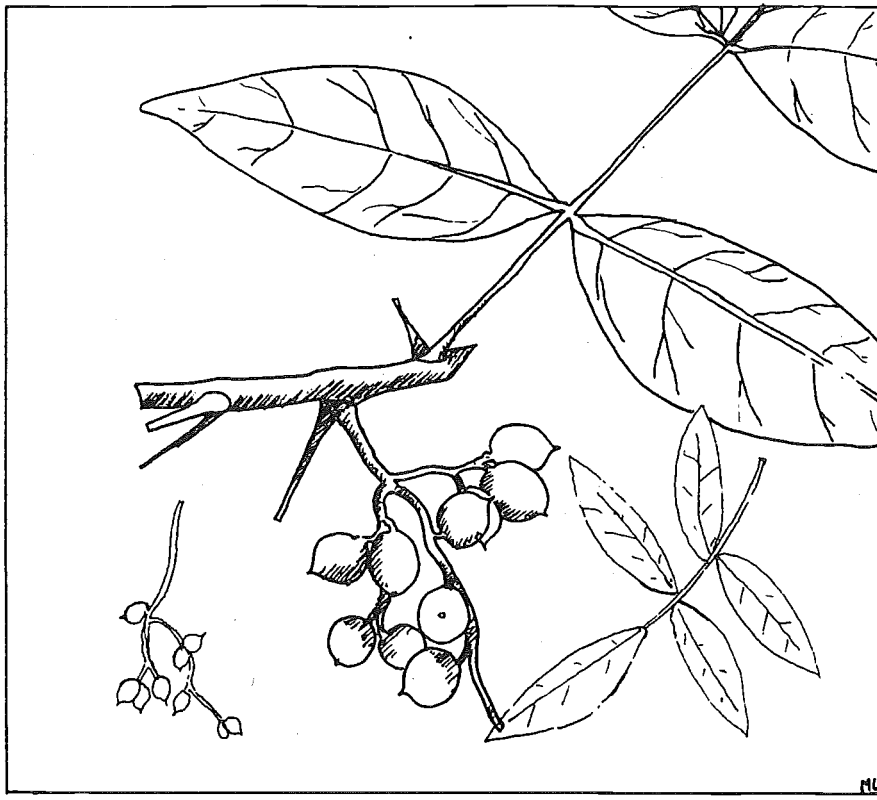
Use #1 : MEDICINE
Fruits are used for the treatment of typhoid fever and as a remedy for stomach problems (Rulangaranga 1989). The powdered bark is mixed with porridge to cure malaria. The resin also has medicinal uses including sealing and disinfecting wounds. It is applied as a plaster and used for spasms. The fumes of burnt resin are used as an insecticide (Westman Draft) and an aphrodisiac.

Use #2 : FODDER
The leaves are browsed by goats, especially at the end of the dry season when young leaves appear. The nutritive value of the leaves is about 8 to 14% crude protein (Von Maydell 1986).

Use #3 : GENERAL PURPOSE WOOD
The wood has a reputation of being termite resistant, though soft. It is used in the construction of local houses, tool handles, beehives, spoons, water troughs, and for musical instruments.

OTHER USES : Roots, leaves, and fruits are edible. An edible oil is also extracted. Dried sap and bark are used as incense.

COMMIPHORA EMINII



DISTRIBUTION

In Tanzania it is found from the Coast hill forests, the Pugu Hills Forest Reserve and Tanga, to Morogoro and Dodoma. It grows in lowland evergreen rainforests and woodlands (Rulangaranga 1989). It is found on rocky sites.

Status : Now becoming rare (RSCU 1992).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1500
Minimum Rainfall (mm) :	300
Maximum Rainfall (mm) :	1000

REQUIREMENTS

Soil Requirements : Prefers clay or sand.

Influential Factors : *C. eminii* has no adverse effects on crops due to a relatively less extensive root system and small canopy (RSCU 1992).

PROPAGATION

Means of Propagation : Large cuttings.

SILVICULTURE

Planting Types : Grown with food crops, in gardens, around homesteads. It is planted as a quick growing hedge.

Growth Factors : Fairly fast growing.

Management Systems : Tolerates pollarding.

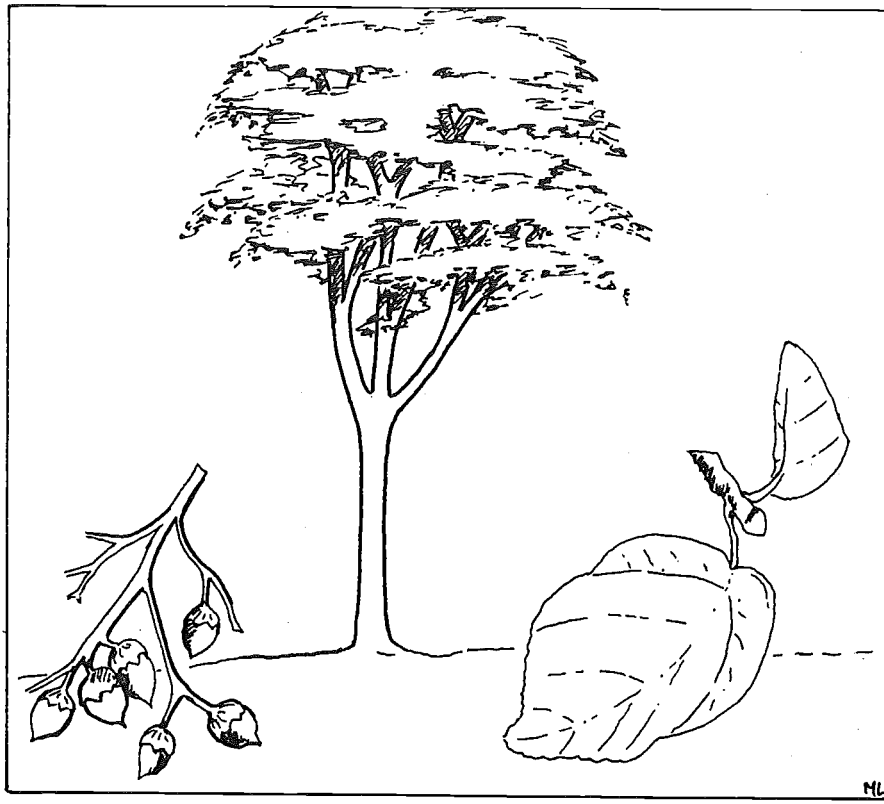
IMPORTANT USES

Use #1 : MEDICINE
It is used as a remedy for fever, snakebites, indigestion, constipation, and toothaches (Rulangaranga 1989).

Use #2 : FENCING
It is often propagated as a quick growing live fence for boundary marking and for yam supports. The wood is also used for fence posts.

Use #3 : GENERAL PURPOSE WOOD
The wood is easy to work and is used for beehives, building materials, and furniture.

CORDIA AFRICANA*



DISTRIBUTION

A small to medium sized tree (4 to 15 m in height) occurring at medium to low altitudes. It is often found in woodland and brush in warm moist areas, and along river banks (Palgrave 1988). In Tanzania it is common in pastureland, particulary in Arusha and Kilimanjaro regions but is scattered elsewhere (RSCU 1992).

Minimum Altitude (m) :	1200
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	1000

REQUIREMENTS

Soil Requirements : Found on a wide variety of soils. *C. africana* prefers light, deep, and well-drained soils and moist conditions. Also sandy loams (Watkins 1960).

Influential Factors : Irregular shedding of leaves which is often at different times from neighbouring trees (Watkins 1960). It is normally resistant to termites. It is frost tender.

PROPAGATION

Means of Propagation : Wildlings, transplants (6 months) and seed. Coppices well.

Seeds per kg :	3500
Germination Rate (%) :	65
Seed Sources : 1000 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : Fruit is small, smooth and oval tipped with a small point, about 1.3 cm in diameter (Palmer and Pitman 1972). Collect ripe fruits and sun dry until the coat is hard. Rub together to remove seed coat.

Pretreatment is not necessary. Germination is slow at first but fairly good after 3 weeks. The seed stores well for up to 1 year (Watkins 1960).

Seedling Management : Seeding time is highly variable but August and September appear best (Teel 1984). Seeds are normally sown directly in beds with germination beginning in 2 weeks. Seedlings need about 4 to 6 months in the nursery.

SILVICULTURE

Planting Types : Planted near dwellings, around fields and pastures, and as a shade tree.

Growth Factors : Moderate to slow growing.

Growth Cycle : *C. africana* has a rotation of 35 to 45 years. It produces seed from August to September (ICRAF 1992).

Limitations to Planting : The tree usually has poor form and a short bole.

Management Systems : Germination from seed appears to be erratic but once started the tree grows fast and well. It can reach 7 to 8 m in 7 years (Palgrave 1988) and can tolerate pollarding, lopping, and coppicing.

IMPORTANT USES

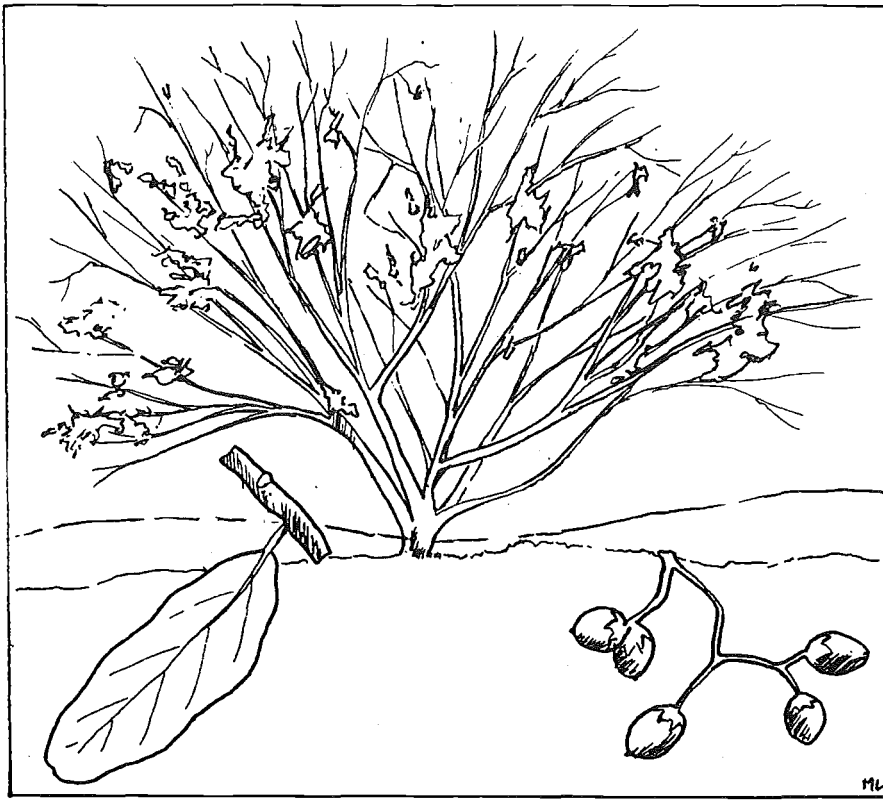
Use #1 : SHADE
Often found in cropland where it is managed for shade. In northern Tanzania *C. africana* is favoured as a shade tree for coffee because of its short bole. It provides very good mulch and can be used in other mixed cropping systems on cropland, pastureland, or rangeland to improve microclimatic conditions.

Use #2 : BEE PLANT
C. africana's sweetly scented flowers are very attractive to honey bees and are known for their high quality honey production.

Use #3 : GENERAL PURPOSE WOOD
The wood is light, yet durable, moderately soft, fairly straight-grained, and relatively termite and fungus resistant. It works and finishes easily (Watkins 1960). The wood is used to make grain mortars, water containers, utensils, tool handles, furniture, beehives, containers for local brew, and shingles.

OTHER USES : Well-known and valued for firewood, especially in the West Usambara Mountains.

CORDIA SINENSIS



DISTRIBUTION

Found in so called 'grong water bushland' in low altitude arid and semiarid areas. It prefers moist river beds but is also found on termite mounds and in littoral scrub. In Tanzania *C. sinensis* is found in the coastal areas and in the central and northern dry regions (RSCU 1992).

REQUIREMENTS

Requirements : Prefers moist river beds but can grow in stony or saline soils (RSCU 1992).

Influential Factors : Has adapted to withstand flooding, even prolonged flooding (Westman Draft). It is a useful tree in arid areas.

PROPAGATION

Means of Propagation : Direct sowing, seedlings, and cuttings.

Seeds per kg :	6500

Seed Treatments : Fruit becomes round and bright orange as it ripens, and hangs in conspicuous clusters. Fruit is pulpy and sticky, and about 2 cm long. No treatment has been recommended.

SILVICULTURE

Planting Types : Can tolerate a wide range of sites. Growth patterns range from compact, densely growing shrubs to small compact trees under 12 m.

Growth Factors : Fairly fast growing.

Management Systems : Tolerates lopping, pollarding, and coppicing.

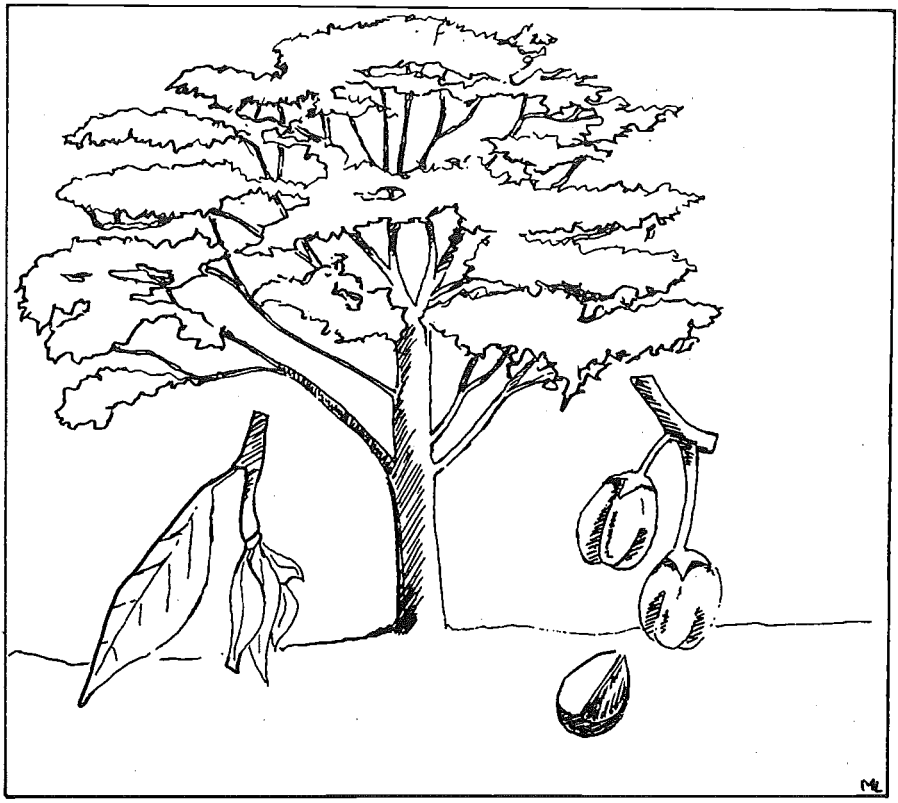
IMPORTANT USES

Use #1 : MEDICINE
The roots and bark are used for stomach disorders in both children and adults. A decoction of boiled roots is used to treat malaria. It is reported that 3 finger sized pieces of the root can cause an abortion (Westman Draft). Bark and roots are mixed to treat conjunctivitis in cattle.

Use #2 : FRUIT
Fruits are often put in porridge and are used as a sugar substitute.

Use #3 : GENERAL PURPOSE WOOD
In Dodoma it is used in the construction of local houses and for roofs. It is also used for tool handles, walking sticks, clubs, and stools.

CROTON MEGALOCARPUS*



DISTRIBUTION

Is a dominant upper canopy forest tree reaching heights of 40 m or more (Dale and Greenway 1961). It is widespread in the mountains of Arusha and Kilimanjaro.

Minimum Altitude (m) :	1300
Maximum Altitude (m) :	2200

REQUIREMENTS

Soil Requirements : Light, deep, and well-drained (Egli and Kalinganire 1988).

PROPAGATION

Means of Propagation : Direct sowing is recommended. Can also be propagated from seedlings and wildlings.

Seeds per kg :	1100
Germination Rate (%) :	85
Germination Length :	25 days
Seed Sources : 700 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : Produces large seed in capsules with 3 lobes, about 2 to 3 cm in length and 3 cm in diameter. Teel (1984) reports that germination is quick and that no pretreatment is required.

Seedling Management : Seeds cannot be stored for long periods because of the high oil content. The germination rate falls dramatically if seeds are stored for more than 9 months (Egli and Kalinganire 1988).

SILVICULTURE

Planting Types : Near dwellings, in fields, and by swamps and watercourses. Egli and Kalinganire (1988) advise to avoid intercropping because of its dense shade. However it is frequently found in Kikuyu agroforestry plantings in Kenya. In some areas it is not planted close to houses due to cultural beliefs (ICRAF 1992).

Growth Factors : Fast growing on appropriate sites.

Management Systems : Tolerates lopping, pollarding and coppicing.

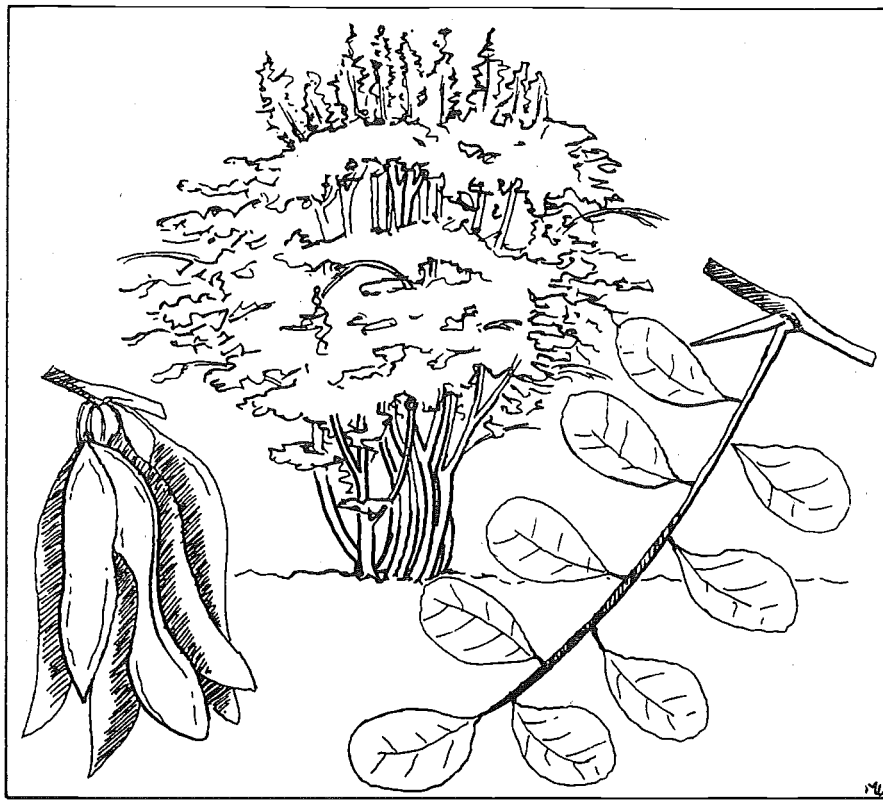
IMPORTANT USES

Use #1 : MEDICINE
The leaves, roots, and bark are used to treat stomach problems and pneumonia. It has a high oil content (30%) and high protein content (50%). The oil extract is reported to be a forceful purgative (ICRAF 1992).

Use #2 : LAND IMPROVEMENT
It makes a good live fence and the leaves are used for mulch and green manure.

Use #3 : FIREWOOD
It is highly regarded as firewood but is not recommended for charcoal as the smoke stings the eyes.

DALBERGIA MELANOXYLON*



DISTRIBUTION

Is widely distributed, and tolerates a wide range of sites, especially on gravelly soils. A deciduous savannah tree or shrub, it will intertwine with other trees, and has a heavily branched, many stemmed growth habit. It is found in tropical lowlands and on various sites in subhumid and semiarid areas.

In Tanzania it is found in low altitude savannah or woodlands around Morogoro and Itigi, down to the coast. Often it grows in areas where productive agriculture is impossible due to shallow, rocky soils. This is an indication of the tree's hardiness but may also indicate that it can not effectively compete when conditions are better (Forest Division 1984).

Status : *D. melanoxylon* is a national emblem protected by law (UNEP 1988).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1300
Minimum Rainfall (mm) :	600
Maximum Rainfall (mm) :	1000
Minimum Temperature (C) :	0
Maximum Temperature (C) :	20

REQUIREMENTS

Soil Requirements : Needs sufficiently moist soils, preferably near water (Von Maydell 1986).

Light Requirements : Light demanding.

Influential Factors : Does not regenerate well naturally (Von Maydell 1986). It is able to withstand fire and mature trees are damaged but not usually killed by bush fires.

PROPAGATION

Means of Propagation : Seed, wildlings, cuttings, root suckers, and coppice.

Seeds per kg :	42000
Germination Rate (%) :	30
Seed Sources : 1200 TSH per kg - Silviculture Research Centre 1991/92. 1000 TSH per Kg pods - Tanzania National Seed Centre 1991.	

Seed Treatments : Pods are long, flat, papery, and about 4 cm in length with 1 to 4 seeds per pod. The pods do not burst open on maturity. Pretreatment is not necessary. Seed germinates readily, but has a short viability period and should be planted within a few months after collection.

Seed Considerations : Raising from stumps may be better than from potted seedlings. Plant a 2 year old stump 14 cm long (12 cm root + 2 cm stem) in early or mid rains then weed intensively.

SILVICULTURE

Planting Types : Planted as individuals or mixed with fast growing trees which do not cast too much shade (Forest Division 1984).

Growth Factors : Growth is slow, especially in the first few years. Young trees coppice well, but coppicing ability declines with age (Forest Division 1984). It survives if subjected to competition for moisture and light, but height and root collar development will be negligible.

Growth Cycle : It takes between 70 and 100 years to reach maturity for harvesting (UNEP 1988). Well tended trees will grow 0.6 to 0.7 m in height per year and 1 to 1.5 cm in diameter per year. The tree is deciduous, losing its leaves briefly in the dry season (Forest Division 1984).

Management Systems : Planting early in the rainy season gives better results than later planting (Forest Division 1984). Water sparingly so the seed does not rot. Seedlings grow well if areas are well weeded.

Side pruning may be needed for a clean bole. It may make economic sense to do intensive weeding for the first 5 to 8 years, depending on market prices for *D. melanoxylon* (Mugasha 1983).

IMPORTANT USES

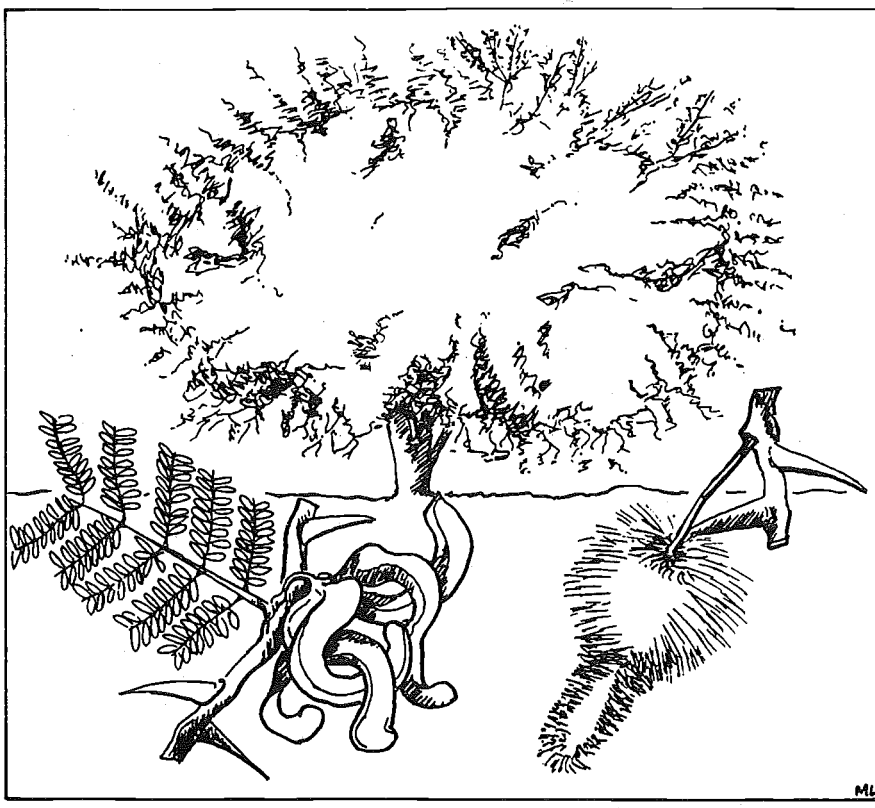
Use #1 : CRAFTS
Carvings from African ebony made by the Makonde tribe are well-known outside Tanzania. The heartwood is very suitable for traditional carvings and musical instruments which are for sale throughout the country. The trade offers revenue to those who live near otherwise unproductive sites.

The wood has considerable potential to earn foreign exchange from carvings and for use in Europe for musical instruments. It is used to make piano keys and clarinets (Teel 1984).

Use #2 : MEDICINE
The roots can be used to treat abdominal pain, hernia, gonorrhoea, and in abortion (Westman Draft). The bark from the root and the stem is an antidiarrhetic and the smoke of burning roots is inhaled to treat headaches and bronchitis. The juice from leaves can be used to treat sore throats, heart problems, dysentery, syphilis, and gonorrhoea. A decoction of the bark is used for cleaning wounds.

Use #3 : LAND IMPROVEMENT
The leaves make good mulch, are used as green manure, and for fodder. It is also thought to be nitrogen fixing.

DICHROSTACHYS CINEREA*



DISTRIBUTION

Grows in a variety of habitats: dry forests, woodlands, shrublands, open grassland, river banks, rocky hillsides, and coastal plains. Penetrates clear cut areas far into the rainforest zone. It is common in grasslands and on river banks in Arusha, Dodoma and Singida (RSCU 1992). It can form thickets on overgrezed sites (Dele and Greenway 1961).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000

REQUIREMENTS

Soil Requirements : Prefers heavy clay, loams, and sands and is reported to improve poor soils (Von Maydell 1986).

Light Requirements : Demanding.

Influential Factors : The tree is fire resistant. It is difficult to eradicate because of abundant root suckers. Pods are favoured by livestock and wild animals, and trees may need protection. It may colonize abandoned gardens and overgrazed fields.

PROPAGATION

Means of Propagation : Seedlings, direct sowing, and root suckers. It is easily established from root or stem cuttings.

Seeds per kg :	39000

Seed Treatments : Pods are dark brown, long, and twisted, each containing about 4 seeds. Pods may remain on the tree for several months before falling. Seeds are hard and should be scarified by mechanical or chemical means (Kew 1984).

Seedling Management : Seeds prolifically when in open land (RSCU 1992).

SILVICULTURE

Planting Types : Generally not planted near houses since it is very thorny.

Growth Factors : *D. cinerea* spreads quickly.

Management Systems : Root spreading should be controlled. It tolerates coppicing, lopping, and pollarding.

IMPORTANT USES

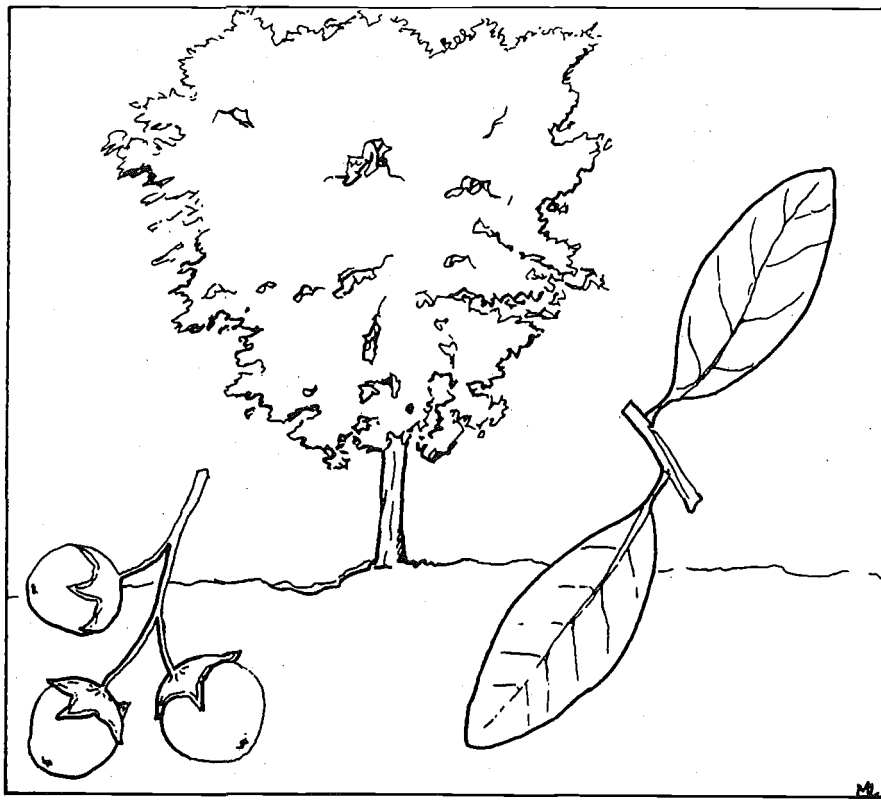
Use #1 : FUELWOOD
It is considered to be a valuable firewood and charcoal species, notably in Dodoma.

Use #2 : MEDICINE
The bark is used to treat dysentery, toothaches and elephantiasis. The leaves are a laxative and used to treat gonorrhoea and boils. It is also a remedy for stomach problems and can remove poison from snakebites. It is used as an aphrodisiac and as an astringent for scorpion bites (Rulangaranga 1989).

Use #3 : GENERAL PURPOSE WOOD
The wood is very heavy and hard, (fine dark brown heartwood), termite resistant, but usually of small dimensions. It is used in the construction of houses, for tool handles, and as support for local grapes. Branches are used for fencing and for cattle *bomas*.

OTHER USES : The pods are high in protein and are highly valued for goat fodder in Dodoma. The flowers are regarded as a good plant for honey bees. It is also nitrogen fixing.

DIOSPYROS MESPILIFORMIS*



DISTRIBUTION

A woodland and savannah tree, it is widespread at medium to low altitudes in Tanzania. It is more abundant along river banks and near swamps in Miombo woodlands than in wooded grasslands and lowland rainforests (FAO 1983). *D. mespiliformis* is found in Tabora, Morogoro, Dodoma, Mbeya, and Kilimanjaro.

Minimum Altitude (m) :	350
Maximum Altitude (m) :	1250
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1270
Minimum Temperature (C) :	16
Maximum Temperature (C) :	27

REQUIREMENTS

Soil Requirements : Prefers rocky soils, along seasonal watercourses and swamps. It grows well in red loams, volcanic and loamy sands, and termite mounds. The tree prefers moist soils (FAO 1983).

Influential Factors : Susceptible to weeds. It prefers areas with permanent water which

helps in natural regeneration.

Growth Factors : Slow growing.

Growth Cycle : Flowers in the rainy season and fruits ripen in the dry season. Fruits are edible in February and March.

PROPAGATION

Means of Propagation : Propagated naturally by seed, coppice, root suckers, and seedlings.

Seeds per kg :	3000

Seed Treatments : Seeds can be collected, pretreated and seedlings raised in the nursery. To break dormancy seeds should be soaked in boiling water (Von Maydell, 1986). Seed can be stored for very long periods.

Seedling Management : Germination is good, but it may be delayed by low soil moisture and seed dormancy. Seeds are attacked by seed borers. Natural regeneration is often not adequate and is likely hindered by seed dormancy and low soil moisture (FAO 1983).

SILVICULTURE

Management Systems : Partially clear planting areas and weed until trees are well-established (FAO 1983). Protection from fires could help improve crop stocking in natural forests.

IMPORTANT USES

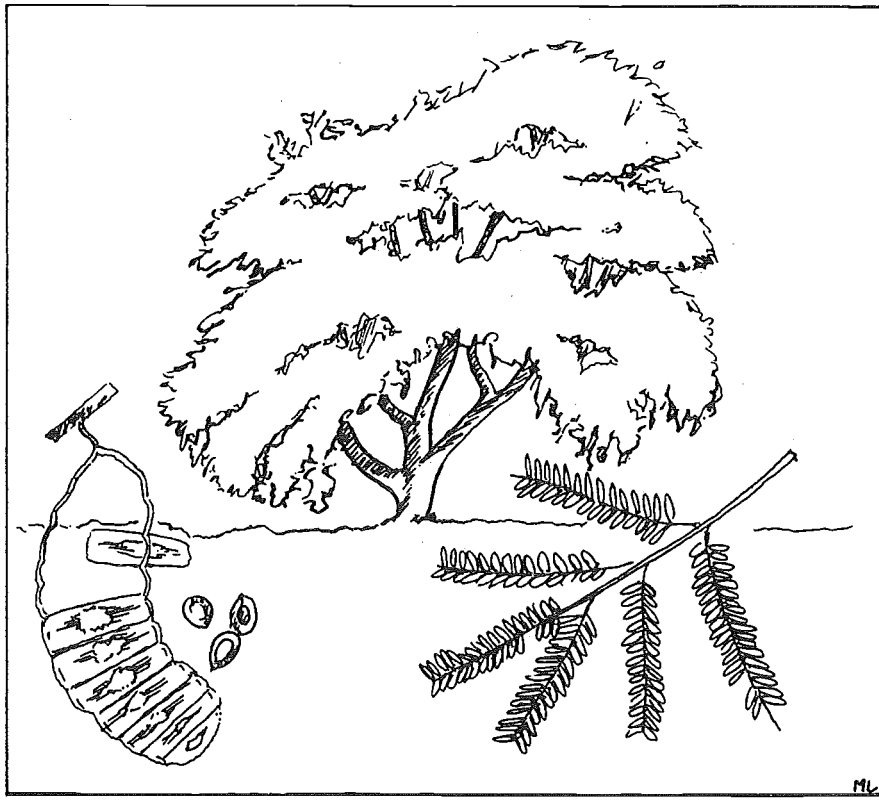
Use #1 : MEDICINE
The leaves are used to treat fever, as wound dressings, and as a poison antidote. The bark and roots are used for diseases such as malaria, syphilis, and leprosy. Different parts of the tree are also used to treat headaches, toothaches, and other body pains.

Use #2 : FRUIT
The fruit is edible and eaten either fresh or dried. The fruit is also used in making a brandy is stored and eaten in times of food shortages (FAO 1983).

Use #3 : TIMBER
Produces black heartwood 'ebony'. Only a few trees yield this black wood after felling, which is pale at first and then gradually becomes dark brown. The wood is hard, strong, fine-grained and is fungus and termite resistant (RSCU 1992). It is used in making tool handles, gun stocks, furniture, and carvings.

OTHER USES : It makes a very good firewood and charcoal as well as bee forage.

ENTADA ABYSSINICA*



DISTRIBUTION

Widely distributed savannah species found in woodlands and wooded grasslands. The tree prefers grassland and bush savannah conditions. *E. abyssinica* is found near Mwanza, in Tabora, Mbeya, Mtwara and Morogoro (Rulangaranga 1989).

Minimum Altitude (m) :	60
Maximum Altitude (m) :	2300
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1270

REQUIREMENTS

Soil Requirements : Tolerates a variety of soils ranging from loam to clay loams and sometimes friable clay over laterite (FAO 1986).

Light Requirements : Strongly demanding.

Influential Factors : Prefers open areas.

PROPAGATION

Means of Propagation : Seedlings and direct sowing. The tree is propagated naturally by root suckers, seed, and coppicing.

Seeds per kg :	3900
Germination Rate (%) :	85

Seed Treatments : Has characteristic large flat pods, 15 to 50 cm long. Each seed breaks away from the pod in an envelope on the inner skin of the pod, which acts as a wing, leaving the skeleton of the pod on the tree (Dale and Greenway 1961). To propagate, remove the seeds from the pods. Put the seeds in hot water and allow them to soak overnight. Plant in containers or pots. Pretreatment is sometimes necessary because of the hard seed coat.

Seedling Management : Seed germination rate is very high, between 70 and 90%.

SILVICULTURE

Planting Types : *E. abyssinica* has good potential for agroforestry as it does not compete with crops and may improve the soil.

Growth Factors : Fast growing on good sites.

Growth Cycle : Flowers in the rainy season. Fruits ripen towards the end of the rainy season and into the dry season.

Management Systems : Planting on a cleared site and slashing of vegetation may increase growth and yield (FAO 1986).

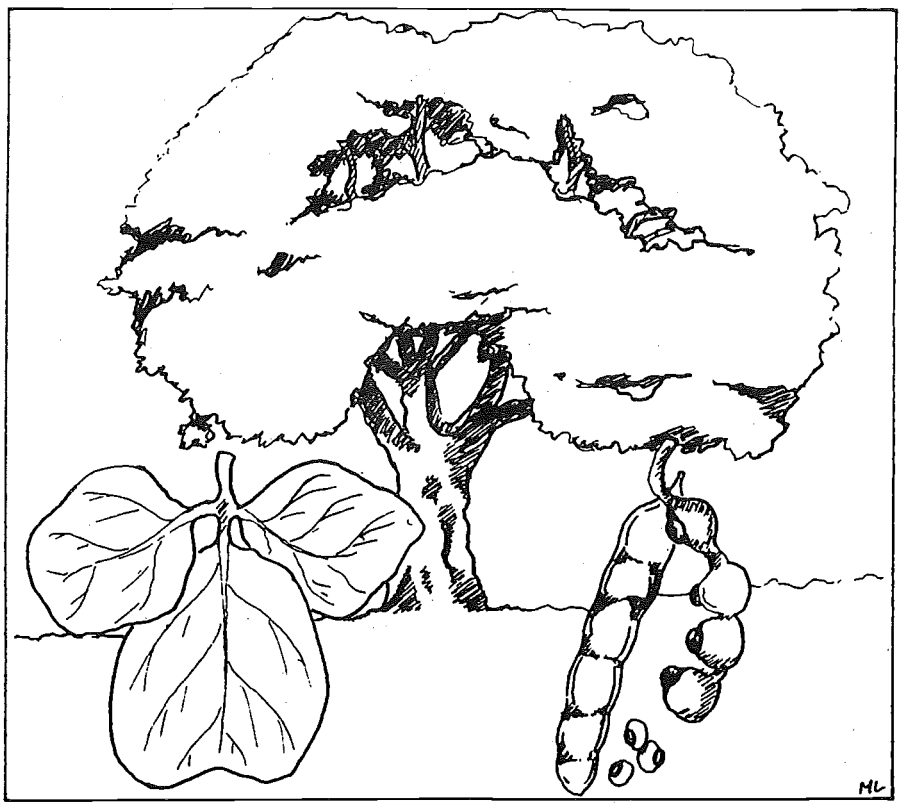
IMPORTANT USES

Use #1 : MEDICINE
Leaves are used to treat fever and the bark is used for colds, stomach pains, and bronchial problems.

Use #2 : LAND IMPROVEMENT
Farmers report that *E. abyssinica* improves the soil. It is thought to be nitrogen fixing. It is suitable for mulch and as a shade tree.

Use #3 : RITUAL
It is used in rainmaking and other ceremonies.

ERYTHRINA ABYSSINICA*



DISTRIBUTION

A deciduous savannah species suitable for a wide range of conditions. It is widespread in Tanzania in various habitats including open woodlands, forest clearings, grasslands, and lowland woodlands to 2000 m except in very dry or high altitude areas (RSCU 1992). *E. abyssinica* is found in Mbeya, Rukwa, Morogoro, Tabora, Arusha, the Coast and Kagera (Rulangaranga 1989).

Minimum Altitude (m) :	60
Maximum Altitude (m) :	2290
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1500
Minimum Temperature (C) :	15
Maximum Temperature (C) :	25

REQUIREMENTS

Soil requirements : Occurs on a variety of soils from loams to clay loams. The tree prefers deep well-drained soils on plateaus and slopes (Egli and Kalinganire 1988).

Light Requirements : Moderately light demanding.

Influential Factors : Fairly fire and termite resistant (RSCU 1992). *E. abyssinica* can be grown only on frost free sites.

PROPAGATION

Means of Propagation : Seedlings, cuttings, direct sowing, coppice, suckers and truncheons, or stems.

Seeds per kg.:	6800
Germination Rate (%) :	82
Seed Sources : 800 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Pods are 15 to 25 cm in length and should be collected as ripe fruits while still on the tree. Seeds are red with a black spot, and are contained in woody black pods. Seeds retain their viability for a long period, and may be stored indefinitely in cool, dry, insect free conditions. Seed does not require pretreatment. The seed of all *Erythrina* is poisonous.

Seedling Management : Low germination rates have been reported (RSCU 1992) but Egli reports a germination rate of 90% with fresh seeds (Egli and Kalinganire 1988). Direct sowing, seedlings and transplants have equal success. It has been noted that old trees coppice readily. Trees are easily propagated from large cuttings which is the most common method of reproduction (Teel 1984). Cuttings are stripped of leaves and planted directly at the beginning of the rainy season.

SILVICULTURE

Planting Types : Recommended for planting in higher areas as single shade trees, in rows, or to mark boundaries in cultivated areas. It can be planted near dwellings, by fields, swamps, roads, and watercourses. It is also recommended for live hedges.

Growth Factors : Moderately fast growing.

Management Systems : The tree is easily cultivated and tolerates pollarding and coppicing.

IMPORTANT USES

Use #1 : MEDICINE
The bark of young stems is used to treat trachoma. It is also roasted and applied to burns and swellings. Powdered root is used for syphilis, anthrax, and snakebites (Rulangaranga 1989).

Use #2 : GENERAL PURPOSE WOOD
The wood is light (495 kg per m^3), easy to work, but is not durable and is liable to attack by insects and fungi (Egli and Kalinganire 1988). It was reported that beehives, drums, crafts, toys, necklaces, and domestic items such as spoons are made from the wood.

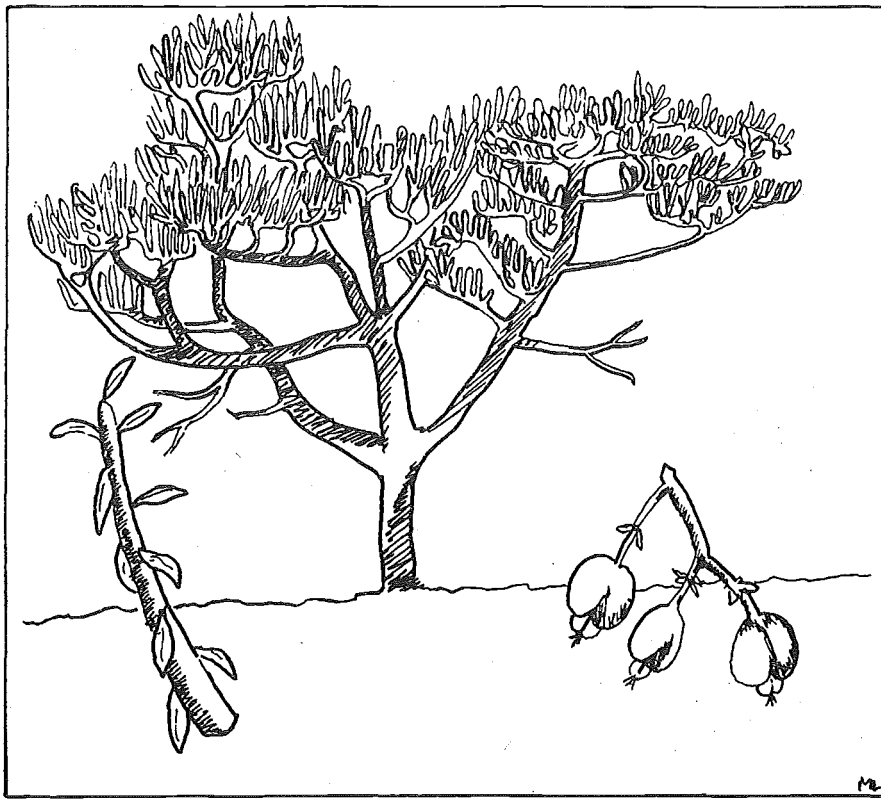
Use #3 : LAND IMPROVEMENT
It is widely recognized as an ornamental and shade tree. It is nitrogen fixing, its leaves are used for mulch, and it is known for conserving soil.

OTHER USES : Honey bees are also attracted by the flowers.

NOTES

It is protected by farmers and left standing when land is cleared for agriculture, indicating that it is highly valued.

EUPHORBIA TIRUCALLI



DISTRIBUTION

Succulent shrub common in the livestock rearing areas of Arusha, Dodoma, Mwanza, and Singida where it is planted as a *boma* and live fence (RSCU 1992). *E. tirucalli* is widely distributed, and adaptable to a range of sites, including marginal, drought prone zones.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1500
Minimum Rainfall (mm) :	250
Maximum Rainfall (mm) :	1000
Rain Months :	4
Minimum Temperature (C) :	9
Maximum Temperature (C) :	37

REQUIREMENTS

Soil Requirements : Prefers a wide variety of light-textured, neutral to acidic soils. Requires good drainage with available water table (Webb 1984).

Light Requirements : Demanding.

Influential Factors : Drought hardy and frost tender. The tree is not resistant to fire but is fairly safe from grazing animals. *E. tirucalli* does not compete with crops.

PROPAGATION

Means of Propagation : Cuttings and seed.

Seedling Management : Live fences can be established from cuttings. Cut fresh branches from a healthy bush. Take care to avoid direct contact with the milky sap, which can cause skin irritation. Plant at the onset of the rainy season in shallow trenches about 20 cm deep where water can collect. It can also be propagated easily from seed.

SILVICULTURE

Planting Types : Planted as a low, live *boma* hedge and windbreak in dry areas and livestock rearing areas. It is used mainly along boundaries, enclosing dwellings, fields and swamps, along tracks, roads, and waterways.

Growth Factors : Medium to fast growing.

Limitations to Planting : *E. tirucalli* is unpleasant to handle. The latex is very poisonous and dangerous to the eyes (human milk is a remedy). It harbours rodents.

Management Systems : Trim and top prune to make a hedge.

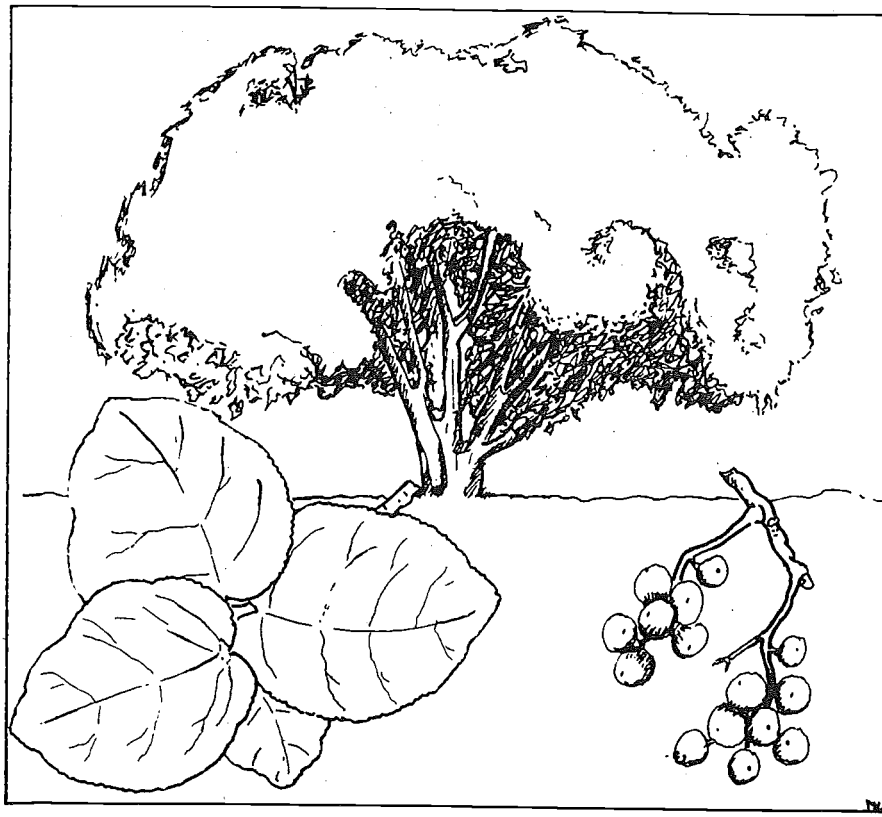
IMPORTANT USES

Use #1 : LIVE FENCES
It is widely used both in towns and in rural areas for hedges, fences, windbreaks, and to stabilize structures for soil conservation. It is commonly used in Dodoma region for these purposes.

Use #2 : MEDICINE
The roots are boiled and the juice is consumed for sterility problems in women and to treat snakebites. It is also used to treat sore throats and stomach ailments. The latex is very irritating to the skin and can cause temporary blindness. Several deaths have been attributed to the use of *E. tirucalli* for medicinal purposes (Westman Draft).

Use #3 : POISON
In Tanzania the plant is well-known as a fish poison and insect repellant for ants and mosquitos. The latex is an effective arrow poison as it causes irritation at the wound which enhances absorption of the poison and acts as a cohesive (Westman Draft). Its toxicity is thought to deter intruders when it is planted as a hedge around the home.

FICUS SYCOMORUS*



DISTRIBUTION

The tree prefers sites associated with a high water table, swamps, or along rivers and streams, but it is also suited to savannahs. It is left standing when riverine forests are cut down (RSCU 1992).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000

REQUIREMENTS

Soil Requirements : Prefers rich, well-drained, sandy soils with a shallow water table (Von Maydell 1986).

Influential Factors : Sensitive to frost. When cultivated in a home garden it requires considerable space as it is large, spreading, and very shady.

PROPAGATION

Means of Propagation : Cuttings.

SILVICULTURE

Planting Types : Frequently found on village boundaries and at market places. It is intercropped and in Kilimanjaro and Arusha bananas are grown underneath.

Growth Factors : Fairly fast growing.

Management Systems : Tolerates pruning and lopping.

IMPORTANT USES

Use #1 : FODDER
Fruits are eaten by livestock, wild animals, and birds. The leaves are fairly high in nutritive value with about 9% crude protein dry matter (Von Maydell 1986).

Use #2 : LAND IMPROVEMENT
F. sycomorus is often cited by farmers as an important tree for soil and water conservation and land improvement. It is used as a shade tree, for dune fixation, soil improvement, as a mulch, and for water retention.

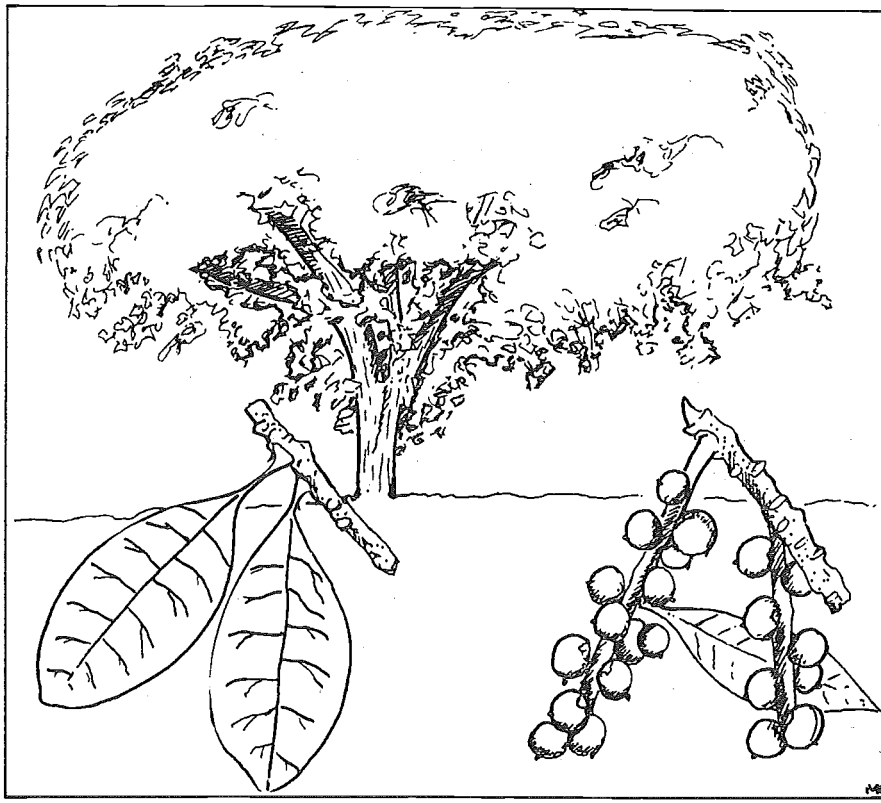
Use #3 : MEDICINE
The leaves are used to treat snakebites and jaundice. The latex is said to be effective for chest diseases, colds, and dysentery. In the literature numerous other medicinal applications are mentioned including bark remedies to treat coughs, throat infections and chest pains (Von Maydell 1986).

OTHER USES : *Ficus* species are widely valued for spiritual and sacred properties and as a focal point for resolving conflicts.

Fruits are round, from 2.5 to 5 cm in diameter, with a conspicuous opening with many bracts at one end, and of various colours. The fruits can be dried and have a high food value (RSCU 1992). Two or more crops of figs may be produced in a year.

The wood is light, pale, easy to work, but not very durable.

FICUS THONNINGII



DISTRIBUTION

Widely distributed in upland forest, open grassland, riverine, and rocky areas. It is also found in savannahs.

Minimum Altitude (m) :	1000
Maximum Altitude (m) :	2500
Minimum Rainfall (mm) :	800

REQUIREMENTS

Soil Requirements : Occurs on a wide variety of soils, but prefers light, deep, and well-drained soils with neutral reaction to acid (Egli and Kalinganire 1988).

Influential Factors : Needs to be protected from browsing animals when young. *F. thonningii* is not planted near buildings as the roots may crack foundations (RSCU 1992).

PROPAGATION

Means of Propagation : Propagated by cuttings and seeds dispersed by birds and animals.

Seedling Management : It is more effective to use cuttings rather than to raise plants from seed. Propagate by cuttings 20 to 50 cm at the start of the rainy season. Rerooting is good although sometimes slow. In Uganda the tree is propagated by stakes (Dale and Greenway 1961).

SILVICULTURE

Planting Types : Usually left standing in cropland and along property boundaries and roads. It can be planted as a shade tree (Sommerlatte 1990).

Growth Factors : Fast growing.

Growth Cycle : Fruiting trees sometimes shed their leaves.

Management Systems : Tolerates lopping and pollarding.

IMPORTANT USES

Use #1 : LAND IMPROVEMENT
It is planted as a live fence with the intention of using the leaves as mulch or green manure, for producing shade or for fodder. It is also highly regarded for its ability to store water and conserve soil.

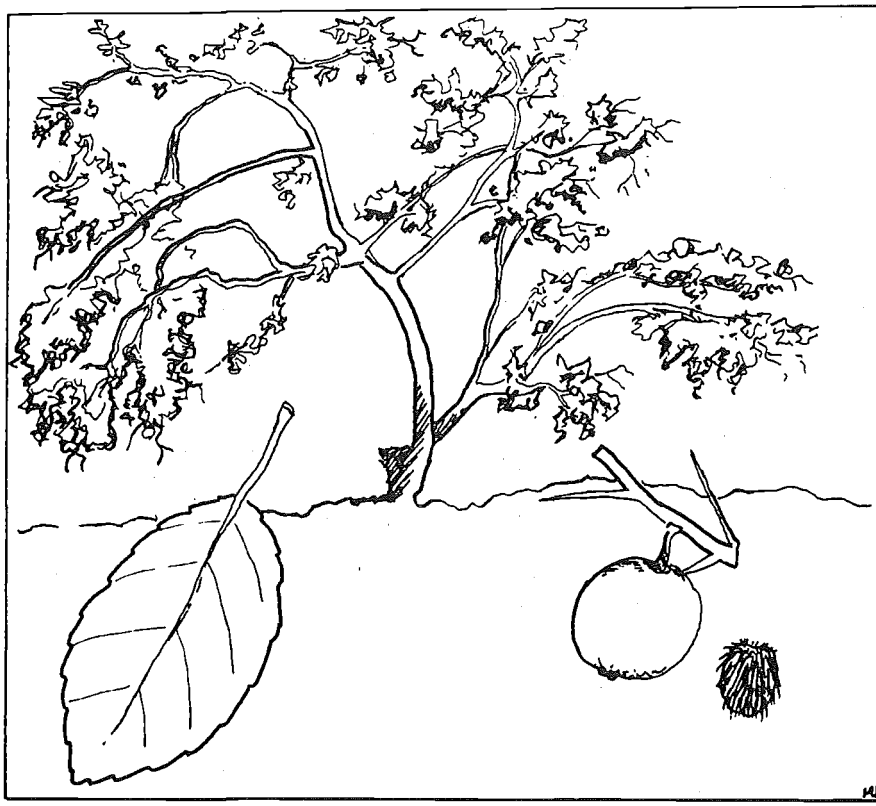
Use #2 : MEDICINE
The bark is quite important in local medicine as it can be used to treat colds, sore throats, diarrhoea, wounds, and to stimulate lactation.

Use #3 : FIBRE
Bark cloth is obtained by cutting out a strip or cylinder of bark which causes the tree to produce a fine matted covering of red, slender roots over the wound. This covering is used as bark cloth.

OTHER USES : The tree is used for ceremonial and sacred purposes.

The wood is light (495 kg per m^3), easy to work, but not durable.

FLACOURTIA INDICA



DISTRIBUTION

Found in a variety of climates and soils. Grows naturally in *Brachystegia* and *Combretum* woodland, wooded grassland, and bushland. It is found throughout Tanzania in coastal and inland areas, but it is never common (FAO 1983). *F. indica* is found in Iringa, Morogoro, Tabora, Kilimanjaro, Tanga, Dodoma, and the Coast.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1600
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1300
Minimum Temperature (C) :	13
Maximum Temperature (C) :	29

REQUIREMENTS

Soil Requirements : Tolerates a variety of well-drained soils. It prefers mostly sandy soils near watercourses and red clay soils (FAO 1983).

Light Requirements : Strongly demanding.

Influential Factors : Prefers a high water table and a lot of sunlight (RSCU 1992). Young plants need to be protected against fire (FAO 1983).

PROPAGATION

Means of Propagation : Coppice and from seed (natural and artificial regeneration).

Seed Treatments : Fruit is a small, red, fleshy, round berry. It turns a dark reddish-black when mature, and contains 4 to 10 brown, flattened, wrinkled seeds (Palmer and Pitman 1972). Cracking or scarifying the hard seed coat may improve germination.

Seedling Management : Can be propagated from seed but little is known about germination techniques.

SILVICULTURE

Planting Types : Grown in fields and near home compounds.

Growth Factors : Moderate growth.

Growth Cycle : Flowering and fruiting occur at various times depending on the locality. Fruit ripening occurs between December and July (FAO 1983). It takes about 5 to 8 months from flower fertilization to fruit ripening.

Limitations to Planting : The hard seed coat may restrict natural regeneration and result in slow germination.

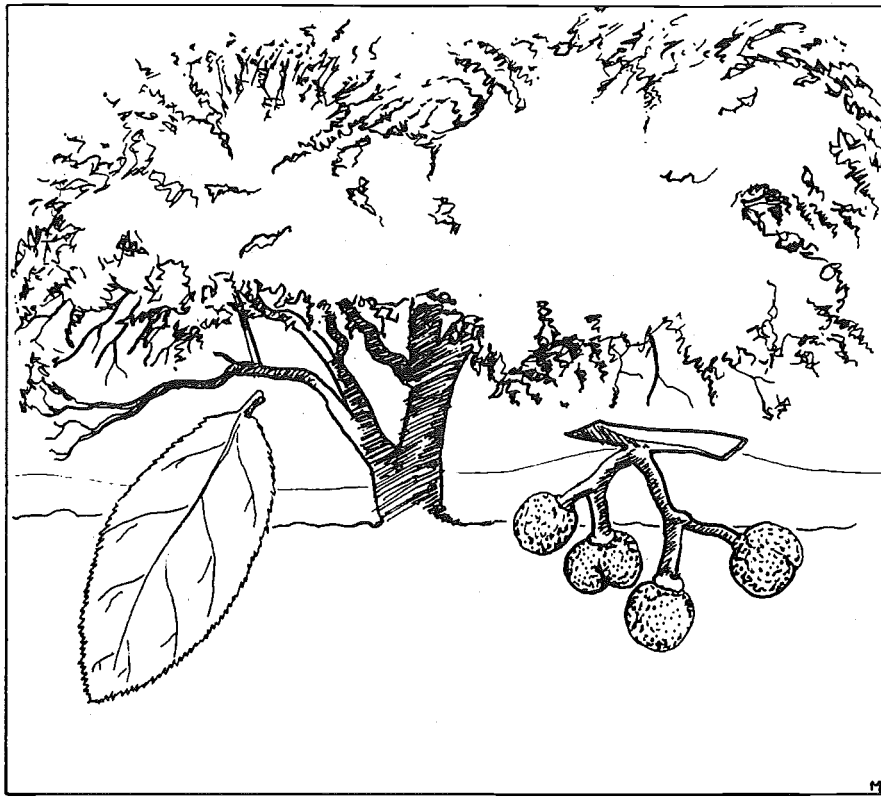
Management Systems : Partially clear site of vegetation since it is a light demander. Slash and spot weed the young crop (FAO 1983). Protection from fire is needed.

IMPORTANT USES

Use #1 : FRUIT
The flavour of the fruit tends to vary and while some varieties are sweet enough to be eaten raw, others are eaten only after cooking. Fruits are sold in the market and there is a high potential for processing into jams.

Use #2 : MEDICINE
The tree has many uses in local medicine. The fruits are used for jaundice and enlarged spleens. The leaves and roots are taken for schistosomiasis, malaria, and diarrhoea. The roots are used for hoarseness, pneumonia, intestinal worms and as an astringent, diuretic, and pain reliever.

GREWIA BICOLOR*



DISTRIBUTION

A widely distributed species in dry savannahs in east and southern Africa. In Tanzania it ranges from the coast to the highlands, along river courses and more abundantly in Babati and Singida districts (RSCU 1992). It is found on stony, rocky slopes, on steep river banks, low lying depressions, and flats in dry deciduous woodlands.

Minimum Rainfall (mm) :	400
Maximum Rainfall (mm) :	900

REQUIREMENTS

Soil Requirements : Prefers shallow sands (FAO 1988) and calcareous soils, rich sands along river banks, stony slopes, and sandy coastal areas (Von Maydell 1986). *G. bicolor* is sometimes found on clay or skeletal soils.

Influential Factors : Very drought resistant (FAO 1988).

PROPAGATION

Means of Propagation : Seed and cuttings.

Seeds per kg :	15000
Seed Sources : Institut Sénégalais de Recherches Agricoles, Centre National de Recherches, Parc Forestier de Hann, BP 2312, Dakar, Sénégal.	

Seedling Management : Small round edible fruits are about 5 mm in diameter, turning purple or black when ripe. Highest survival rates are likely with heel cuttings (FAO 1988).

SILVICULTURE

Planting Types : Planted in fields, along boundaries and possibly in small stands. It is reported to have potential for planting in Iringa.

Growth Factors : Slow growing but fruits abundantly.

Growth Cycle : Flowering and fruiting occur in the rainy season. Leaves fall during the dry season.

Limitations to Planting : Lack of silvicultural and marketing information.

Management Systems : Tolerates pruning.

IMPORTANT USES

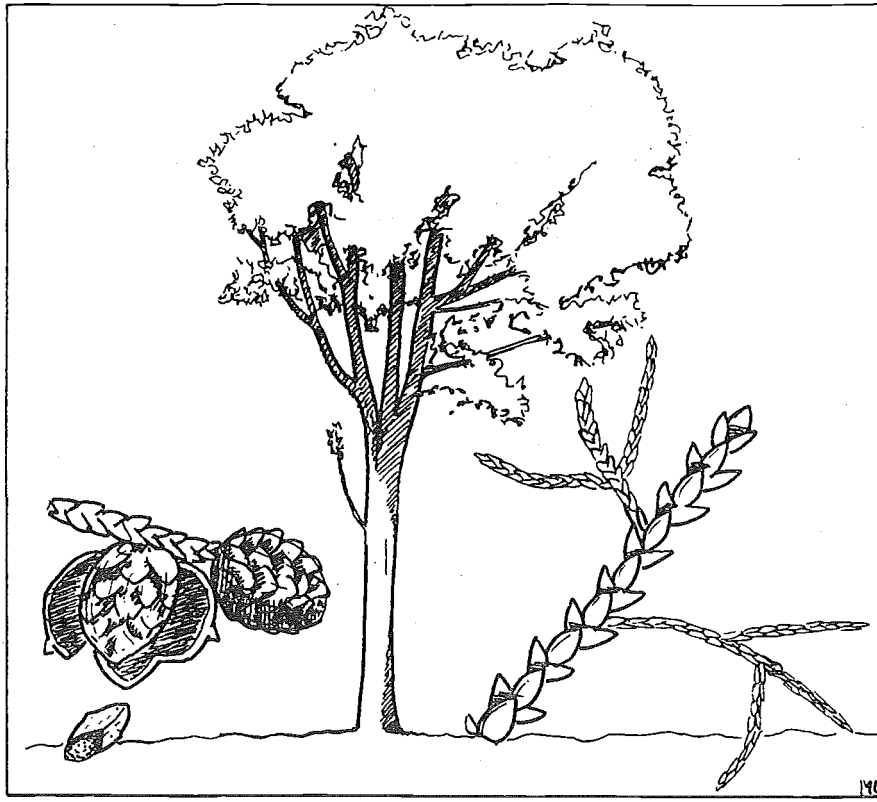
Use #1 : FRUIT
Fruit is eaten fresh or sun dried and is well-liked by people in Dodoma and Arusha regions. The fruit also makes a good forage. In other parts of Africa a juice and an alcoholic drink are made from the fruit (FAO 1988).

Use #2 : MEDICINE
A decoction of the root or bark is used for diarrhoea. The roots have also been reported to be given to treat gonorrhoea and female fertility and the bark for boils, sores, inflammation of the intestines, syphilis, and as a diuretic and laxative.

Use #3 : GENERAL PURPOSE WOOD
The wood is hard and durable and used for building materials and domestic uses such as spoons, walking sticks, clubs, arrows, bows, and tool handles. The wood is used by the Waarusha and Masai for clubs and spears. It is also a respected firewood.

OTHER USES : Twigs are used by water diviners to locate underground water (RSCU 1992).

JUNIPERUS PROCERA*



DISTRIBUTION

A dominant coniferous tree in drier high altitude forests, it prefers sites between the altitudes of 1200 and 3200 m. Young trees are often found at the forest edge. It is common in West Usambaras, on the Livingstone Mountains in northern Tanzania, on the northern slopes of Mt. Kilimanjaro and on isolated mountains of Masailand (RSCU 1992).

Status : Outlying populations are endangered. In Zimbabwe only 1 tree is known in the wild (Palgrave 1988).

Minimum Altitude (m) :	1500
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	400
Maximum Rainfall (mm) :	1200
Minimum Temperature (C) :	7

REQUIREMENTS

Soil Requirements : Seems to prefer well-drained soils no heavier than sandy clay.

Light Requirements : Demanding.

Influential Factors : Resistant to fungal decay and termites. Older trees are susceptible to heart rot fungus, *Fomes juniperius* (Dale and Greenway 1961).

PROPAGATION

Means of Propagation : Seed and wildlings.

Seeds per kg :	35000-47000
Germination Rate (%) :	50
Seed Sources : 2000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Small cones are berry or drupe-like when ripe, and waxy blue-green. They are the size of a small pea, each containing 2 to 3 seeds (Dale and Greenway 1961). Collect and dry ripened fruits in the sun and extract seeds in a mortar.

Pretreatment of seeds is not necessary. They can be sown directly in seed beds or containers. Seed viability is not a problem if seed is less than a year old and has been kept in a cool dry place (Teel 1984).

Seedling Management : Seed is readily available but has short viability, 6 to 12 months. Due to the hard seed coat, hot water or acid pretreatment is recommended.

Immerse in hot water at 100 degrees C for 1 minute or soak in acid for 10 minutes. Use of hot water is recommended in areas where sulphuric acid is not easily available. Increases in germination rates from 68 to 78% have been measured 14 days after sowing with treatment (Laurent and Chamshana 1987).

SILVICULTURE

Planting Types : Can be grown in plantations. However slow growth in Shume (Lushoto) has discouraged planting (RSCU 1992). It should not be grown on cropland as leaf fall is too acidic (Teel 1984). It is preferable to grow around *shambas*.

Growth Factors : Fairly fast growing in open stands, but slow elsewhere.

Growth Cycle : Seeds are available in January through April, probably every year (Borota 1975).

Limitations to Planting : Wildfires, browsing pressure, and demand for fast growing exotics are constraints to promoting this species on a larger scale.

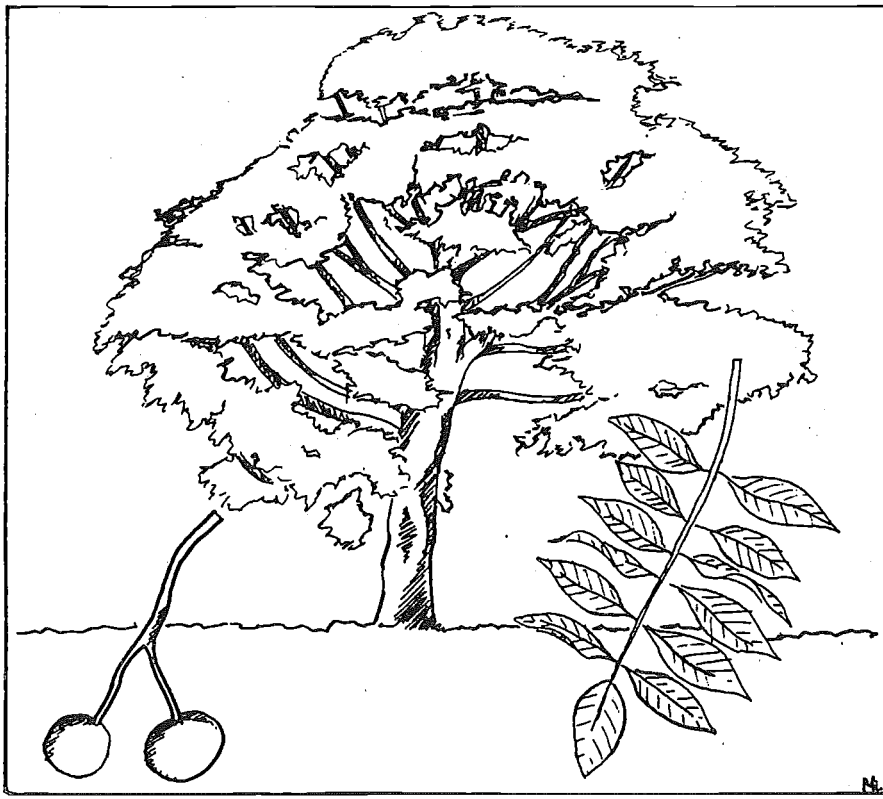
Management Systems : Seedlings take 1 to 2 years in the nursery. Close initial spacing of 2x2 m is recommended to limit low crown development. In Tanzania early prunings take place at years 2.5 and 6. The first thinning is in year 5, where 50% is removed.

Weedings have to be carried out at least once a year during the establishment phase. Prune and thin trees for timber and poles.

IMPORTANT USES

Use #1 : GENERAL PURPOSE WOOD
The wood is of medium hardness, is very resistant to termites, and durable against rotting. It is apt to split when nailed (Dale and Greenway 1961). Main uses include house construction, fence posts, shingles, transmission and other poles, flooring, and wooden structures exposed to the weather where durability is required, for example beehives, and pencils.

KHAYA ANTHOTHECA



DISTRIBUTION

Occurs at medium to low altitudes in evergreen forests and riverine fringe forests. In Tanzania it is commonly found in the foothills of mountain ranges, in well-drained soils, and swamp and riverine areas. It has been successfully grown in South Africa, Cuba, and Puerto Rico (Francis ND).

Minimum Rainfall (mm) :	600
Maximum Rainfall (mm) :	1600

REQUIREMENTS

Soil Requirements : Prefers moist, well-drained soils with subsoil moisture (Watkins 1960). *K. anthotheca* is found on fertile alluvial soils, stable, gently sloping riverbanks, and adjacent alluvial slopes.

Light Requirements : Moderately shade tolerant when young and moderately intolerant when older (Francis ND).

Influential Factors : Normally resistant to termites. Young trees are prone to damage from the shoot borer *Tragocephala variegata* (Watkins 1960). It is very sensitive to fire and frost. Browsing animals can destroy young plants or slow growth.

PROPAGATION

Means of Propagation : Seed, seedlings, stumps (24 months), transplants (9 to 12 months).

Seeds per kg :	3000
Germination Length :	3-4 weeks
Seed Sources : 1500 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : It is reported that it is not possible to dry and store *K. anthotheca* seed, due to short seed viability. Storing seed for longer than 3 months is not recommended (RSCU 1992). Pretreatment of the seed is not necessary.

Seedling Management : The tree regenerates well by seed under a densely shaded canopy. When seedlings are grown in small containers they should be outplanted when they reach 30 cm and have fully developed compound leaves (Francis ND).

Nursery stock can be left to develop to a stripling or a bare-rooted stock with a long shoot (1 to 2 m). The root system is only slightly pruned off. Seedlings are stripped of leaves before being transported to the planting site to reduce transpiration losses (Nwoboshi 1982).

SILVICULTURE

Planting Types : Used in intercropping.

Growth Factors : Fast growing.

Growth Cycle : A typical rotation is from 60 to 80 years. The tree fruits from March to July and sometimes later (Palgrave 1988). *K. anthotheca* is reported to be insect pollinated (Francis ND).

Management Systems : Light shade is recommended, possibly in a mixture with *Melicia excelsa* (Watkins 1960). Reported spacings are 5x5 m in South Africa and 2.4x2.4 m in Puerto Rico (Francis ND). *K. anthotheca* coppices poorly but it will coppice if it is not too old when it is cut. It is sensitive to competition from weeds and grass. Hoeing and cleaning are necessary.

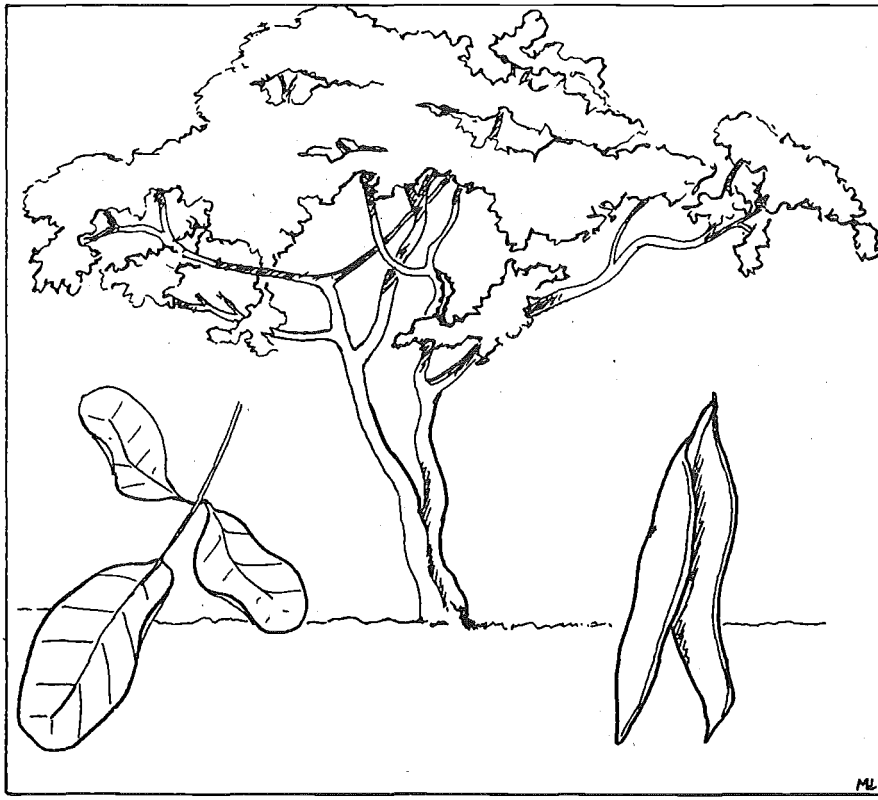
IMPORTANT USES

Use #1 : TIMBER
The wood weathers well and resists borers and termites. It is moderately resistant to fungal decay. The timber saws well but is inclined to be tough so sharp equipment is needed. It is a popular wood for furniture, flooring, panelling, and boat building. *K. anthotheca* is heavily used in Ruvuma region for furniture. Large quantities of this species have been exported from East Africa.

Use #2 : MEDICINE
The bark is bitter, similar to quinine, and is used for colds. Oil from the seed is rubbed into the scalp to kill insects.

Use #3 : LAND IMPROVEMENT
It is used as a shade tree and as a windbreak.

LONCHOCARPUS CAPASSA*



DISTRIBUTION

Usually grows near water at low to medium altitudes but not in evergreen forests (RSCU 1992). It is found in Miombo woodlands including Morogoro, Dodoma, Mikumi National Park, Selous Game Reserve, and Ruaha National Park (Rulangaranga 1989).

Status : The tree is protected in South Africa (Palgrave 1988).

REQUIREMENTS

Soil Requirements : *L. capassa* prefers well-drained soils.

Influential Factors : Very sensitive to fire (RSCU 1992). It is tolerant to a few degrees of frost.

PROPAGATION

Means of Propagation : Seed.

Seed Treatments : Pretreatment not necessary. Use fresh seed. Pods are flat and greyish, about 12x2.5 cm, with a wing along one edge, and contain 1 to 5 seeds.

Seedling Management : The tree is easily raised from seed.

SILVICULTURE

Planting Types : Readily cultivated in gardens. It is used for reforestation in Dodoma.

Growth Factors : Fairly fast growing.

Growth Cycle : Fruits are produced from May through October (Palmer and Pitman 1972). The kidney shaped seeds are set free when pods rot on the ground.

Management Systems : Young trees must be protected against fire and browsing.

IMPORTANT USES

Use #1 : BEE PLANT
The flowers are very fragrant and the abundant nectar readily attracts bees.

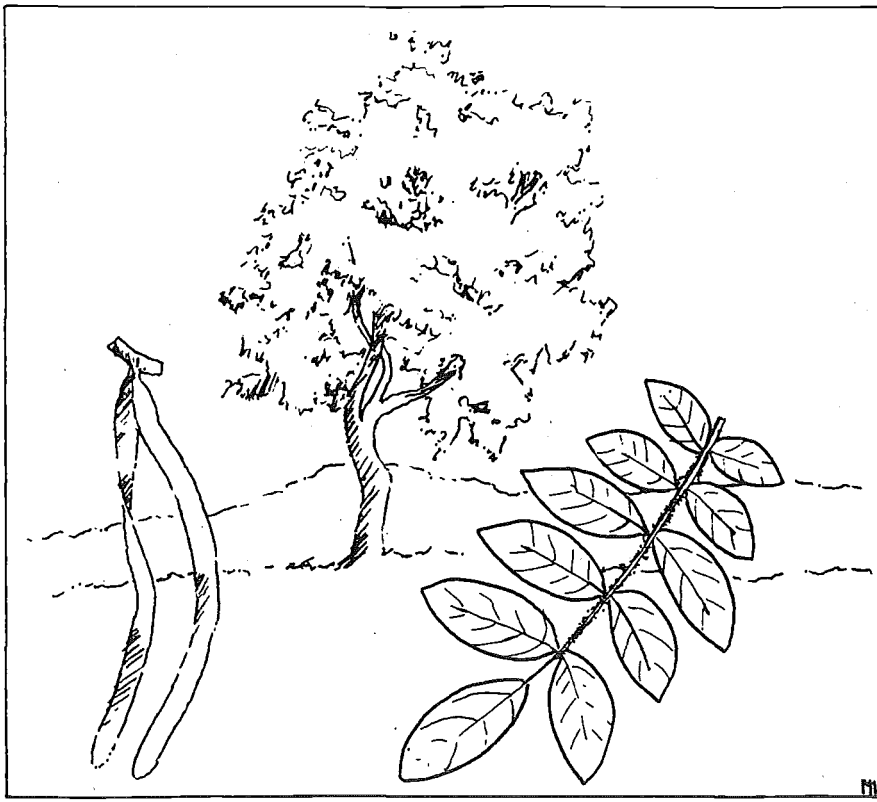
Use #2 : MEDICINE
The roots are used to treat stomach disorders, hookworms, and coughs. Rotenone, used in the insecticide Derris, is extracted from the roots (RSCU 1992).

Use #3 : GENERAL PURPOSE WOOD
The wood is strong, fairly hard and heavy, and is used for making grain mortars and tool handles.

NOTES

Many Africans are superstitious about *L. capassa* as it is one of the rain trees. In Tanzania the leaves are put into the luggage of travellers for protection during a journey. The tree is also known to be a reliable indicator of ground water.

MARKHAMIA OBTUSIFOLIA*



DISTRIBUTION

A shrubby tree growing in lowlands and highlands, from open woodland to dune scrub (RSCU 1992).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1300

REQUIREMENTS

Soil Requirements : Prefers well-drained soils, but is found on a variety of types.

PROPAGATION

Means of Propagation : Can be propagated from seed, wildlings, or cuttings.

Seeds per kg :	70000

Seed Treatments : Not recommended. Produces slim long pods up to 60x3 cm in size. Pods are yellow-brown and velvety (Dale and Greenway 1961). Use and store fresh seeds.

SILVICULTURE

Planting Types : Has good potential for agroforestry in the highlands and Miombo woodlands. It can be grown with crops on farmland, and inside and along farm boundaries.

Growth Factors : Fairly fast growing.

Growth Cycle : Produces fruit from January to September (Palgrave 1988).

Management Systems : *M. obtusifolia* coppices readily.

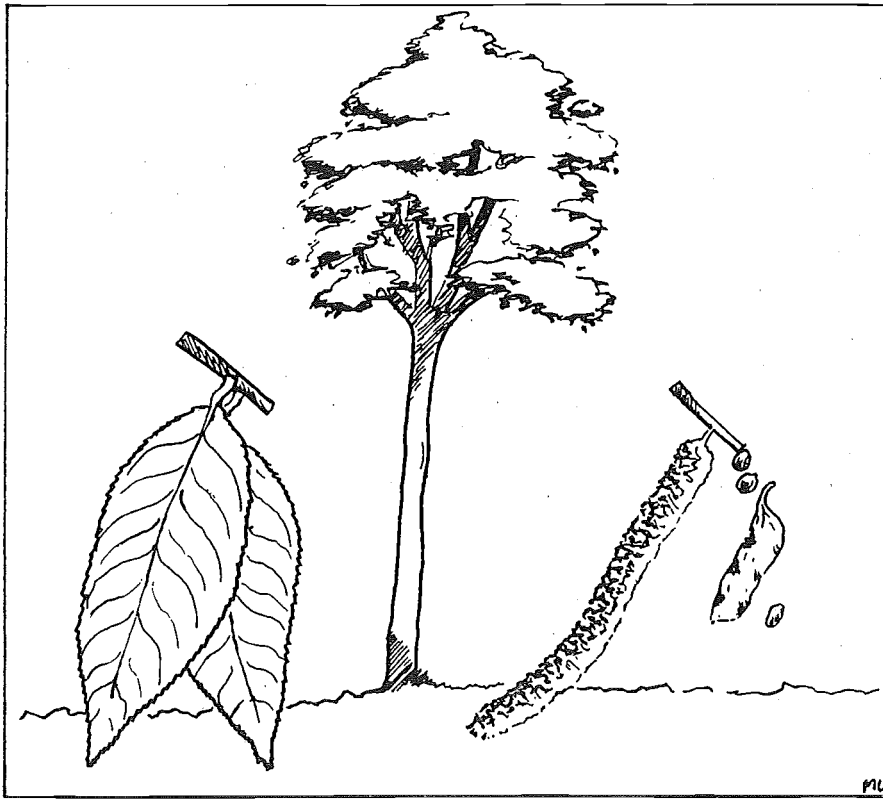
IMPORTANT USES

Use #1 : MEDICINE
The root is boiled and used to treat backaches, body pains, and to relieve stomach gas. Uses that have been cited in the literature include: treatment for scrofula, hookworm, and snakebites with root powder; chewing roots to treat convulsions in children; and boiled roots, bark and leaves used as an inhalant (Westman Draft). The leaves are also used to tell fortunes.

Use #2 : GENERAL PURPOSE WOOD
The wood is whitish, heavy, and durable. It is used for furniture, poles, in the construction of local houses, and tool handles.

Use #3 : FODDER
Both leaves and fruit are eaten by goats.

MILICIA EXCELSA*



DISTRIBUTION

A large deciduous forest tree of lowland forest and wet savannah. It is widespread throughout tropical Africa and is very common in many of the wetter lowlands of Tanzania. It is a forest pioneer species and survives in the mature forest as a canopy tree (Sommerlatte 1990). It is found as a scattered tree in foothills of the coastal mountains, and in areas around Lake Malawi and Lake Victoria, below 1000 m (RSCU 1992), including the Coast, Tanga, Morogoro, Dodoma, Iringa, Tabora, Ruvuma, and Kigoma. It can grow with about 700 mm annual rainfall if it has access to a supplementary source of water.

Status : *M. excelsa* is a reserved tree in Tanzania. It is endangered in parts of its range due to extensive cutting.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1200
Minimum Rainfall (mm) :	1000
Maximum Rainfall (mm) :	2000
Minimum Temperature (C) :	20
Maximum Temperature (C) :	35

REQUIREMENTS

Soil Requirements : Tolerates a wide range of freely drained soils (Forest Division 1984). It prefers deep, fertile, and moist loams (Borota 1975); freely drained light red loams; or freely

drained, sandy soils of neutral to alkaline reaction. It can tolerate fairly high salinity.

Light Requirements : Strongly demanding.

Influential Factors : Does not tolerate waterlogging, and is susceptible to attacks by a gall insect.

PROPAGATION

Means of Propagation : Can be propagated from stumps, seed, coppice, and root suckers.

Seeds per kg :	350000
Germination Rate (%) :	80
Germination Length :	14-18 days
Seed Sources : 200 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Fruits are collected from the ground in January and seeds should be extracted immediately by soaking in water (Borota 1975). Soak fully ripe fruit for 4 days to remove pulp, then dry and sow seed. Longer soaking reduces seed viability. Since seed loses viability quickly, it should be stored in dry, cold, air tight conditions. After 1 year there is only 50% germination rate. Seed is best if used within 3 months.

Pretreatment is not necessary (RSCU 1992).

Seedling Management : Coppices and regenerates well. It is not a prolific seeder. Germination is usually quick and good. Attention must be given to seedlings against gall attack. Stumps (27 cm root length, 2 cm diameter) or striplings (2.4 m tall) are generally transplanted in the field (Forest Division 1984).

SILVICULTURE

Planting Types : Not suitable for close planting due to the incidence of leaf gall insect attack. Mixed or single tree planting is preferable.

Growth Factors : Relatively fast growing.

Growth Cycle : Rotation is 60 to 80 years.

Limitations to Planting : The need for special planting arrangements and management requires some technical advice.

Management Systems : Seedlings can be planted after 12 to 18 months in the nursery. *M. excelsa* generally requires special planting arrangements with wide spacing in order to reduce the incidence of gall attack (Forest Division 1984). Seedlings under shade in the forest are fairly free from gall as is a plant with a height of 4 m or more. A nurse tree is generally required, such as a fast growing tree like *Trema orientalis* or an agriculture crop like banana. The nurse crop should be spaced at about 2.7x2.7 m and *M. excelsa* at 9x9 m in groups of up to 4 stumps, 60 cm apart (Forest Division 1984). Vegetation should be removed around the stumps and the area weeded for 2 to 5 years. Thinning should be done over years 4 to 8, retaining the best trees in each group.

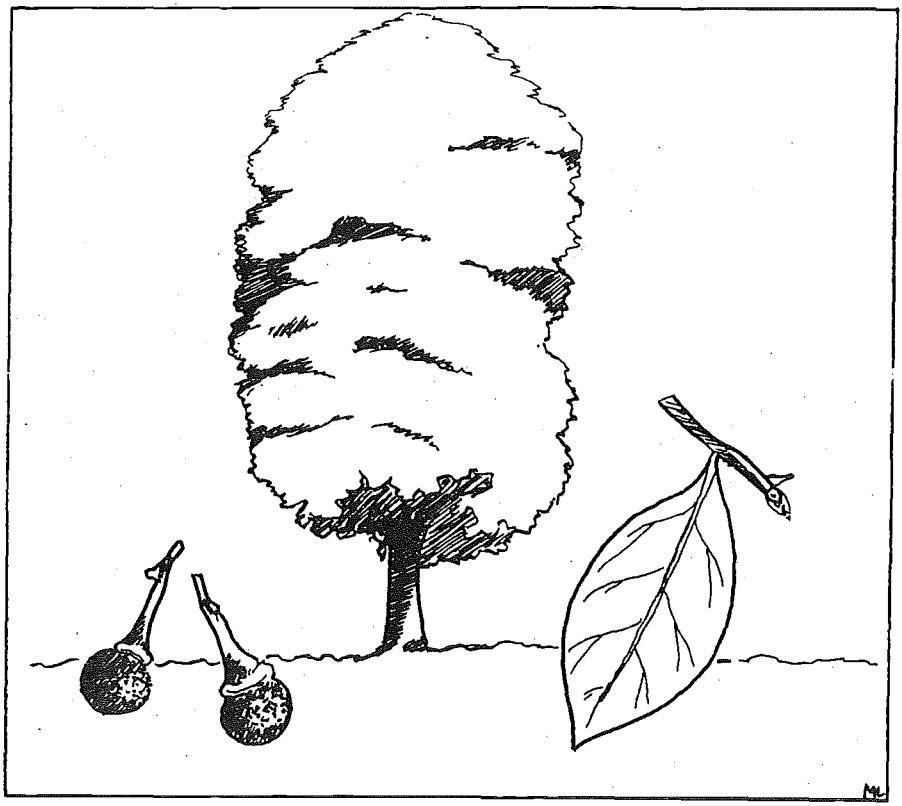
IMPORTANT USES

Use #1 : TIMBER
The high quality timber is often used as a teak substitute. It is of significant commercial value and commands high prices internationally. Locally it is used for furniture, boat building, and general purpose building timber. It resists termites well.

Use #2 : MEDICINE
The bark, its ashes, the leaves, and the latex are all used in local medicine. The latex is used to reduce tumours and obstructions of the throat and for stomach problems. The bark is used to treat coughs, dysentery, heart problems, and general tiredness.

Use #3 : LAND IMPROVEMENT
It is often used as a shade tree and along streets as an ornamental. Its leaves are used as mulch and it is also nitrogen fixing.

OCOTEA USAMBARENSIS*



DISTRIBUTION

An evergreen timber tree widely distributed and common in the wetter mountain forests of Tanzania: Southern Highlands, Kilimanjaro, Usambaras, Pares, Ulugurus, Tukuyu, and Iringa (Watkins 1960).

Status : It is a reserved tree in Tanzania.

Minimum Altitude (m) :	1000
Maximum Altitude (m) :	2800
Minimum Rainfall (mm) :	1000
Maximum Rainfall (mm) :	1800

REQUIREMENTS

Soil Requirements : Prefers deep, fertile soils with good drainage (Watkins 1960).

Influential Factors : Normally immune to termites. Considerable seed is lost to gall disease. It is susceptible to *Armillarea mellea* fungus (Watkins 1960).

PROPAGATION

Means of Propagation : Root suckers, seed, and transplants.

Seeds per kg :	6600
Germination Rate (%) :	50
Germination Length :	60-90 days
Seed Sources : 2000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : The fruit is a small drupe about 1x0.5 cm in size. Collect fruits from the tree or ground. Remove outer pulp immediately by soaking in water. Pretreatment is not necessary. Seed is easily propagated, but seed viability is unknown therefore using fresh seed is advisable (Teel 1984). Seed can be stored for up to 3 months (RSCU 1992).

Seedling Management : Produces plenty of seed in commercial quantities, but good seed years ('mast') occur every 3 to 4 years. It is easily raised using 9 month old transplants or retransplanted root suckers. Regeneration by suckering and coppicing is very good (Watkins 1960). The tree can be raised by lifting natural root suckers which are produced in profusion around and near the stumps of felled trees. This practice is to be encouraged since camphor seeds are scarce except during the 'mast' year (RSCU 1992).

SILVICULTURE

Planting Types : *O. usambarensis* is a promising plantation species in Kilimanjaro. Natural camphor forests in the Usambaras and Kilimanjaro are intensively managed (RSCU 1992). The tree has a large, spreading crown, so should not be intercropped with light-requiring crops. It does not otherwise interfere with crops (Teel 1984).

Growth Factors : Fast growing. Young trees grow at 2 m per year (Dale and Greenway 1961).

Growth Cycle : Rotation length is between 60 and 75 years.

Management Systems : Produces suckers after felling, which may be controlled by cutting the roots some distance from the stump.

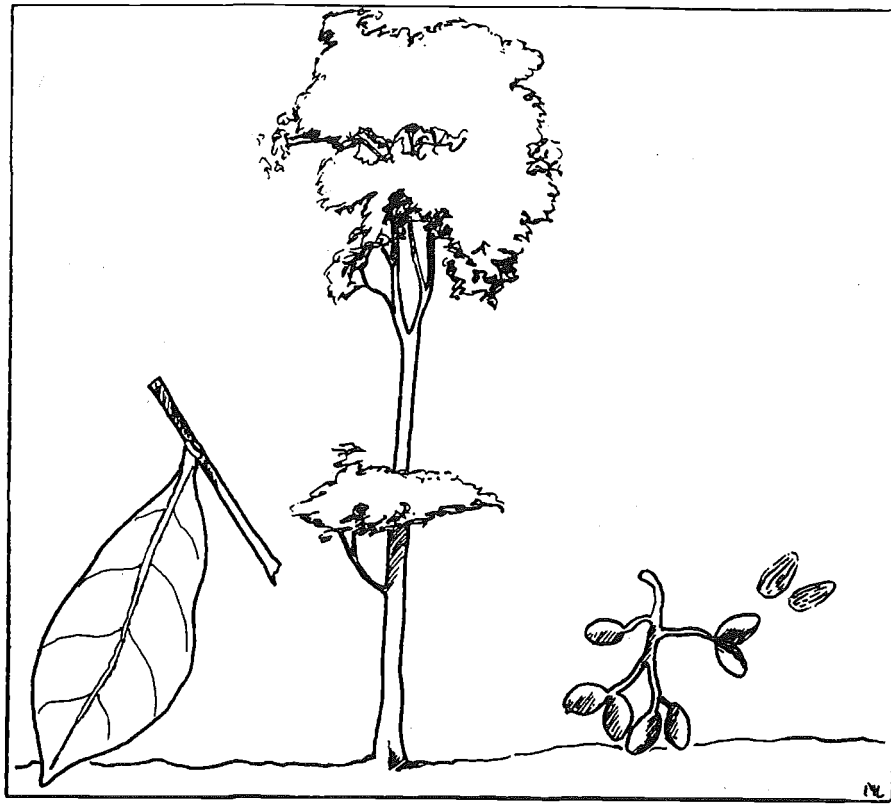
IMPORTANT USES

Use #1 : TIMBER
The tree yields one of the most valuable timbers of East Africa. It is resistant to fungal decay, wood borers, and moderately resistant to termites (Watkins 1960). *O. usambarensis* is moderately hard, heavy, and of medium strength and density. The timber is important for home construction, furniture, panelling, veneer, plywood, and heavy constructional work.

Use #2 : MEDICINE
The roots and inner bark are used in local medicine. The root bark is used to treat malaria.

Use #3 : LAND IMPROVEMENT
It is a suitable species for certain types of agroforestry practices including planting along contour strips, farm boundaries, roadsides, and in small woodlots for soil improvement (IFS 1989).

OLEA CAPENSIS*



DISTRIBUTION

It is found in lowland to upland dry evergreen forests, primarily on some of the wetter mountain slopes in the northern part of Tanzania. In Arusha it grows in the mountain forests on the southeastern slopes of Mt. Meru, and is scattered on the slopes of Mt. Kilimanjaro (RSCU 1992).

Status : Needs to be well-managed to avoid becoming rare.

REQUIREMENTS

Soil Requirements : Prefers deep, loamy, fertile soils with good drainage. It is also found on fertile but powdery volcanic soils and deep rich loams (Watkins 1960).

Minimum Altitude (m) :	750
Maximum Altitude (m) :	2600
Minimum Rainfall (mm) :	800
Maximum Rainfall (mm) :	1200
Minimum Temperature (C) :	14
Maximum Temperature (C) :	18

Light Requirements : Shade tolerant when young.

Influential Factors : Normally immune to termites. It suffers from severe browsing by buck and duiker but recovers well.

PROPAGATION

Means of Propagation : Wildlings, seed, transplants, and striplings.

Seeds per kg :	3000
Germination Rate (%) :	35
Germination Length :	2-6 months
Seed Sources : 2000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Fruit is small (< 1 cm), round, and hard, containing 1 seed per fruit. Collect ripe fruits from the ground or trees. Fruits are produced every 2 to 7 years. Soak in cold water for 48 hours to clean off all pulp, then dry in the sun for 5 days. Seed stores up to 3 months. It was noted that the seeds digested by wild pigs and bush doves germinated in 4 to 6 months. A large portion of the seed is fertile and in the forest seedlings are abundant.

Seedling Management : Germination rate seems to be low and irregular; between 2 and 9 months, with 3 to 5 months the average. Germination can occur as late as 2 years after sowing (Forest Division 1984). Seed storage requires refrigeration at low temperatures (3 degrees C). Many seedlings die off as a result of disease and damping off (Palmer and Pitman 1972).

SILVICULTURE

Planting Types : Grown in plantations in the highlands in clusters at close spacing and in combination with *Grevillea robusta* or other mixtures. It is recommended as an agroforestry species in Tanzania. It is said to not interfere with crops (Teel 1984).

Growth Factors : Growth is reported to be fast in young plants but much slower in older trees. Volumes from well-established stands have been recorded to be about 20 m^3 per ha for a 25 to 30 year period (periodic MAI) (Forest Division 1984).

Growth Cycle : Rotation length is 75 years.

Limitations to Planting : A plantation in Usa was totally destroyed by elephant browsing.

Management Systems : Planting should be done during the wettest part of the year. It is necessary to reduce the risk of browsing damage by outplanting tall seedlings (1.8 m) with all the lower leaves stripped off and only the terminal pair remaining (Forest Division 1984). It can be planted in groups with *Grevillea robusta* serving as a nurse tree at a spacing for *Grevillea* of 2.4x2.4 m and about 9 plants of *O. capensis*, with an internal spacing of 1x1 m. It can be planted at intervals of 7 to 8 m. It tolerates lopping, pollarding, and coppicing.

IMPORTANT USES

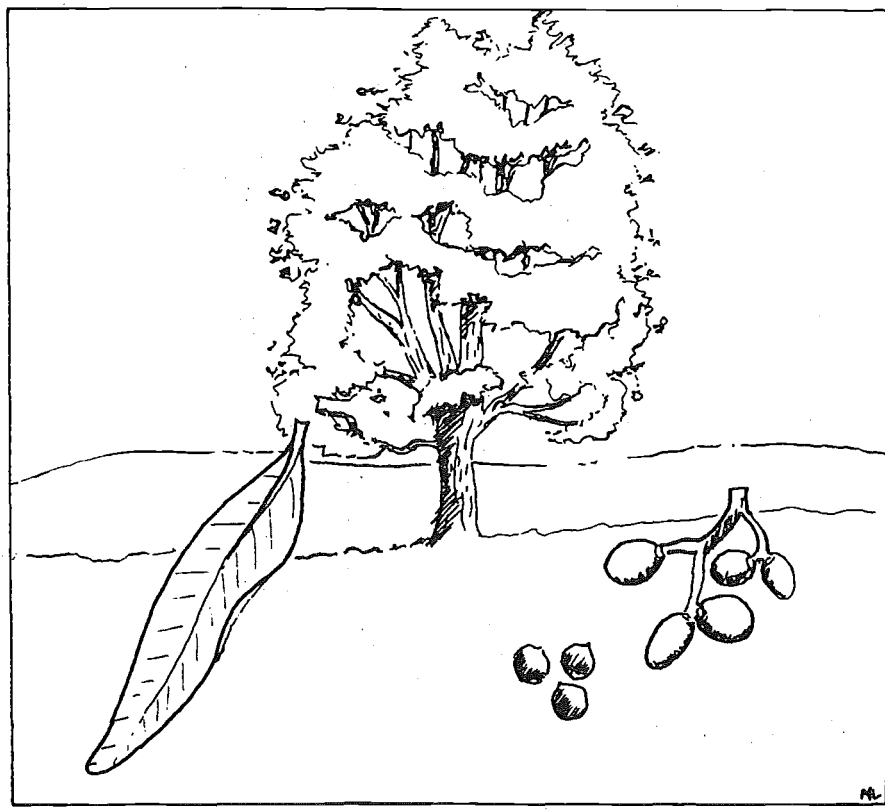
Use #1 : FUELWOOD
Firewood from *O. capensis* is reported to be the best in Tanzania. It also makes excellent charcoal.

Use #2 : TIMBER
The timber is heavy, strong, durable, and termite resistant. It is used extensively for heavy construction purposes, veneers, building materials, and furniture. Planting in groups at close spacing produces a good source of withers, and well formed trees can be used for timber.

Use #3 : FODDER
O. capensis is a useful fodder tree as the pods, seeds, and leaves can all be used for this purpose.

OTHER USES : The bark is used in local medicine.

OLEA EUROPAEA



DISTRIBUTION

A tall tree or stunted shrub able to tolerate extreme soil and climate conditions. It is widely distributed in dry forest and forest margins. In Tanzania it is found in drier mountain areas of Usa, Kilimanjaro, Pare, and Mbulu (RSCU 1992).

Minimum Altitude (m) :	700
Maximum Altitude (m) :	3000

REQUIREMENTS

Soil Requirements : Prefers good forest soil and sites with lime rich soils.

Influential Factors : It is hardy and tolerant of drought and frost once established.

PROPAGATION

Means of Propagation : Wildlings, seed, and cuttings.

Seeds per kg :	14500

Seed Treatments : Fruit is small (1 cm), round and hard, containing 1 seed per fruit. The fruit pulp should be removed and the seeds dried before transporting or storing.

Pretreatment is not necessary for fresh seeds. Soak old seed in water for 48 hours (RSCU 1992). They can be stored for about 2 months.

Seedling Management : The species is a poor seeder and germination rates are generally low (RSCU 1992).

SILVICULTURE

Planting Types : Planted along boundaries, roads, and near home compounds. Root growth is very extensive under the soil, and may compete in agroforestry situations.

Growth Factors : Generally believed to be slow growing, but grows rather quickly under good conditions. It is very hardy (Palmer and Pitman 1972).

Limitations to Planting : Seedlings are difficult to raise.

Management Systems : Commercial edible olives can be successfully grafted onto *O. europaea* (Palgrave 1988).

IMPORTANT USES

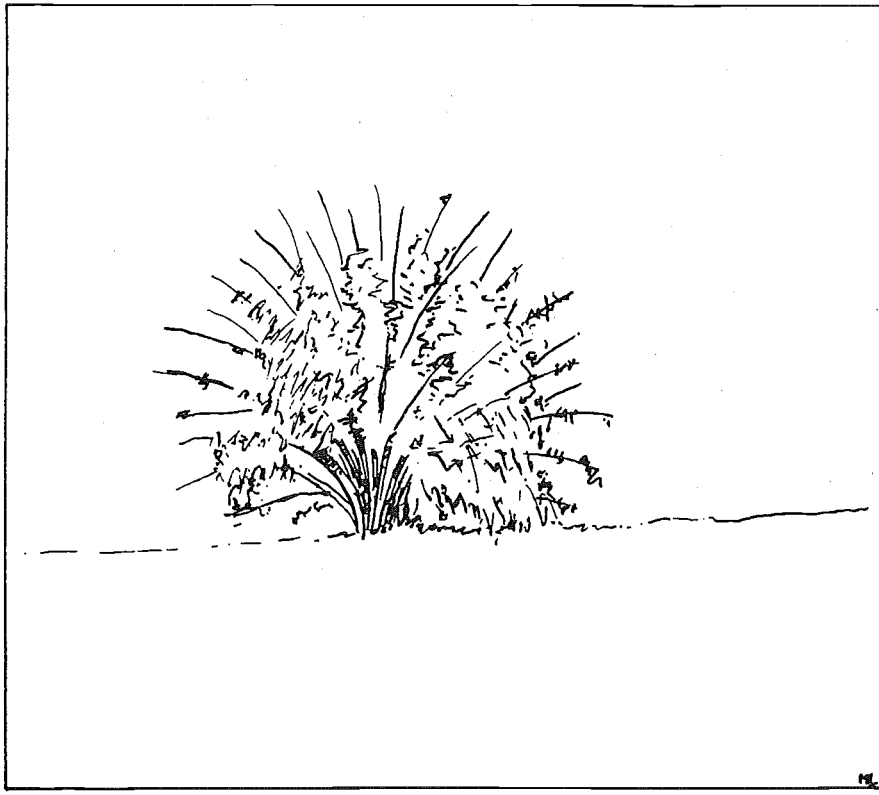
Use #1 : MEDICINE
An infusion of bark is used to relieve colic. Leaves are used as a gargle for sore throats and an infusion of leaves is used as an eye lotion for humans and animals (Palgrave 1988). Sticks are also used and sold for toothbrushes.

Use #2 : FUELWOOD
It is a pleasant smelling firewood. It makes good charcoal and firewood because of its high density and calorific value. However, it is thought to be too slow growing to raise for only this purpose.

Use #3 : GENERAL PURPOSE WOOD
The wood is close grained, hard, and very strong. It works well and takes a nice finish. It is highly regarded for furniture, flooring, carvings, water containers, and walking sticks. It is also used for fencing. Another important use is for milk storage containers. It is regarded as one of the best woods for this purpose.

OTHER USES : The fruits are edible and its flowers attract bees.

OXYTENANTHERA ABYSSINICA*



DISTRIBUTION

A large herb grass (bamboo) growing in open grassland, lowlands, and highlands, often on hills or along intermittent watercourses. It is widespread but irregular although generally close together in pure stands. Most hardy of the 3 African species, it is often found on very poor soils in Tanzania (RSCU 1992).

Minimum Altitude (m) :	500
Maximum Altitude (m) :	2000

REQUIREMENTS

Soil Requirements : Slopes and well-drained soils. It can be found on very poor soils.

Influential Factors : Survives fire in its natural habitat.

PROPAGATION

Means of Propagation : Cuttings and rhizomes like sugar cane. Seed is rare.

SILVICULTURE

Planting Types : Has potential for agroforestry and for planting around homes.

Growth Factors : Very fast growing.

Growth Cycle : Flowering occurs gregariously over wide areas about every 70 years. The clump dies and sprouts 1 year later from rhizomes. Evidence indicates that each plant flowers once in its life time and then dies (Palgrave 1988).

Management Systems : Needs to be controlled by cutting.

IMPORTANT USES

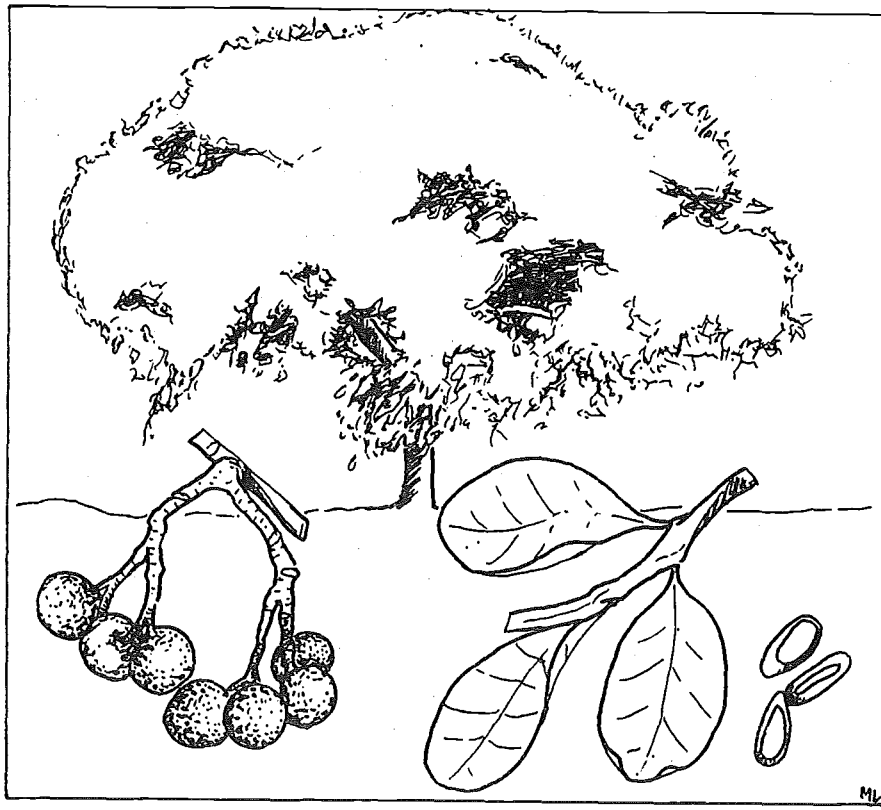
Use #1 : BEVERAGE
It is used in the production of alcohol and wine. In parts of Tanzania women depend on this species for local beer production as a major source of income.

Use #2 : FIBRE
It is used to make various types of local baskets for transporting produce, such as tomatoes in Iringa.

Use #3 : BUILDING MATERIALS
It is in high demand as a building material. It is used for scaffolding, furniture, general house construction, and fencing. Fences are susceptible to damage by termites and borers. The small stems are used for pipes and arrow shafts.

OTHER USES : It is used for soil erosion control and the rehabilitation of degraded sites.

PARINARI CURATELLIFOLIA*



DISTRIBUTION

The tree is widely distributed in Tanzania on flat ground, on sandy soils in open deciduous woodland near the coast; in savannah areas; several types of woodland, especially near water; and scattered in upland grassland (FAO 1983). It is found in Kondoa district, around Lake Victoria, and in western *Brachystegia* deciduous forests. Dense stands are found in Iringa and Mbeya regions.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1900
Minimum Rainfall (mm) :	400
Maximum Rainfall (mm) :	2300
Minimum Temperature (C) :	10
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Prefers light yellowish-brown to reddish-yellow, gritty, sandy clay loams, red to dark red friable clays with laterite horizon, and yellow-red loamy sands (FAO 1983).

Influential Factors : Some farmers believe that this tree is an indicator of a high water table (Palmer and Pitman 1972). It is resistant to fire.

PROPAGATION

Means of Propagation : Seed and wildlings. The tree coppices naturally.

Seeds per kg :	300

Seed Treatments : *P. curatellifolia* prolifically bears rounded, olive-green fruits 2.5 to 3.8 cm in size, but on an erratic basis. It may bear fruit only every other year. When mature, the fruits turn yellow-red and fall to the ground. There is 1 kernel per fruit, which is pulpy, similar to a mango. Fruits collected for propagation should be checked for insect infestation which affects seed viability. After collection, fruits should be protected from insects. Pretreatment is not necessary but would improve germination (FAO 1983). The seed can be stored.

Seedling Management : Little is known about propagation by seed but the hard seed coat may hinder germination. Natural regeneration is predominantly by root suckers, which appears feasible and adequate in areas where the species is semicultivated on farm land.

SILVICULTURE

Planting Types : Persists in cultivated lands and secondary bushland.

Growth Cycle : Flowers and fruits concurrently during the wet and dry seasons. It takes about 9 months from flower fertilization to fruit ripening. It flowers from June through January, and fruits from August to May in the Lushoto Herbarium (FAO 1983).

Management Systems : Potted nursery stock could be planted in partially cleared fields.

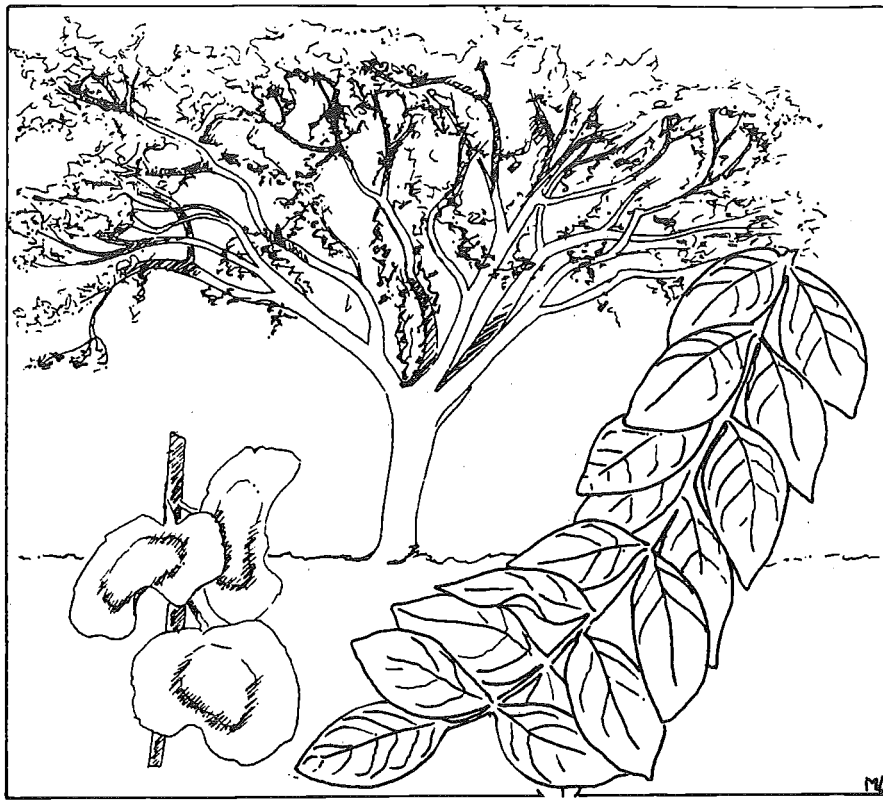
IMPORTANT USES

Use #1 : FRUIT
It is considered to be one of the best fruits of tropical Africa (Tredgold 1986). In Tanzania it is sold in the market. The fruits can be sun dried and stored for reserve food. The seed kernel has a high oil content which is edible and oil can be extracted from it. The oil is used in cooking and in paint and varnish.

Use #2 : MEDICINE
The bark is used to treat pneumonia and as an infusion to treat fever. It is also applied to fractures.

Use #3 : GENERAL PURPOSE WOOD
The wood is hard, heavy, borer proof, and reddish. It makes very good rafters and canoes. It is also used for firewood.

PTEROCARPUS ANGOLENSIS*



DISTRIBUTION

Widespread in Tanzania throughout the woodland in the coastal plain; in savannah woodlands and grasslands in Kilwa, Lindi, Morogoro, and Tabora (RSCU 1992); in Miombo savannah; and in Miombo dry forests as scattered trees. It is found in the north to Lake Victoria (Borota 1975). It probably prefers sites with more alkaline soils and an open understorey.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1650
Minimum Rainfall (mm) :	700
Maximum Rainfall (mm) :	1500

REQUIREMENTS

Soil Requirements : Adaptable to red loams and deep sandy soils, but not coastal sands or black clays. Prefers soils whose physical characteristics permit water to rapidly drain down the profile, at least through the top 30 cm (Boaler 1966).

Light Requirements : Demanding.

Influential Factors : *P. angolensis* is able to survive annual fires after the tree has reached pole size. It is sensitive to frost. Young seedlings may be susceptible to termites and crickets (Borota 1975).

PROPAGATION

Means of Propagation : Seedlings and stumps.

Seeds per kg :	4200
Germination Rate (%) :	50
Seed Sources : 4000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : Pods are winged, disc-shaped with a diameter of 8 to 10 cm, and contain 1 or 2 seeds. The pods do not split open, and must be opened manually. Boaler notes that it is difficult to open the pods without damaging the seeds (1966). Seed which has been filed or scarified germinates more readily than untreated seed, but even this may have limited results. Chipping the fruit at one edge hastens germination (Nwoboshi, 1982). Repeated wetting and drying induces fruit opening, after which the seed will germinate inside the open fruit (Boaler 1966). Burning may also assist fruit opening and germination. About 50% of *Pterocarpus* fruits contain seed and the remainder are barren.

Seedling Management : It is reported that cuttings grow well but that they must be planted when the sap is rising (October in southern Africa) (Palmer and Pitman 1972). Boaler (1966) reports 0 to 30% success by vegetative propagation. Best success occurred when using young, vigorous shoots cut and put into the ground, just before the prerain flush in September in Tanzania. Such cuttings need regular watering after planting.

Nursery stock can be left to develop to striplings or to bare-rooted stock with a long shoot of 1 to 2 m. The root system is only slightly pruned off. Seedlings are stripped of leaves before transporting to the planting site in order to reduce transpiration losses (Nwoboshi 1982).

SILVICULTURE

Planting Types : Grown in woodlots, plantations, and around homes as live fences.

Growth Factors : Slow growth is reported in Dodoma.

Growth Cycle : The tree has a rotation length of 40 to 75 years. Life expectancy is 60 to 90 years. *P. angolensis* begins to produce fruit at about 20 years of age, but fruiting is light until 35 years. Trees will continue to produce fruit until they die (Boaler 1966). Fruits are collected from the ground from August through October.

Management Systems : Site preparation requires clear cutting, control of fire and of competition for the first 10 years of the plantation (Boaler 1966). Spacing in a pure stand should not be closer than 5x5 m.

In the seedling stage, the above ground parts of the plant die back each year until the root system has grown sufficiently to support a shoot capable of surviving the dry season. Shoots rarely grow more than 15 cm. This makes using the species difficult in plantation forestry (Boaler 1966). Boaler lists 4 external conditions necessary for the most rapid growth from seedling to sapling: full light, absence of fire, no root competition, and adequate supply of mineral nutrients. Annual burning is said to slow the development of seedlings but promotes sapling growth.

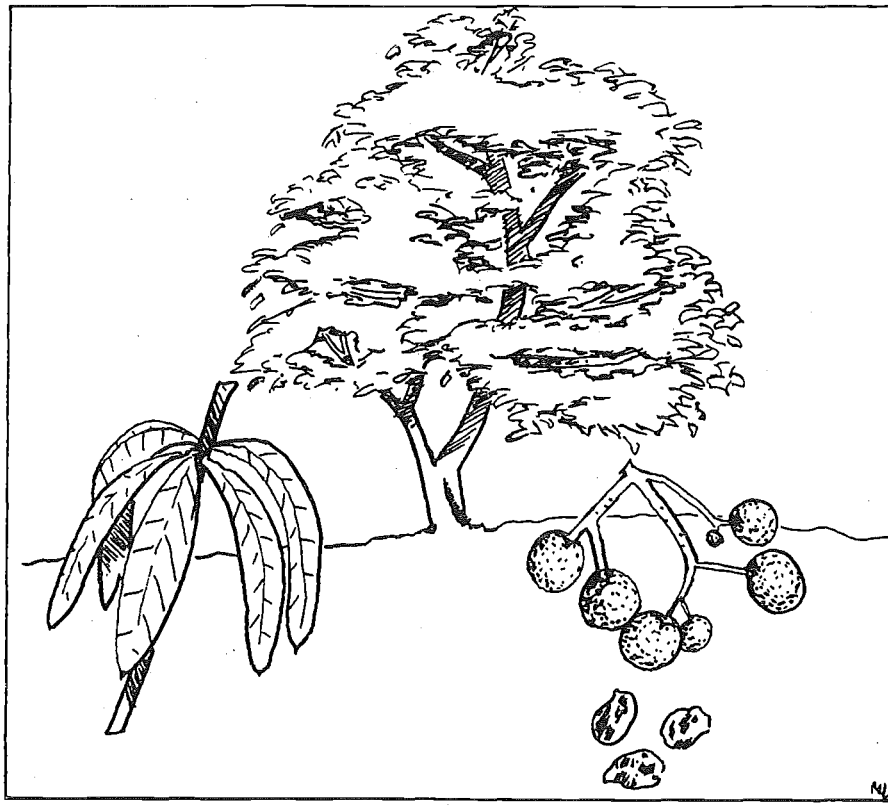
IMPORTANT USES

Use #1 : TIMBER
One of the best known, most generally used and most valuable of all woods in southern tropical Africa. Very durable, strong, medium hard and dense, it is easy to work, (Borota 1975) and is heavily exploited. It is used as a general purpose timber, for furniture, boat construction, for poles, and occasionally for firewood.

Use #2 : MEDICINE
It is used to treat numerous diseases throughout Africa. The root is believed to cure malaria, black water fever, and gonorrhoea (Palgrave 1988). The bark is used as a general purpose treatment for headaches, stomach aches, mouth sores, and rashes.

Use #3 : LAND IMPROVEMENT
P. angolensis is nitrogen fixing and is used for soil conservation, dune fixation, and as an ornamental. Leaves and shoots are also used as fodder and it is regarded as a good bee plant.

RAUVOLFIA CAFFRA*



DISTRIBUTION

The tree is widely distributed in riverine *Brachystegia* woodlands, lowland rainforests, dry montane forests and montane rainforests, in swamps and riverine forests (FAO 1986). It is found in Kilimanjaro, Tanga, Coast, Iringa, Dodoma, Arusha, and Morogoro.

Minimum Altitude (m) :	500
Maximum Altitude (m) :	2100
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1270
Minimum Temperature (C) :	16
Maximum Temperature (C) :	24

REQUIREMENTS

Soil Requirements : Appears to be adapted to fairly fertile soils that are well-drained. It prefers loamy sands to sandy loam soils but is also common in volcanic rocks which may indicate that it has adapted to fairly fertile soils (Forest Division 1984).

Light Requirements : Requires shade when young, but old trees do not tolerate shade.

Influential Factors : Proximity to ground water or rivers appears to be essential if rainfall is lacking or during the dry season.

PROPAGATION

Means of Propagation : Seed and stumps. It is easily grown by seedlings. The tree naturally regenerates by coppice, suckers, seed, and root suckers.

Seed Treatments : Fruits are small round drupes, about 1.3 cm in diameter, becoming black and wrinkled when mature. There are 1 or 2 seeds per fruit. Extract seeds from ripe fruits by soaking in water; no other pretreatment is necessary. Plant immediately, as seeds rapidly lose their viability (Forest Division 1984). Seedlings reach 24 to 30 cm in height in 6 months, and may be then outplanted (Forest Division 1984).

Seedling Management : Seed germinates after staying on the forest floor for a long time (FAO 1986). In Lushoto wildlings that were picked, potted, and planted after 8 months all died the following season.

SILVICULTURE

Planting Types : *R. caffra* is used in agroforestry systems (highland coffee and banana fields). Once economic products are determined, large scale plantations may be feasible. Trees should not be raised near dwellings, as some parts of the tree are poisonous, and may be toxic to children and livestock.

Growth Factors : A fast growing, easily cultivated tree, often grown in gardens in southern Africa (Palmer and Pitman 1972). In Kenya it was reported to grow to 27 m in wet forests (Dale and Greenway 1961).

Growth Cycle : In Tanzania, flowering occurs during the long rains, and fruit ripens during the dry season extending into the short rainy season, February to November (FAO 1986).

Management Systems : There is a need to overcome problems of dieback.

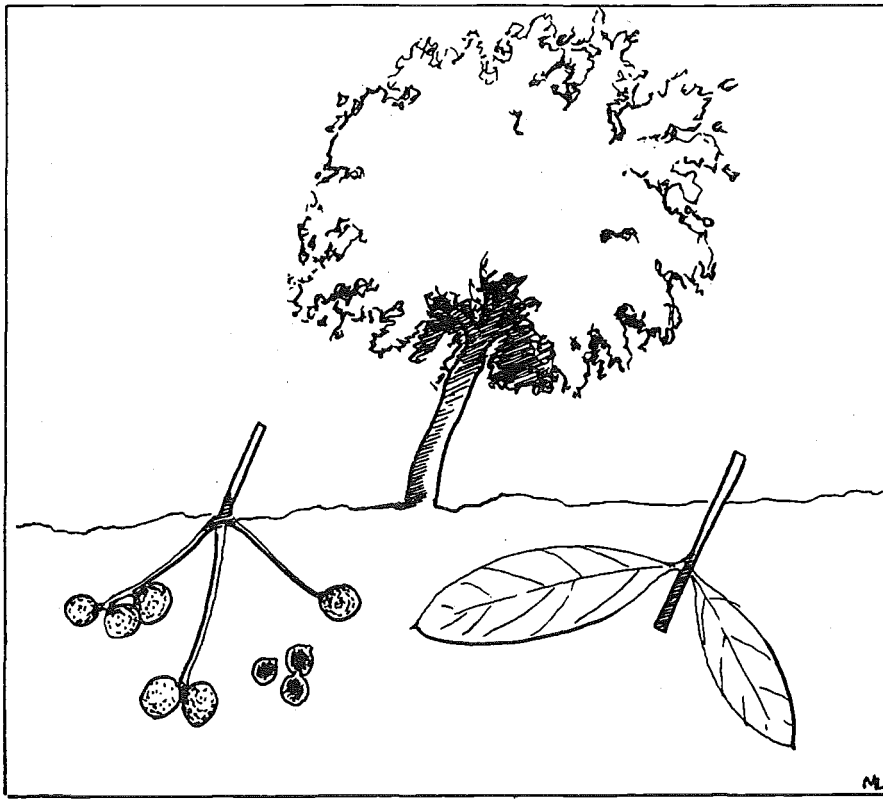
IMPORTANT USES

Use #1 : MEDICINE
R. caffra has many traditional medicinal applications as well as established modern pharmaceutical uses. The bark is used to treat rheumatism, pneumonia, and colic. The root is used for insomnia, and intestinal worms. It is also used to treat malaria, hypertension, and psychosis (Rulangaranga 1989).

Use #2 : GENERAL PURPOSE WOOD
The wood is rather soft and not durable. It is used for poles, domestic items such as spoons, tool handles, containers, and pipes and as firewood.

Use #3 : BEE PLANT
It is an important plant in beekeeping in Tanzania due to its small white pleasantly scented flowers.

SALVADORA PERSICA



DISTRIBUTION

S. persica is widespread in all districts of Tanzania, notably in thorn shrubs, desert flood plains, and grassy savannah (RSCU 1992). It is also found in valleys, on dunes, and termite mounds. It is found where ground water is readily available, on river banks, on the perimeters of waterholes, in seasonally wet sites, and along drainage lines in arid zones.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1800
Minimum Rainfall (mm) :	300
Maximum Rainfall (mm) :	1000

REQUIREMENTS

Soil Requirements : Adapted to alkaline or very saline soils, usually clay-rich, and soils without salt. It prefers clays, but is found on loams, black soils, and sand (FAO 1988).

Influential Factors : Extremely well-adapted to arid conditions, is salt tolerant and very drought resistant. Cultivated seedlings and trees must be protected from browsing by animals (FAO 1988). The tree produces many branches.

PROPAGATION

Means of Propagation : Readily germinates from seed and coppices well.

Seeds per kg :	3400
Germination Length :	24 hours

Seed Treatments : Fruits are small, round, and pea-sized, bearing 1 seed per fruit. Seeds turn from white to pink or purple-red and are semi-transparent when mature. Pretreatment is not necessary (RSCU 1992). Seeds exhibit no dormancy but the fruit pulp contains germination inhibitors which should be removed before sowing. Seed can be stored for about 1 month.

Seedling Management : Seedlings have been raised in the nursery 3 years prior to planting (FAO 1986).

SILVICULTURE

Planting Types : Grown in plantations or hedges. The tree has potential for reclaiming saline soils.

Growth Factors : *S. persica* is slow growing.

Management Systems : Coppices well. Branches are cut repeatedly to produce short stems that are harvested for toothbrushes (FAO 1986).

IMPORTANT USES

Use #1 : TOOTHBRUSHES
Young stems of 3 to 5 mm are used as toothbrushes and sold in most major markets throughout Tanzania. A toothstick is also said to relieve toothache and gum disease, and the leaves are used as a mouthwash and for tooth and gum problems. The bark is said to contain an antibiotic which suppress growth of bacteria and the formation of plaque in the mouth (RSCU 1992).

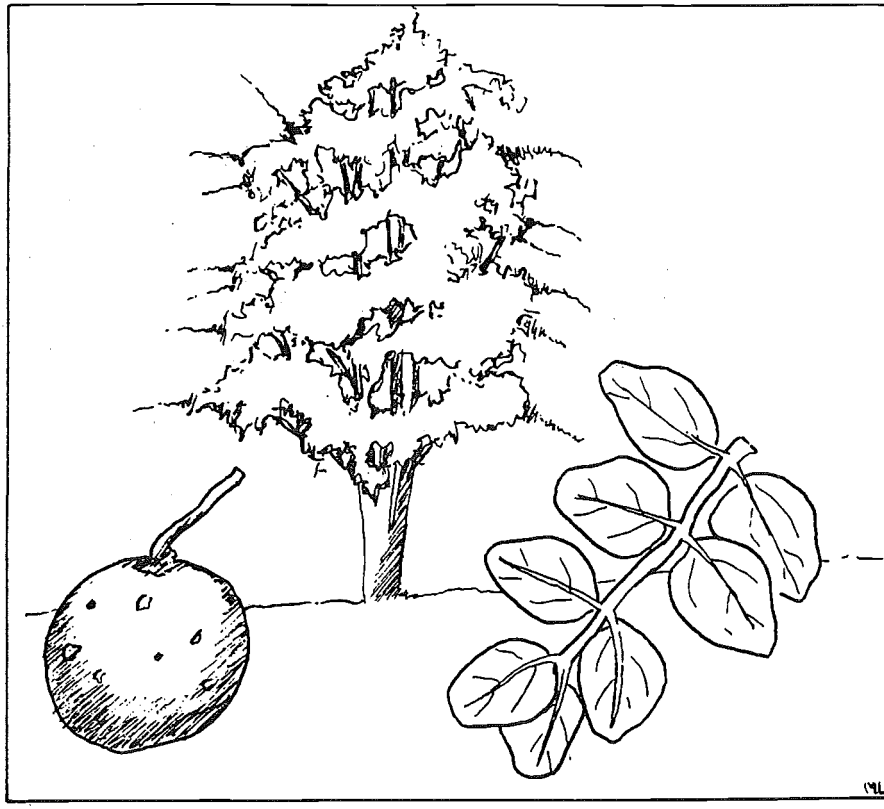
Use #2 : MEDICINE
The roots are prepared as a salve and rubbed on the face for headaches. They are used for general body pain, gonorrhoea, back pains, chest diseases, and stomach aches. Latex from the bark is used for treating sores. Seeds are used as a tonic and seed oil is used on the skin for rheumatism.

Use #3 : FODDER
Leaves make good fodder as they have a high water content (15 to 36%) and are rich in minerals (FAO 1986). The leaves are readily consumed by goats and cattle and the fodder is available during the dry season. The high salt content of the leaves is said to affect the taste of the milk.

NOTES

The leaves and bark contain the alkaloid trimetylamine. The seed is rich in oil and contains lauric, myristic, and palmitic acids. There is potential for making soaps, candles, and using it as a substitute for coconut oil (FAO 1986).

STRYCHNOS COCCULOIDES*



DISTRIBUTION

A small tree growing in woodlands, mixed forests, deciduous woodlands, lowlands, and Miombo woodlands (FAO 1983). It is widespread throughout Tanzania in *Brachystegia* woodlands and is found in Iringa, Ruvuma, Dodoma, Kigoma, Tabora, and Tanga.

Minimum Altitude (m) :	400
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	600
Maximum Rainfall (mm) :	1200
Minimum Temperature (C) :	14
Maximum Temperature (C) :	25

REQUIREMENTS

Soil Requirements : Prefers sites on deep sandy soil and on rocky slopes (Palmer and Pitman 1972). It is found on black to dark-grey clays and yellow-red loamy sands (FAO 1983).

Light Requirements : Demanding.

Influential Factors : *S. cocculoides* is usually left when fields are cleared. It prefers open growing conditions. Saplings need to be protected from fire.

PROPAGATION

Means of Propagation : Seed, coppice, and root suckers.

Seed Treatments : The large fruits, 7 to 13 cm in diameter, are hard shelled and smooth, and light-green or yellow in colour. The fruits contain bony seeds which are said to be poisonous (Palmer and Pitman 1972). The hard seed coat requires pretreatment. It is recommended that fresh seed be soaked in hot water for 24 to 48 hours (RSCU 1992).

Seedling Management : Seeds do not germinate readily. Annual fires soften the coat. Root suckers are easily produced by wounding the tree (fire, trampling by animals).

SILVICULTURE

Planting Types : Planted along boundaries and near home compounds.

Growth Factors : Fairly fast growing.

Growth Cycle : Flowers during the rainy season and fruits ripen in the dry season. The fruit can take up to a year to ripen.

Management Systems : The species is semicultivated. It can be raised in the nursery and planted on a cleared site. Weeds and climbers need to be cleared until trees are established. The tree coppices well.

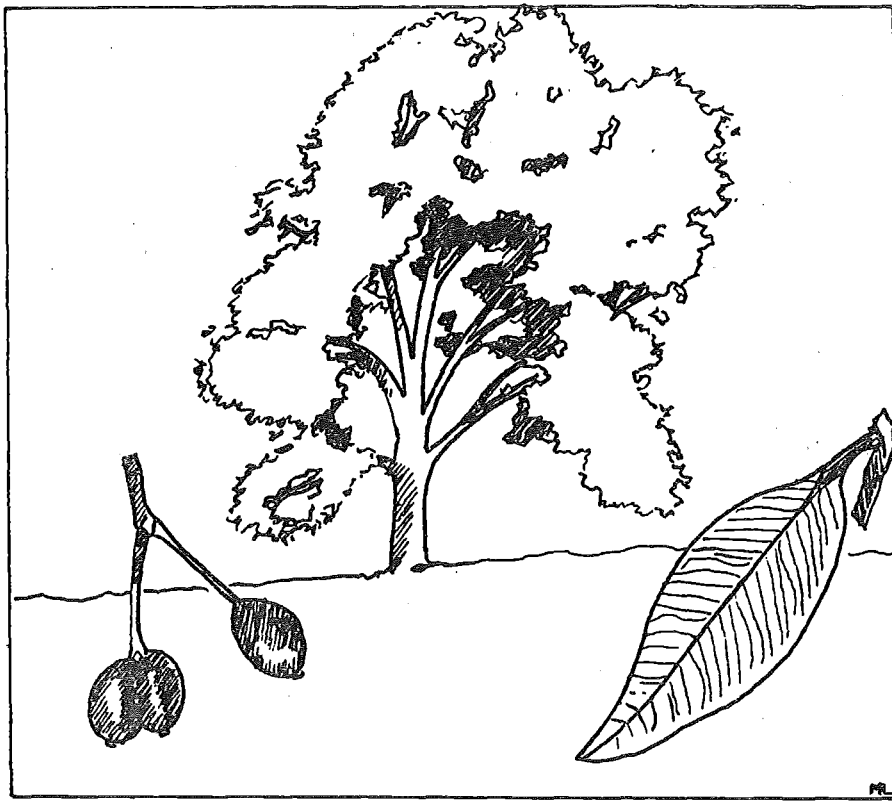
IMPORTANT USES

Use #1 : MEDICINE
The fruit is mixed with honey or sugar to treat coughing. The root can be chewed to alleviate eczema and is an alleged cure for gonorrhoea (FAO 1983).

Use #2 : FRUIT
The ripe fruit is eaten mainly by children, but also by adults. It has a pleasant taste. The tree is often retained and protected because of the fruit. The fruit is also used to make a dye to colour trays and containers which provides protection from insect attacks. It is used as a soap for washing clothes.

Use #3 : GENERAL PURPOSE WOOD
The wood is white and tough, rather soft, and pliable. It is used primarily for building materials and tool handles.

SYZYGIUM GUINEENSE*



DISTRIBUTION

The tree is widespread on the Tanzanian mainland in lowland and mountain rainforests, forest fringes along streams, riverine and swampy forests. It is also found in open *Brachystegia-Faurea* woodlands (FAO 1983).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2100
Minimum Rainfall (mm) :	1000
Maximum Rainfall (mm) :	2300
Minimum Temperature (C) :	10
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Prefers permanently fresh, moist, well-drained soils with a high water table (RSCU 1992).

Light Requirements : Strongly demanding.

Influential Factors : Liable to attack by a *Cerambycid* beetle larva which can make the timber defective (Sommerlatte 1990).

PROPAGATION

Means of Propagation : Potted seedlings, wildlings, direct sowing, and coppicing.

Seeds per kg :	3000
Germination Rate (%) :	85
Germination Length :	25-30 days
Seed Sources : 800 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : Fruit is oval, up to 2.5 cm long, containing a single large stone. Edible fruits turn purple-black and juicy when mature. Pretreatment of the seed is not necessary, however it must be sown immediately as the seed may spoil within 24 hours if stored (RSCU 1992).

Seedling Management : Germination is very good and uniform. Direct sowing in pots is a recommended propagation technique. For successful germination and establishment, the seed should be exposed to mineral soil and moisture (FAO 1983). Natural regeneration is adequate in natural forests.

SILVICULTURE

Planting Types : Palmer and Pitman note that this species has probably never been cultivated in southern Africa, although it has occasionally been preserved in gardens. It has an ability to hybridize with other species in the genus, and is 'appallingly variable' (Dale and Greenway 1961).

Growth Cycle : Fruit ripens between February and May (FAO 1983).

Management Systems : Planted on cleared sites. Tolerates pollarding and is able to coppice. Crop refining in natural forests could increase growth potential (FAO 1983).

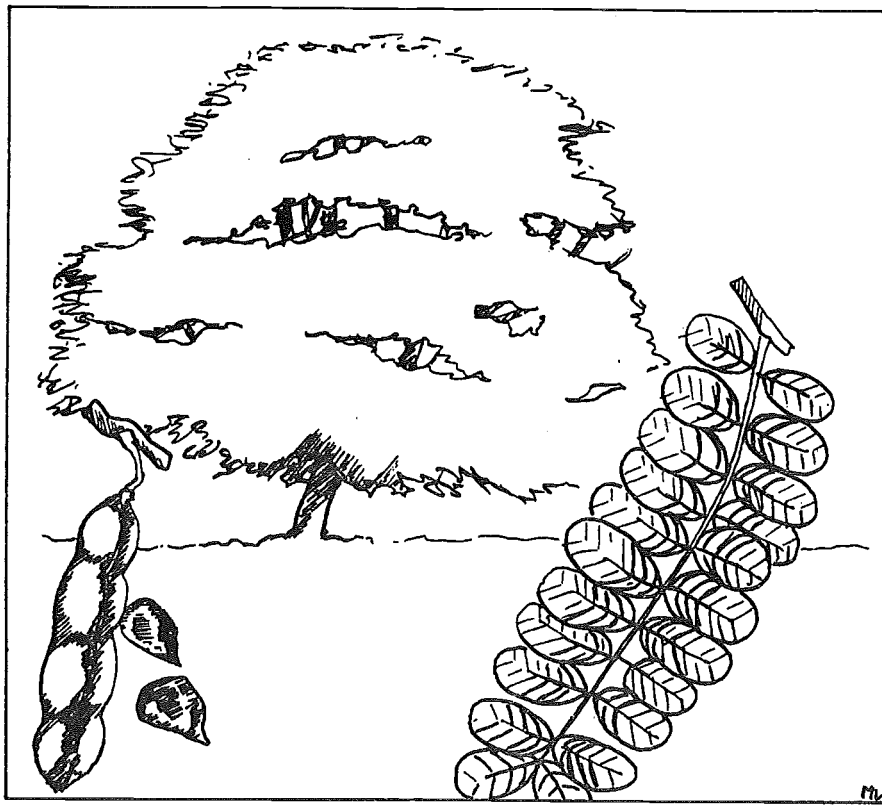
IMPORTANT USES

Use #1 : FRUIT
The fruits are highly regarded especially by children. Ripe fruit is generally picked from the tree. It must be picked immediately from the ground so that it does not spoil.

Use #2 : MEDICINE
The fruit is used to treat dysentery and the bark is used for diarrhoea.

Use #3 : GENERAL PURPOSE WOOD
The wood is hard, strong and easy to work. It is used for construction material, timber, firewood, and charcoal. The smoke from burning wood is used to season milk containers.

TAMARINDUS INDICA*



DISTRIBUTION

A very adaptable species occurring throughout Tanzania in woodland, bushland and thorn bush areas, and in depressions and valleys. *T. indica* is often found growing along watercourses, ponds, and riverbanks. It does not grow in marshy or stagnant water or clogged soils. It avoids seasonally flooded and waterlogged sites although it may occur on or beside raised microsites such as termite mounds and anthills (Kew 1984). *T. indica* often occurs in the same conditions as the baobab.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1500
Minimum Rainfall (mm) :	600
Maximum Rainfall (mm) :	1000
Minimum Temperature (C) :	20

REQUIREMENTS

Soil Requirements : Tolerates a wide range of soils. *T. indica* grows in coastal sands, rocky soils, wet soils, but it requires well-drained sites. It prefers sandy or deep alluvial soils, with water at depth (RSCU 1992).

Light Requirements : Demanding. It does not appear to regenerate underneath its own canopy (Parrotta 1990).

Influential Factors : Seedlings need to be protected from frost and browsing livestock. The tree is susceptible to fire, and is very sensitive to frost. Many insects attack the fruits and seeds, none causing serious damage (Parkash 1991). It is able to withstand drought.

PROPAGATION

Means of Propagation : Usually propagated from seed but wildlings, root suckers or cuttings may be used.

Seeds per kg :	1000
Germination Rate (%) :	90
Germination Length :	10 days - 2 months
Seed Sources :	1200 TSH per kg - Tanzania National Seed Centre 1991.

Seed Treatments : Pods are variable, curved and oblong, and about 20 cm in length. They contain from 1 to 10 seeds each, which are connected by tough fibres running through sticky pulp (Dale and Greenway 1961). Seed pods should be collected from healthy trees during the early part of the year. Soak the fruit to remove the pulp, extract seeds from the pods and allow them to air dry before winnowing. Clean, dry seed may be stored in gunny bags in a cool, dry place. No pretreatment is required. The seed germinates readily and grows well in pots.

The Forest Division notes that it is customary in Tanzania to pretreat seed before planting by soaking in cold water for 24 hours, although even with pretreatment germination is irregular and may take up to 2 months (Forest Division 1984). Seed retains its viability for about 6 months (Parkash 1991) but can be stored for more than 2 years if protected from insects (RSCU 1992).

Seedling Management : It is known to coppice and respond to root exposure and injury by root sucker production. These characteristics could be taken advantage of if *T. indica* were grown for wood and charcoal (Forest Division 1984). Direct sowing is often the best method of propagation (Parkash). Place seeds directly in holes 30 cm deep, 5 cm apart, in lines that are 4 to 5 m apart. It may also be sown in patches with 8 to 10 seeds per patch. Other reports indicate that the viability is relatively good and that seeds can be directly sown in nursery beds or open ground (FAO 1983).

SILVICULTURE

Planting Types : Recommended for planting in the interior lowlands and wetter parts of the semiarid zone in Tanzania. It is popular for agroforestry in Tanzania. *T. indica* is not recommended as a shade tree due to allelopathic effects on understorey plants (Parrotta 1990). It is used along roads and for boundary plantings.

Growth Factors : Grows slowly, but is considered a promising species in Dodoma. Fruit yields of 150 to 200 kg per year per tree (12 to 16 tonnes per ha) have been reported (Forest Division 1984).

Growth Cycle : Tamarind begins flowering and fruiting from 6 to 15 years of age, producing abundant fruit crops almost every year thereafter. The tree is long lived, over 200 years in some cases (Forest Division 1984). The suggested rotation for timber is 50 to 60 years. Fruits are edible in June and July.

Management Systems : Outplant when the rainy season begins. It should not be planted in low areas where the roots may become waterlogged. In some countries it is planted at a spacing of 5x5 m, which may be thinned to 10x10 m as the trees mature; linear spacing is 10 to 15 m (Parkash 1991). It is used also as a firebreak and planted at spacings of 2.5x2.5 m or 3x3 m for firewood plantations. Weeding is required during the first year, with hoeing around the trees until they are well-established. Plantations may be established by direct sowing along cleared lines (Parrotta 1990). It coppices well.

TAMARINDUS INDICA*

IMPORTANT USES

Use #1 : FRUIT
It is eaten by people either directly, as a condiment, or as a drink. The fruits are sold in the market in Dodoma. It is an excellent source of vitamin B (thiamine and niacin) and contains small amounts of carotene and vitamin C (Parrotta 1990).

Use #2 : MEDICINE
The tree has many medicinal uses in Tanzania. The fruit pulp is used as a laxative, the bark is used to cure sore throats, the leaves are used for stomach problems, and the roots are used to treat heart pains. Crushed leaves are put on wounds and abscesses. Juice from crushed leaves is taken with porridge to stop vomiting.

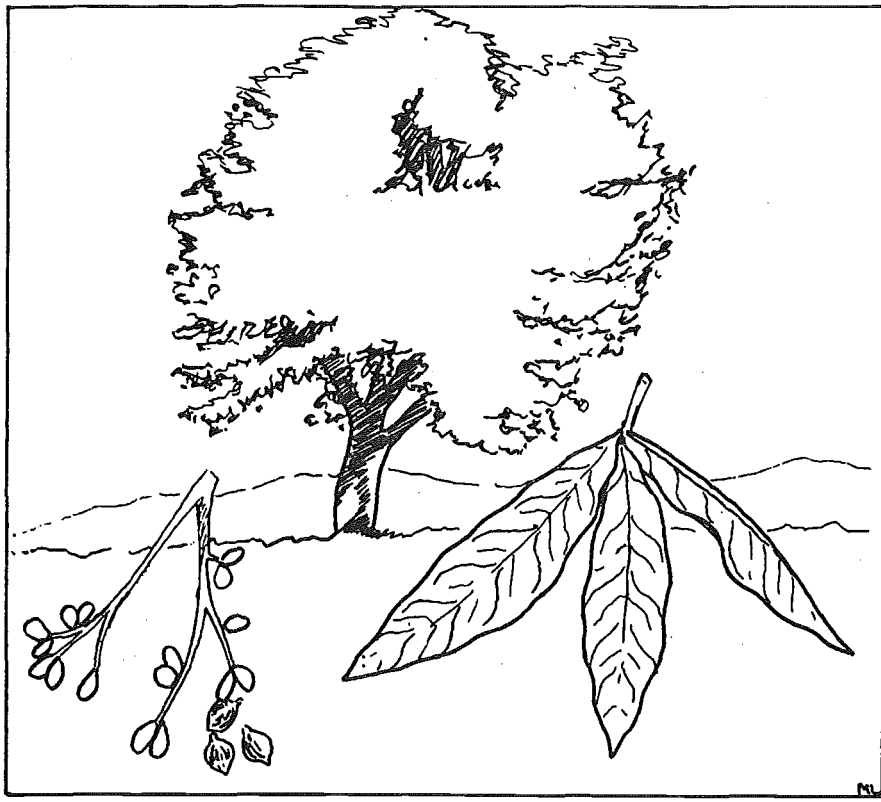
Use #3 : GENERAL PURPOSE WOOD
The wood is hard, heavy, and dark brown. It is difficult to work but easy to polish and termite resistant. It is used to make furniture; as a timber; to make domestic items such as tool handles, pestles and mortars; for fence posts; and boats. It is also regarded as a good firewood and charcoal.

OTHER USES : The flowers are reported to make good honey (Parrotta 1990). Ash, which is rich in tannin, is used for tanning hides. The tree is host of one of the wild silkworms (*Hypsiodes vuillitti joannis*).

NOTES

It is one of the most widely used trees in its range and should receive more attention in forestry and research activities.

TECLEA NOBILIS



DISTRIBUTION

T. nobilis is widely distributed in wet highland forests, particularly in northern Tanzania and the Lake zone. It is found in bushland and savannah, often with *Podocarpus* and *Juniperus* (RSCU 1992). In Kenya it is a large forest tree, but grows as a small forest undershrub in Uganda (Dale and Greenway 1961). *T. nobilis* prefers sites in highland forests between the altitudes of 1700 and 2700 m.

Minimum Altitude (m) :	900
Maximum Altitude (m) :	2700

PROPAGATION

Means of Propagation : Seeds.

Seeds per kg :	20000

Seed Treatments : Fruit is red, about 2 cm long, with a single seed. No seed treatments are recommended.

Seedling Management : It is not a prolific seeder and the germination rate is low.

SILVICULTURE

Planting Types : Reported to be compatible with crops, but experience is quite limited (Teel 1984).

Growth Factors : Moderate to slow growing.

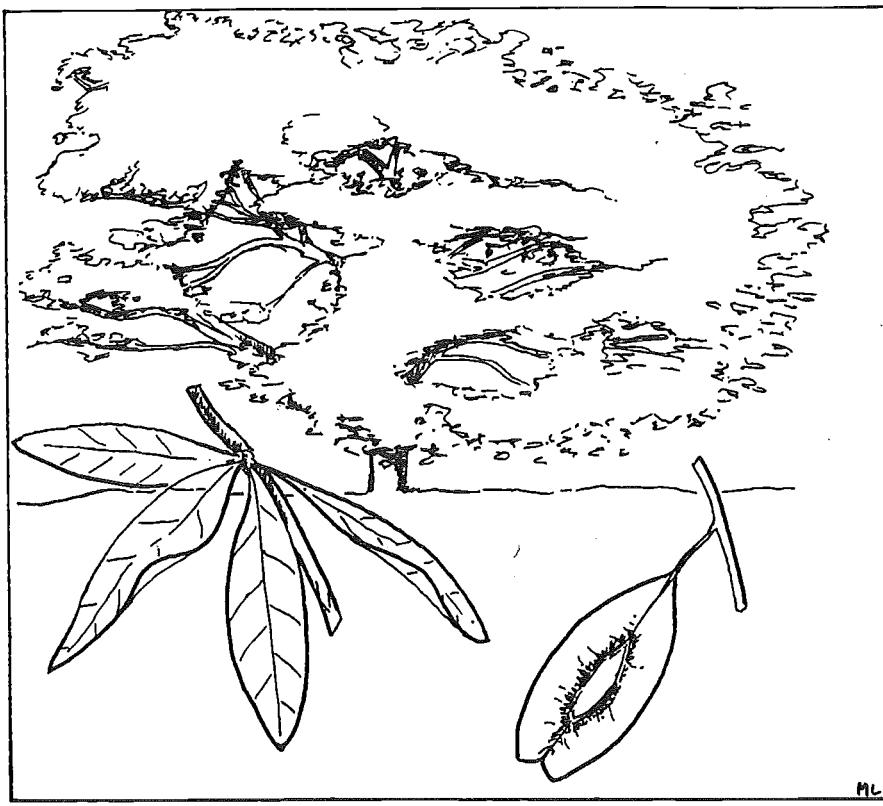
IMPORTANT USES

Use #1 : **MEDICINE**
Both the leaves and roots are used in local medicine. The roots are used to treat colds and chest problems.

Use #2 : GENERAL PURPOSE WOOD
The wood is moderately hard, tough, and pale and is used for walking sticks, tool handles, bowls, clubs, spear shafts, poles, and hoe pins.

Use #3 : LAND IMPROVEMENT
Farmers consider *T. nobilis* useful for soil and water conservation.

TERMINALIA SERICEA



DISTRIBUTION

T. sericea is scattered in open woodlands, or as a dominant or co-dominant in mixed deciduous forests. It thrives in a range of soil types, moisture conditions, and drainage conditions as long as light is not a limiting factor (Pohjonen 1992). It seldom makes pure stands in late successional stages. *T. sericea* is common as a shrub or bush of 6 to 9 m, but individual trees may reach 23 m in height. It thrives in deep sandy soil with moderate rainfall (Palgrave 1988).

REQUIREMENTS

Light Requirements : Demanding.

Influential Factors : It is adaptable to drought and moderately adaptable to saline soils. It can tolerate some frost. *T. sericea* is reported to form dense thickets when cut or burnt, and becomes weedy, preventing the growth of grass (Palmer and Pitman, 1972).

PROPAGATION

Means of Propagation : Seed. It naturally regenerates readily.

Seed Treatments : Fruits are oval, winged, are soft pink when mature, and contain 1 seed per fruit. The pink colour darkens with age. Fruits are sometimes parasitized and become deformed, twisted, and hairy.

Seedling Management : *T. sericea* seeds and regenerates readily as open sites become available (Pohjonen 1992).

SILVICULTURE

Planting Types : Recommended for reforestation, agroforestry, and land improvement.

Growth Factors : *T. sericea* is a promising tree in Dodoma.

Growth Cycle : In the later stages of succession it is found as an individual tree.

Management Systems : An easily established aggressive species. Since *T. sericea* shades out weeds and climax species are allowed to establish themselves.

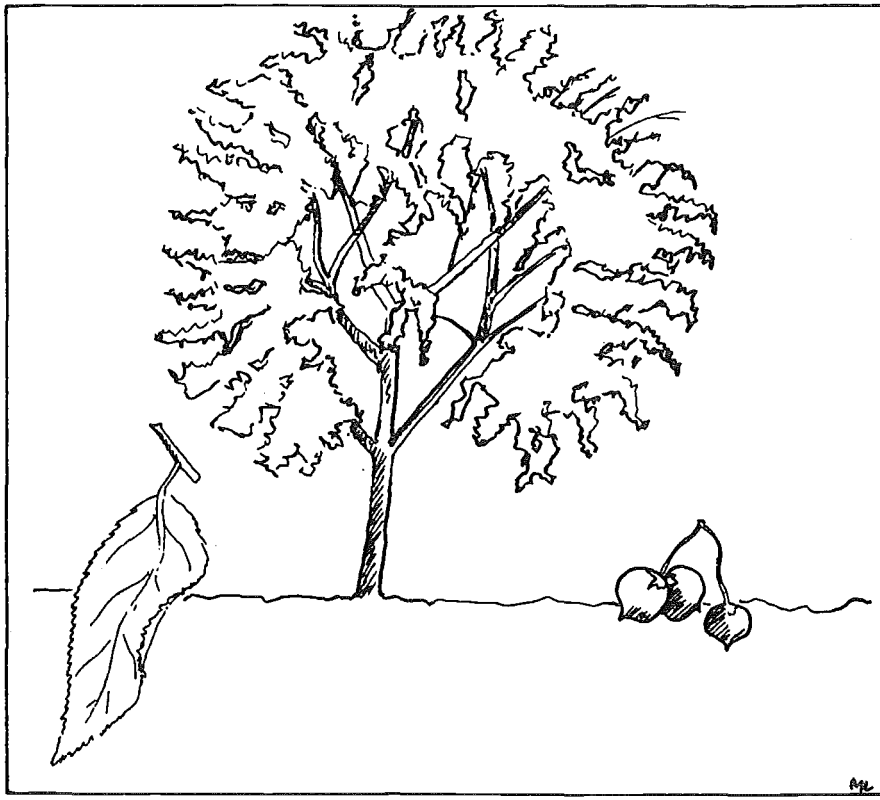
IMPORTANT USES

Use #1 : LAND IMPROVEMENT
The tree improves sites by draining waterlogged soils, shading out weeds, and enriching impoverished soils. It is also used for erosion control.

Use #2 : MEDICINE
The roots are used to treat bilharzia, colic, pneumonia, and diarrhoea. The leaves are used for stomach disorders. A glucoside, nerifolin, has been isolated and found to have an effect on the heart (Palgrave 1988). The tree may be poisonous (Westman Draft).

Use #3 : GENERAL PURPOSE WOOD
The wood is yellow, hard, heavy, very tough, and resistant to both termites and borers. It is used extensively for fence posts and tool handles. *T. sericea* is known to make good charcoal and is also used for construction, furniture, and firewood. The bark is cut into strips and is used as a rope to tie frames together and to hang beehives.

TREMA ORIENTALIS*



DISTRIBUTION

T. orientalis is widely distributed through a range of altitudes in higher rainfall areas. It is common along the margins of lowland and upland forests, extending into riverine forests and forest gaps. *T. orientalis* is a pioneer species and is found in clearings and on abandoned farmland (FAO 1986). It is found throughout Tanzania on suitable sites, including the Coast, Dodoma, and Tabora.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2100
Minimum Rainfall (mm) :	1000
Minimum Temperature (C) :	16

REQUIREMENTS

Soil Requirements : Prefers sites on well-drained, exposed soils without leaf litter, demonstrating an ability to become established on poor or disturbed soil (Forest Division 1984).

Influential Factors : It quickly invades clearings and disturbed soil.

PROPAGATION

Means of Propagation : Seed, cuttings, or by coppice.

Seeds per kg :	370000
Germination Rate (%) :	75
Germination Length :	10-30 days
Seed Sources : 1800 TSH per kg - Silviculture Research Centre 1991/92.	

Seed Treatments : Fruits are small and round, turning black when mature, about 3 to 5 mm in diameter. Collect ripe fruits directly from healthy trees. Seed may be air dried and stored for up to 6 months, but may also be planted immediately. No pretreatment is required (RSCU 1992). Germination occurs within 10 to 30 days, with 70 to 80% of the seeds germinating. Full light encourages germination. Seedlings show rapid growth in a nursery, and will reach 1 m within 6 weeks of germination. Seedlings may be outplanted after 3 months in the nursery (Forest Division 1984).

Seedling Management : Reported to germinate easily from seed. Full light encourages germination.

SILVICULTURE

Planting Types : Recommended for planting in lower and wetter parts of the highland zone. It could be used as a shade plant for coffee or cardamom or for the rehabilitation of poor sites (Forest Division 1984). It does not compete with crops.

Growth Factors : Very fast growing (RSCU 1992). The fastest growth occurs in warm, moist areas with consistent temperatures.

Growth Cycle : Flowers throughout the year. It generally lives only 8 to 10 years (Forest Division 1984).

Limitations to Planting : Short lifespan.

Management Systems : Foliage is browsed by livestock and wild animals. Cultivated trees require protection. The tree has the ability to coppice readily.

IMPORTANT USES

Use #1 : MEDICINE
The leaves are used to treat coughs and sore throats and the bark is used to make a cough syrup. Other reported uses include remedies for asthma, bronchitis, gonorrhoea, malaria, yellow fever, toothaches, and intestinal worms (Rulangaranga 1989). The tree also contains sapiens, condensed tannins, and other chemical constituents important for pharmaceuticals (FAO 1986). It is used as an insect repellant and an antidote to general poisoning.

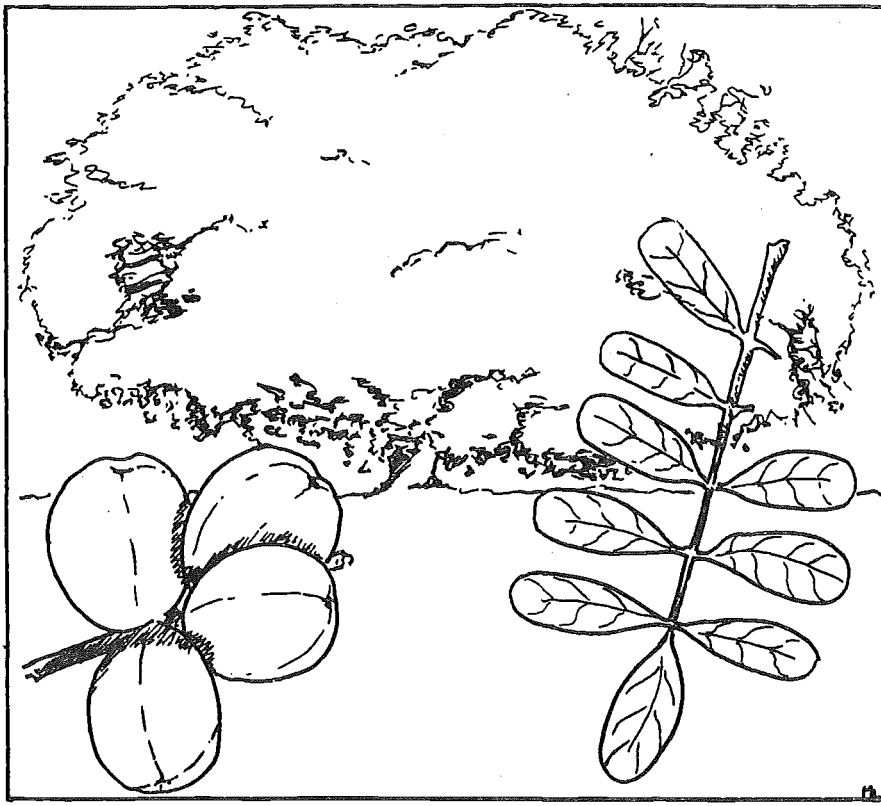
Use #2 : LAND IMPROVEMENT
T. orientalis is nitrogen fixing and considered to have immediate potential for the rehabilitation of poor exposed soils. The leaves can also provide mulch and the tree can be used for shade without affecting crops.

Use #3 : FODDER
The leaves, pods, and seeds are used as fodder.

NOTES

It is a host tree for butterflies. The fruit attracts birds; bees are attracted to the flowers. The timber is considered to be poor and of only fair quality, but the wood is used for firewood, charcoal, poles, and posts.

TRICHILIA EMETICA



DISTRIBUTION

A widely distributed tree of the high forest, in areas with moderate to high mean temperatures at lower elevations (FAO 1986). It is more abundant in open riverine-alluvial lowland rainforests and open savannah woodlands, generally near rivers. *T. emetica* is found in Kigoma, Mbeya, Tabora, Morogoro, Dodoma, Iringa, and Tanga.

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2100
Minimum Rainfall (mm) :	1000
Maximum Rainfall (mm) :	2350
Minimum Temperature (C) :	16
Maximum Temperature (C) :	25

REQUIREMENTS

Soil Requirements : Alluvial soils recommended (FAO 1986). It prefers well-drained, rich soil with high ground water (RSCU 1992).

Influential Factors : If rainfall is lacking it must be near to ground water sources or a river. *T. emetica* is normally immune to termites.

PROPAGATION

Means of Propagation : Seed, transplants, cuttings, and root suckers. Regenerates naturally by seed, root suckers, and coppice, but only under seed trees.

Seeds per kg :	1950
Germination Length :	15-23 days
Seed Sources : 2000 TSH per kg - Tanzania National Seed Centre 1991.	

Seed Treatments : The small fruits are about 1.9 cm in diameter, turning crimson when mature. The fruit has 3 or 4 lobes, each containing 1 or 2 bean-like black and red seeds. Collect seed from capsules that are opening on the tree. Place in water, and discard any floating seed, which will not germinate. Seeds have a short period of viability, and should be sown within 3 days of collection. No pretreatment is needed. Seedlings may be outplanted after 6 to 8 months (Forest Division 1984).

Seedling Management : Owing to loss of seed viability, sow fresh seeds. Seeds are extremely poisonous (RSCU 1992). Cuttings are susceptible to termites and seeds are often attacked by a weevil borer (Watkins 1960).

SILVICULTURE

Planting Types : The species is recommended for planting in the coastal and interior lowland zones as an ornamental or shade tree for which it is well-known. *T. emetica* is sometimes planted in reforestation projects and has potential for agroforestry (Forest Division 1984).

Growth Factors : The tree is fairly fast growing.

Growth Cycle : Rotation length is 60 to 80 years (Watkins 1960). The tree flowers from August to October, and fruits mature from February through April (FAO 1986). Seed production tends to be irregular from year to year.

Management Systems : Palmer and Pitman note that young trees grow up in the deep shade of parent trees and are generally found in small groups of various sized individuals (Palmer and Pitman 1972). In pure stands, spacing should be 3x3 m triangular spacing for fruit production or 6x6 m in combination with agricultural crops. Outplanted seedlings require some shade, and 30 trees per ha of the original vegetation should be left standing to provide shade. Seedlings can be transplanted from the nursery after 6 to 8 months. Seedlings are sensitive to weed competition. Removing herbaceous material from the site before planting, and continuous weeding is required for the first few years after planting (Forest Division 1984). The tree coppices well.

IMPORTANT USES

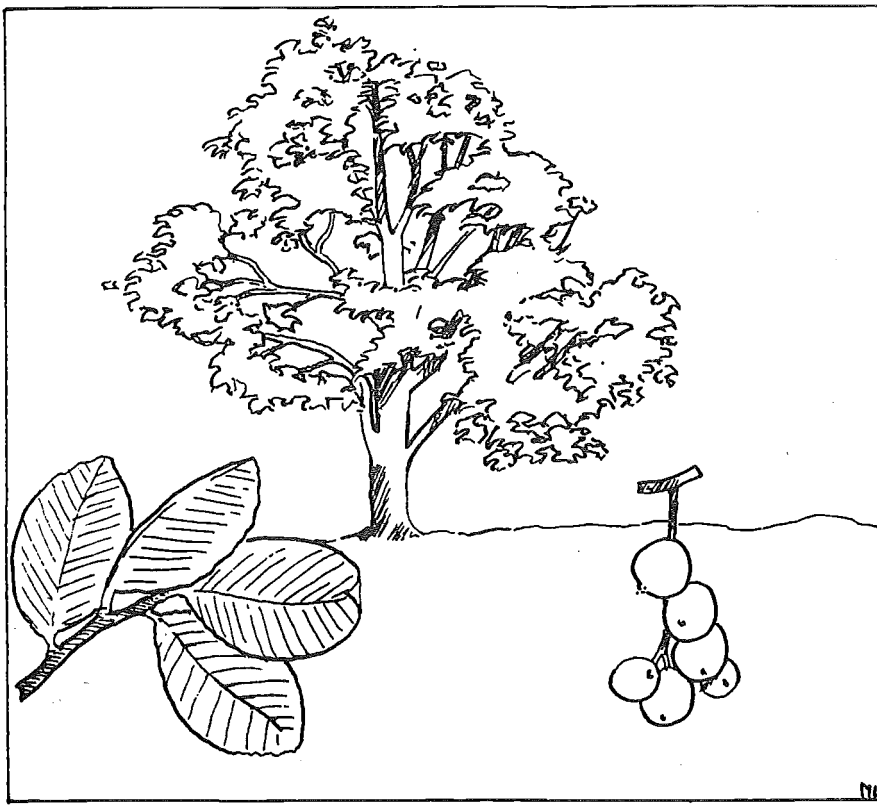
Use #1 : SOAP
Seeds produce an oil that is used in the production of soap. The oil has been an export product in the past.

Use #2 : MEDICINE
The bark is a remedy for pneumonia, and the roots are used to treat colds and as a purgative. The seed oil is applied to sores, ringworms, other parasites, and skin diseases. The root is also used to induce labour in pregnant women (FAO 1986).

Use #3 : GENERAL PURPOSE WOOD
The wood is suitable for indoor uses, and is used to make furniture, poles, and as timber. The wood is sometimes treated. It is also used for firewood.

OTHER USES : *T. emetica* is an excellent shade tree and has been planted as windbreaks and for water catchment rehabilitation.

UAPACA KIRKIANA*



DISTRIBUTION

The tree is found in lowland forest, secondary Miombo woodland such as clearings and gaps, open woodland, and amongst rocks at medium altitudes with good rainfall. *U. kirkiana* occurs in Geita, Njombe, Ruvuma, Tabora, Mbeya, and Iringa (FAO 1986).

Minimum Altitude (m) :	800
Maximum Altitude (m) :	1900
Minimum Rainfall (mm) :	500
Maximum Rainfall (mm) :	1270

REQUIREMENTS

Soil Requirements : Tolerates poor, shallow soils, gravel, and sandy loam soils.

Influential Factors : It is always found on poor and shallow soils (RSCU 1992).

PROPAGATION

Means of Propagation : Seed, cuttings, wildlings, root suckers, and coppice. Natural regeneration may be the most reliable method.

Seed Treatments : Pretreatment is not necessary. Seed does not store well.

Seedling Management : Seed does not remain viable long so it must be sown fresh. Germination is good and natural regeneration is adequate.

SILVICULTURE

Planting Types : Used in agroforestry, around home compounds, and boundaries especially in Miombo woodlands. It is left standing on cleared land.

Growth Factors : Fairly fast growing.

Growth Cycle : *U. kirkiana* flowers and fruits during the rainy season, and fruits ripen from September through December (FAO 1986). Fruits are edible from October through February.

Management Systems : The tree has coppicing ability. Natural regeneration is reliable but protection of wildlings is important.

IMPORTANT USES

Use #1 : FRUIT
U. kirkiana is highly regarded for its fruit. Trees are generally retained for the fruit, which are eaten by children and adults, and used to make a sweet beer sold in the market in Ruvuma. It is an important famine food in the drier areas of Tanzania. It is often prepared as a sweetmeat or jam, especially in neighbouring countries. There is considerable potential for domestication of this species considering its popularity with farmers.

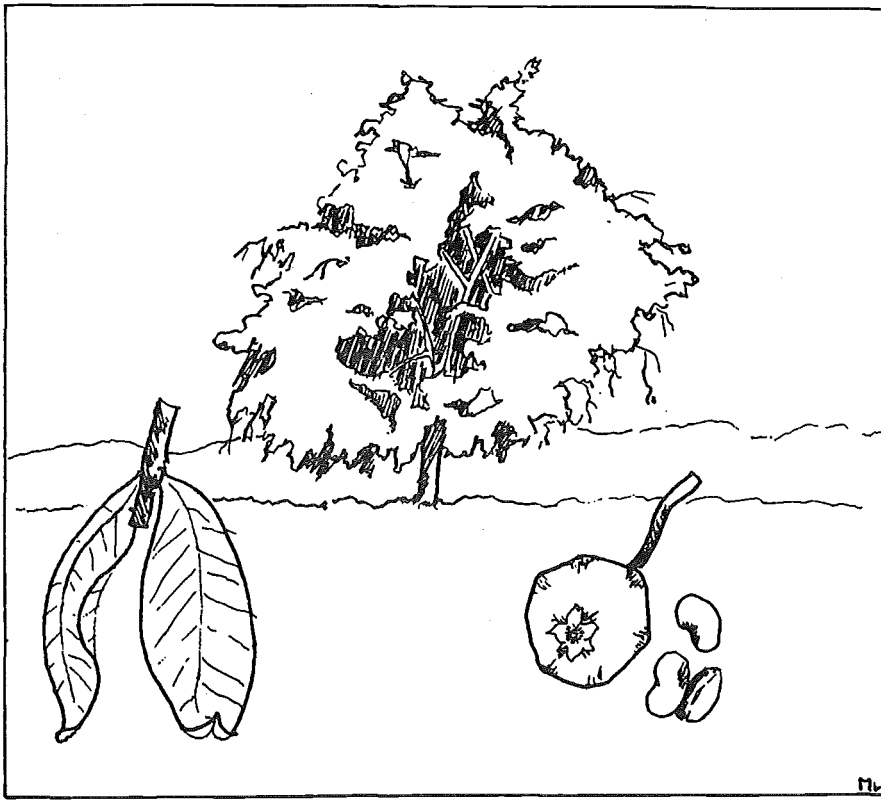
Use #2 : MEDICINE
The root is used to treat indigestion.

Use #3 : FUELWOOD
Charcoal from this tree is highly regarded and many trees are cut for this purpose. It is also used for firewood in areas where the demand for charcoal is low.

OTHER USES : Flowers are valuable for honey production.

The wood is fairly durable, straight-grained with white sap wood and red-brown figured heartwood. It is termite resistant. It is used to make furniture, for domestic uses such as spoons, and as timber.

VANGUERIA MADAGASCARIENSIS



DISTRIBUTION

The tree is widespread in Tanzania in riverine lowland forests and *Brachystegia-Combretum* woodlands. It is more abundant in open, cleared areas than in closed forests. It is able to tolerate a wide variety of sites, including woodlands, bush, scrub, stony outcrops, and dunes. *V. madagascariensis* is found in Kilimanjaro, Arusha, Dodoma, Singida, and Tabora (FAO 1983).

Minimum Altitude (m) :	600
Maximum Altitude (m) :	2050
Minimum Rainfall (mm) :	600
Maximum Rainfall (mm) :	2500
Minimum Temperature (C) :	17
Maximum Temperature (C) :	29

REQUIREMENTS

Soil Requirements : Tolerates volcanic ash soils; light yellowish-brown to reddish-yellow, gritty, sandy clay loams; red to dark red, friable clays with laterite and yellow-red loamy sands (FAO 1983).

Light Requirements : Demanding.

Influential Factors : Not resistant to fires.

PROPAGATION

Means of Propagation : Regenerates naturally by seed and coppice, and may be grown in a nursery.

Seed Treatments : Fruits are round, up to 4 cm in diameter and contain 3 seeds. It is necessary to break dormancy by scarifying the hard seed coat.

Seedling Management : The longer seed stays on the ground in natural conditions, the softer the coat becomes, thus facilitating germination.

SILVICULTURE

Planting Types : Tree is retained and semicultivated on farms. It is grown along boundaries and home compounds.

Growth Cycle : Flowering occurs in October through February. Fruit ripens in Dodoma, Singida, Tabora from April through July, and August through December in Kilimanjaro and Arusha (FAO 1983).

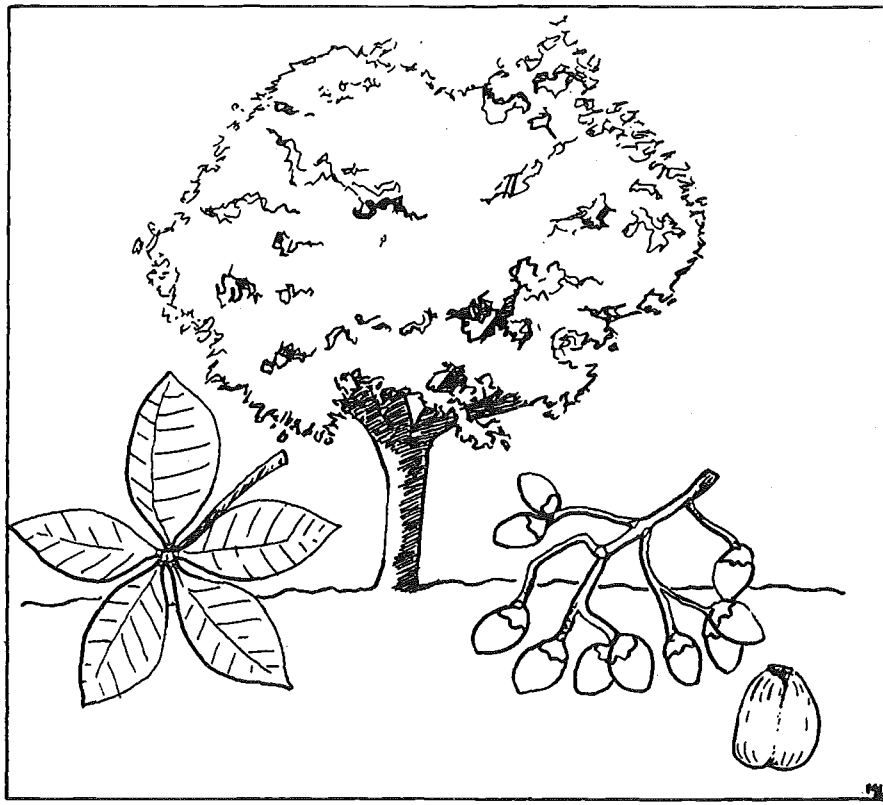
Management Systems : Crop refining in natural open areas, and protection from late forest fires could promote regeneration and growth. Since it is a light demander, the site should be cleared of most vegetation. Weeding is important until the trees are established.

IMPORTANT USES

Use #1 : FRUIT
Fruits are edible and sold in markets. Farmers retain this species for the fruit.

Use #2 : GENERAL PURPOSE WOOD
It is used in building construction and for firewood.

VITEX DONIANA*



DISTRIBUTION

A widespread deciduous forest tree largely found in coastal woodlands and savannah, but also in wetter areas at lower altitudes and on Zanzibar and Pemba islands. It is found in deciduous woodlands (especially *Brachystegia*), secondary forests, and dry forests. It is not found in montane rainforests and the Dodoma thicket belt (FAO 1983).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	1800
Minimum Rainfall (mm) :	700
Maximum Rainfall (mm) :	2000
Minimum Temperature (C) :	10
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Found on fields, fallows, and on alluvial soils (Von Maydell 1986).

Influential Factors : Requires a high water table.

PROPAGATION

Means of Propagation : Propagation methods include wildlings, seed, coppice, and root suckers.

Seeds per kg :	1000

Seed Treatments : Fruit is oblong, about 3 cm long, turning black when mature. Remove seeds from fleshy pulp and soak them overnight in lukewarm water. The hard seed coat needs to be broken. Dry the seeds before planting in pots (3 seeds per pot). Outplant in an area with good access to water.

Seedling Management : Trees regenerate naturally by seed and root suckers. Seeds need a very long time to germinate (Von Maydell 1986). Germination is most successful with fresh seeds. Forest fires may help break the seed coat before germination (RSCU 1992).

SILVICULTURE

Planting Types : Grown in fields and along boundaries. It is occasionally planted around home compounds (Von Maydell 1986).

Growth Factors : Has a moderate growth rate.

Growth Cycle : Flowers from August through November, and fruits from January to April (FAO 1983).

Management Systems : Natural regeneration occurs by seeds, coppice, and root suckers.

IMPORTANT USES

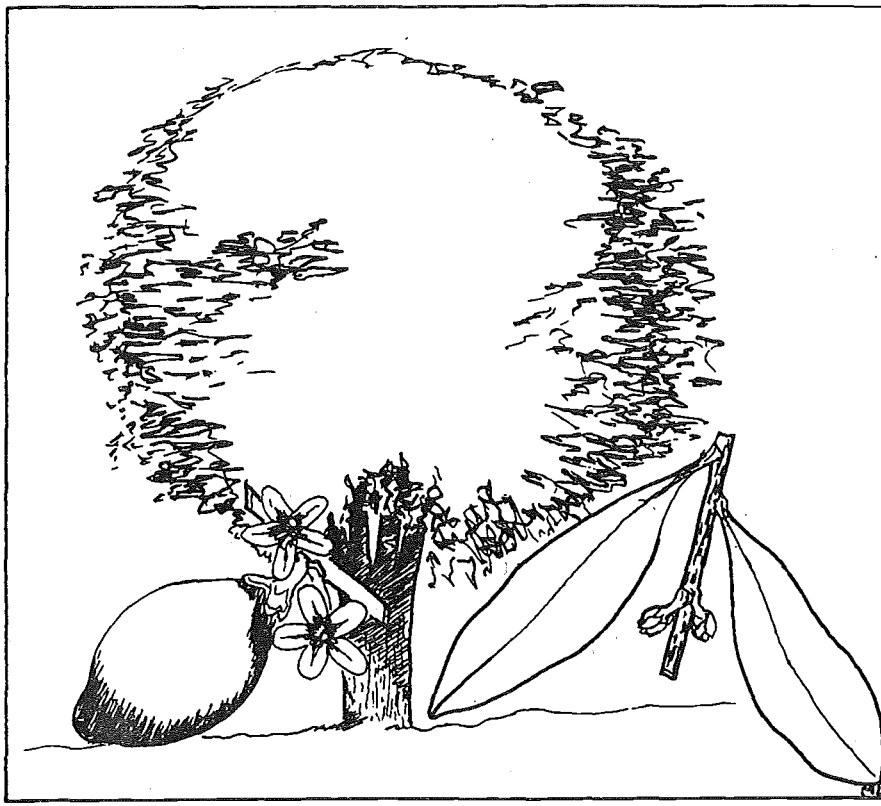
Use #1 : FRUIT
The edible fruit is sweet, tastes like prunes, and is occasionally sold.

Use #2 : MEDICINE
There are numerous medicinal uses for this tree. *V. doniana* is used to treat anemia and the root is used for gonorrhoea (FAO 1983). It is also supposed to improve fertility and is used to treat jaundice, leprosy, and dysentery (Von Maydell 1986).

Use #3 : LAND IMPROVEMENT
V. doniana is nitrogen fixing and its leaves are used for mulch.

OTHER USES : The tree produces a teak-like termite resistant timber (RSCU 1992). Von Maydell (1986) reports that the wood is intensely attacked by insects. It is medium hard and suitable for light building material, furniture, carvings, and boats. It is also used for firewood and charcoal. The leaves, pods, and seeds are good fodder.

WARBURGIA SALUTARIS



DISTRIBUTION

This spreading evergreen is widely distributed in lower rainforests, drier highland forest areas, and in secondary bushlands and grasslands (Dale and Greenway 1961). It is common in Babati district. It is found in Arusha, Tanga, Mwanza, Shinyanga, Dodoma, Kigoma, Tabora, Rukwa, Mbeya, Morogoro, and Iringa (Rulangaranga 1989).

Status : May be threatened because of the high demand for its medicinal bark.

Minimum Altitude (m) :	1000
Maximum Altitude (m) :	2000

PROPAGATION

Means of Propagation : Can be propagated by seed (direct sowing and seedlings), cuttings, and wildlings.

Seeds per kg :	10500
Germination Rate (%) :	80

Seed Treatments : Fruits are oval berries 4 cm in diameter, turning dark purple when ripe. Wash the fruit and sow fresh seeds promptly as they lose viability quickly when stored.

Seedling Management : Regeneration is primarily from seed and germination rates are good. The seeds are hard to collect, but can

be obtained in Kenya (Teel 1984). The tree is known to reproduce from cuttings.

SILVICULTURE

Planting Types : Grown as single trees and along boundaries.

Growth Factors : *W. salutaris* is fairly slow growing.

Growth Cycle : Flowers at the beginning of the rains and fruits form late in the rainy season. The fruits may remain on the tree for a long time (FAO 1986).

Management Systems : The tree has coppicing ability.

IMPORTANT USES

Use #1 : MEDICINE
The medicinal properties of this species have been known for a long time and it is still highly regarded for its medicinal uses. The bark is sold in most major markets in Tanzania and demand appears to be high. The inner bark has many uses as a treatment for malaria, colds, chest pains, coughs, diarrhoea, muscle pains, stomach aches, and general body pains (Rulangaranga 1989).

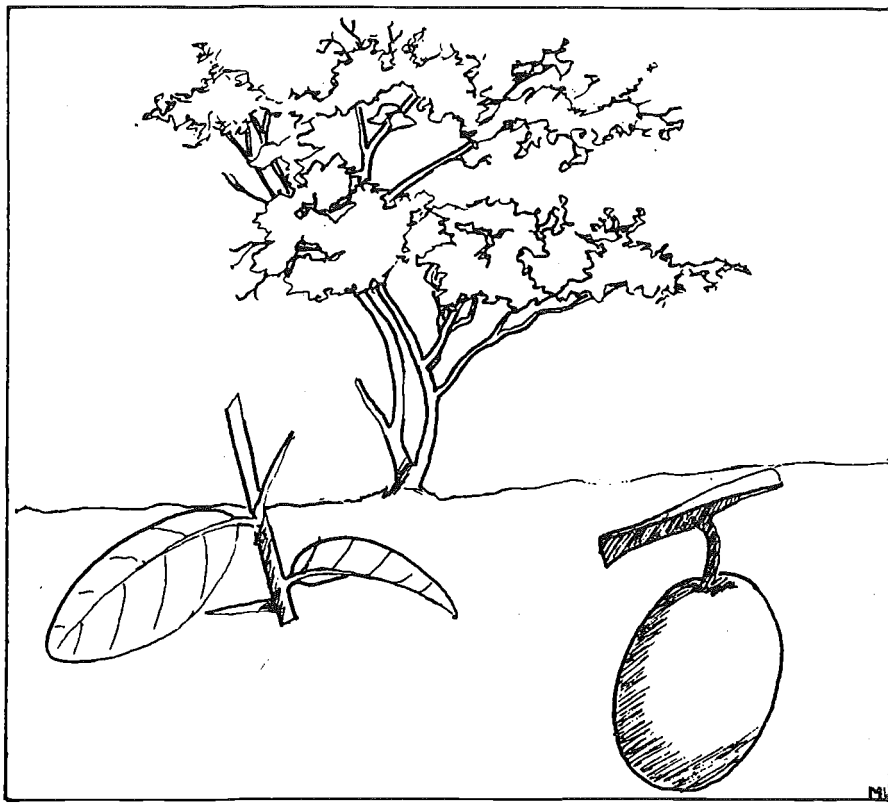
Use #2 : LAND IMPROVEMENT
It is nitrogen fixing and can be used for green manure and mulch. It also provides good shade.

Use #3 : FODDER
The leaves, pods, and seeds all provide good fodder.

OTHER USES : The heartwood is oily, aromatic, and pale, and darkens with exposure to air. It saws and polishes well but is not durable (Palgrave 1988). It is used as firewood and occasionally as timber.

In many places the leaves are used to flavour soups and curries.

XIMENIA AMERICANA



DISTRIBUTION

A mostly solitary tree dispersed in open country, savannahs, gallery forests, along coastal areas, in the understorey of dry forests, in dry woodlands, or on riverbanks. In Tanzania it is more abundant in bushland and semiarid zones. *X. americana* is found in Arusha, Tabora, Dodoma, Morogoro, Coast, and Iringa (FAO 1983).

Minimum Altitude (m) :	0
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	300
Maximum Rainfall (mm) :	1250
Minimum Temperature (C) :	14
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Found on many kinds of soils, often poor and dry, including clays, clay loams, loamy sands, sandy clay loams and sands (FAO 1986).

Influential Factors : The tree is drought resistant (RSCU 1992).

PROPAGATION

Means of Propagation : Propagated from seed and cuttings. Vegetative propagation is probably possible (Von Maydell 1986). The tree regenerates naturally from seed and coppice.

Seeds per kg :	1400

Seed Treatments : Oval fruits are about 3 cm long and contain 1 seed each. Fruits are yellow or red, thin skinned, and plum-like and must be picked from the tree as they perish quickly. Pretreatment of the seed is not necessary. Fresh seed should be sown for good germination. The seed can be stored for long periods.

Seedling Management : There is little experience with raising seedlings and outplanting them, but it appears highly possible. Germination is satisfactory.

SILVICULTURE

Planting Types : *X. americana* is useful in arid and semiarid areas.

Growth Cycle : On good sites trees produce fruit in and after year 3. It flowers and fruits throughout the year, independent of climatic regimes (FAO 1983). Seeds are collected in July and August at the coast (RSCU 1992).

Limitations to Planting : Seedlings appear to be susceptible to drought and fire.

Management Systems : Regeneration in natural forests is very sparse, so partial protection of its natural habitat could promote natural regeneration.

IMPORTANT USES

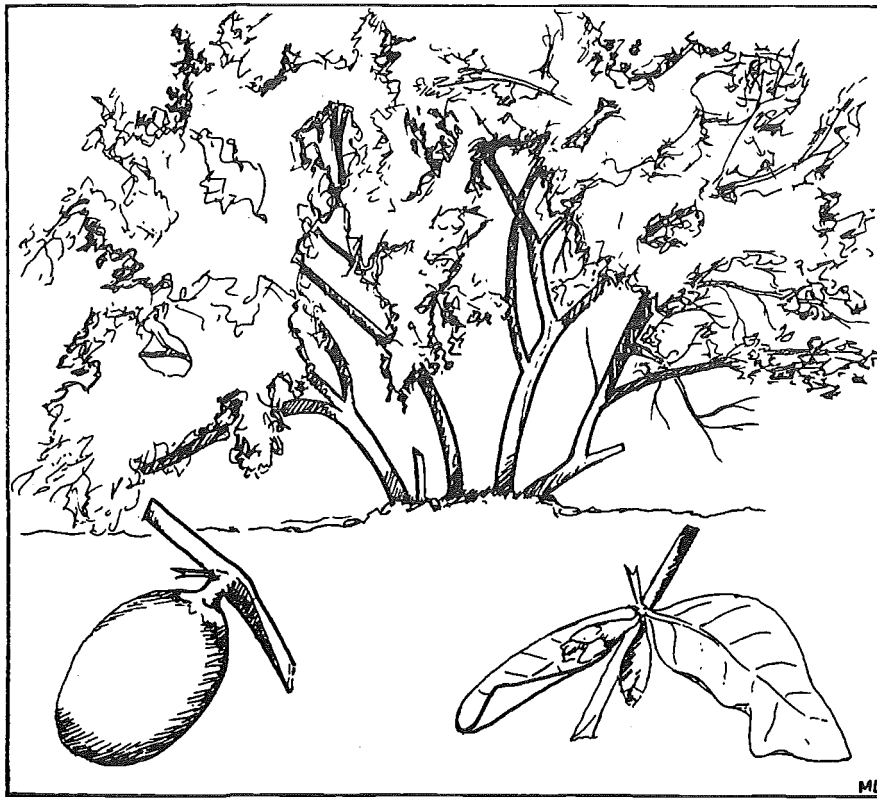
Use #1 : FRUIT
The fruit is thirst quenching. It is used as a drink and in making jams and jellies. It was reported that the Sandawe rely on the fruit as a staple.

Use #2 : MEDICINE
The bark, fruit, and leaves have many uses in local medicine for people and animals. Leaves and twigs are used for fever, colds, and as a laxative and eye lotion. Leaves are used for headaches (especially in children), angina, and as a poison antidote. Roots are used for skin problems, headaches, venereal disease, sleeping sickness, oedema, and as a poison antidote.

The fruit is useful in habitual constipation and the bark is used for febrile headaches, in bath water for sick children, for kidney and heart complaints, and can be applied to skin ulcers. A decoction of roots or fruits is used to treat dysentery in calves.

Use #3 : FIREWOOD
Firewood is the principle use of the wood, mainly because the trunk is rather small. The wood is very hard and dense (0.89 to 0.91 gr per cm^3) (FAO 1986).

XIMENIA CAFFRA*



DISTRIBUTION

The tree is widespread throughout Tanzania in dry wooded bushland and wooded grassland, but is more abundant in coastal and lowland dry woodland. It is found in Arusha, Iringa, Tanga, Tabora, Dodoma, Morogoro, and Coast regions (FAO 1983)

Minimum Altitude (m) :	15
Maximum Altitude (m) :	2000
Minimum Rainfall (mm) :	250
Maximum Rainfall (mm) :	1270
Minimum Temperature (C) :	14
Maximum Temperature (C) :	30

REQUIREMENTS

Soil Requirements : Prefers clay loams, clays, compacted loamy sand, sandy clay loams, and friable clays with laterite horizon (FAO 1983).

PROPAGATION

Means of Propagation : Regenerates naturally by seed, coppice, and root suckers. Nursery seedlings are a good possibility.

Seed Treatments : The oval fruits are about 3 cm long and contain 1 seed each. Fruits are orange or red when ripe. It is possible that seeds need no treatment.

Seedling Management : *X. caffra* has good seed germination capacity and profuse natural regeneration, but saplings may succumb to prolonged drought or forest fires.

SILVICULTURE

Growth Cycle : Flowers in the dry season towards the onset of the rains. The fruit ripens during the rains.

Management Systems : Partial protection of natural woodland could help promote regeneration.

IMPORTANT USES

Use #1 : FRUIT
The ripe fruit pulp is edible, though bitter.

Use #2 : OIL
The seed yields a viscous, non-drying oil that has many applications. It is used to soften animal hides, bow strings, and for a general body ointment.

Use #3 : GENERAL PURPOSE WOOD
Wood is hard and fine-grained. It is used to make tool handles, spoons and in general construction. It is also used as firewood.

OTHER USES : The roots are used to treat abscess, severe stomach aches, or colic, and against malaria and bilharzia. The tree is also used for syphilis, hookworm, and chest pains (Hedberg 1983). The roots are pounded and boiled with maize flour for porridge which is eaten to prevent sterility in women.

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Appendix B: Questionnaires

No. 1: Species Data Questionnaire

No. 2: Village Level Questionnaire

No. 3 Market Survey

No. 4 Seasonal Calendar for Harvesting/Collecting Products

No. 1: Species Data Questionnaire

-1-

One questionnaire should be filled out for each species that meets one of the following criteria:

- indigenous species currently used by local people,
- species which have a minimum of three currently used products (end uses),
- indigenous species which are highly valued by local people or are threatened,
- species for which the end uses have no substitute,
- local species that have the potential for more intense cultivation.

Town/Village: ..... Region: .....

LATIN NAME: .....

Common name(s): .....

Local name(s): .....

1. SPECIES STATUS Indigenous Yes / No Introduced Yes / No Date: .....

2. DISTRIBUTION Locally Distributed / Widespread / Endangered / Threatened

3. DENDROLOGY Striking Characteristics: .....

.....

4. TECHNICAL FEASIBILITY

Site Requirements:

Rainfall: .....mm/year over ..... months .....

Temperature: from ..... to .....

Soils: .....

Light: Demanding / Tolerant / Shade

Influential Factors: .....

.....
(slope, aspect...)

Currently Planted: Yes / No If Yes: .....

Type of Planting: Block Planting / Agroforestry / Homestead Planting / Strip Plantations/

Production Forestry / Community Forestry / Others (.....)

Indicate Spacing if Applicable: .....

Has Management System Been Developed ? Yes / No Describe:

. . . . . .

Establishment/Growth Success Indicators: (give range) . . . . . .

Growth (MAI): . . . . . m3/ha/yr . . . . . .

Survival Rate: . . . . . %

Resistance to Pest/Disease (specify): . . . . . .

. . . . . .

Resistance to Drought: Yes / No Consecutive Months: . . . . . .

Resistance to Fire: Yes / No

Influential Growth Factors: . . . . . .

. . . . . .

Limitations to Planting (identify constraints): . . . . . .

. . . . . .

Propagation

Means of Propagation: Seeds / Cuttings / Stumps / Grafting / Other . . . . . .

Seeds Available: Yes / No

Origin: Imported: . . . . . .

Local Collection: . . . . . .

Local Sources: . . . . . .

Varieties: (HVY) . . . . . Seeds / kg: . . . . . .

Others . . . . . .

Germination Rate: . . . . . % Germination Period: . . . . . .

Seed Treatment: . . . . . .

Seedling Raising Constraints: . . . . . .

. . . . . .

5. ECONOMIC USES OF SPECIES

Range of Uses for Species:

. . . . . .

. . . . . .

For the Principal Uses Indicate:

USE #1 : . . . . . .

Product is: self-consumed / traded locally / traded nationally / traded internationally

Market prices (values) are defined: well / partially / not at all / locally / nationally

Marketing/distribution systems are: non-existent / partially developed / well-developed
If well-developed, describe:

. . . . . .

Is value added to products ? yes / no Processing type: family / artisan / industry
Explain:

. . . . . .

Preservation/conservation: raw / processed - Indicate techniques used:

. . . . . .

Substitutes for product: do not exist / exist (specify):

. . . . . .

Importance of product in day-to-day life (frequency of use, dependency on product):

. . . . . .

Constraints to expanding uses of species (if species has multiple uses, which uses are not developed and why ?):

. . . . . .

USE #2 : . . . . . .

Product is: self-consumed / traded locally / traded nationally / traded internationally

Market prices (values) are defined: well / partially / not at all / locally / nationally

Marketing/distribution systems are: non-existent / partially developed / well-developed

If well-developed, describe:

. . . . . .

Is value added to products ? yes / no Processing type: family / artisan / industry
Explain:

. . . . . .

Preservation/conservation: raw / processed - Indicate techniques used:

. . . . . .

Substitutes for product: do not exist / exist (specify):

. . . . . .

Importance of product in day-to-day life (frequency of use, dependency on product):

. . . . . .

Constraints to expanding uses of species (if species has multiple uses, which uses are not developed and why ?):

. . . . . .

USE #3 : . . . . . .

Product is: self-consumed / traded locally / traded nationally / traded internationally

Market prices (values) are defined: well / partially / not at all / locally / nationally

Marketing/distribution systems are: non-existent / partially developed / well-developed
If well-developed, describe:

. . . . . .

Is value added to products ? Yes / No Processing type: family / artisan / industry
Explain:

. . . . . .

Preservation/conservation: raw / processed - Indicate techniques used:

. . . . . .

Substitutes for product: do not exist / exist (specify):

. . . . . .

Importance of product in day-to-day life (frequency of use, dependency on product):

. . . . . .

Constraints to expanding uses of species (if species has multiple uses, which uses are not developed and why ?):

. . . . . .

NOTES AND OBSERVATIONS

No. 2: Village Level Questionnaire

INSTRUCTIONS FOR USING VILLAGE QUESTIONNAIRE

Please begin each interview by asking the person if you may discuss tree species of local importance and of importance to their family. Explain that the information is for a study and that their responses will only be used for research purposes and that they should feel free to speak openly. Inform the respondents that you have approximately 20 specific questions you would like to ask, but that they should feel free to elaborate on any point that they would like. Explain what the purpose of the study is and how their responses will be used. Thank them for their willingness to help and for their time.

1. Try to get a general understanding of the village dynamics before beginning each interview. This can be achieved by speaking with a small (or large if it seems appropriate) group to determine how certain activities, words, and concepts are defined by a particular village.

   A minimum of 5 individuals should be interviewed in each village. This sample should be half women, and of the ten at least half should be older people in the village who have a memory of village activities over the years.

2. When interviewing women try to ensure that they can talk freely and do not feel inhibited by the situation. In many cases it will be better to talk with women outside the presence of men.

3. When recording any numbers make sure you include the appropriate units. For example: TSH per kilogram; m3 per hectare per year, kilograms per month.

4. When recording names of tree species in the local language, verify the spelling, try to get any other names it might be called, and try to get a sample of the leaves if possible. Keep in mind that the local name must be matched with the Latin name.

5. Before leaving the village verify the responses of individuals in a group discussion that includes village elders, women, men and any local experts.

6. Try to stick to the topic of tree species and their uses, the value of certain products and species to families and specifically, which members of the family, which season these products are harvested in, the relative importance of these products compared to other products that are either produced or collected, and any information on quantities of products harvested. Please record any local stories, beliefs, etc. about the species mentioned.

7. Record precisely what part of the tree is used for a specific purpose.

   For example: with species X, leaves are used for fodder for goats, roots are ground into a powder and used as medicine for stomach problems, branches are used for fuelwood, and main stems for poles.

8. Try to develop a seasonal calendar with each village to determine what products are harvested at what time of year and for how many weeks or months the product is available. Record how many kilograms (or the appropriate units) are produced or collected during this time and whether the products are used to meet family needs or are sold.

No. 2: Village Level Questionnaire

-1-

.....

TRIBE .....

1. Town/Village: ..... Region: .....

2. Number of respondents: .... 3. Gender of respondents: .....

4. Where do trees and shrubs occur in the landscape ?

home compound / pastures / woodlots / forests / property boundaries / roads / water holes/ fallowland / cropland / riverbanks / other .....

5. What are the predominant species in the areas mentioned above ?

SPECIES	WHERE	SPECIES	WHERE
indigenous		fast growing	
.....		.....	
.....		.....	
.....		.....	

6. Has anyone in your household ever planted trees ? Yes / No

Where did you get the seedlings ? .....

7. Tree planting was done by: women / men / children / men and women / family

8. When were trees first planted ? year .....

9. Where were trees planted ? around house / around shamba boundary / in shamba / private plot / school tree project / church project / forest division project / other .....

10. What type of trees did you plant ?

1 ..... 2 .....

3 ..... 4 .....

5 ..... 6 .....

11. Why did you plant these species ?

1 .....

2 .....

3 .....

4 .....

5 .....

6 .....

12. Did your parents or grandparents plant trees when they were children ? Yes / No

What type of trees did they plant ?

....

....

SPECIES PREFERENCES AND USES

(For the next questions differentiate for men and women if mixed interview)

13. What are the highest priority uses (products/services) of local trees ?

use ..... species .....

use ..... species .....

use ..... species .....

use ..... species .....

use ..... species .....

14. What species do you prefer for:

	SEASON AND QUANTITY	WHO USES/CONTROLS PRODUCT	IS IT SELF CONSUMED/SOLD
fuelwood			
charcoal			
poles			
construction			
timber			
domestic uses/tools			
furniture			
medicines			
food			
drink			
fruit			

resins/gums .....

fodder .....

oils/dyes .....

land improvement .....

fencing .....

crafts .....

roots/thorns .....

honey .....

other .....

15. Which species are most important for meeting the family's daily needs. Are there readily available substitutes for these species ?

	SPECIES	RELATIVE IMPORTANCE	USES AND BY WHOM	LENGTH OF SEASON	AVAILABLE SUBSTITUTES
1					
2					
3					
4					
5					

16. Which products are now purchased that used to be self-produced ?

	SPECIES	PRODUCT
1		
2		
3		

17. Which species (indicate uses) are, or were important to your family but are now very difficult to find or have disappeared ?

.....

.....

18. Marketing of Tree Products

For all tree products that are sold for cash indicate who sells the product, major marketing channels (barter, direct sale in village, regional market, sale to local or outside traders, cooperatives, marketing boards, processing enterprises), form of marketed product and constraints to marketing.

PRODUCT/ SPECIES	SELLER	MARKETING CHANNEL/ PERSON WHO CONTROLS INCOME	PRICE(TSH/UNIT)/ FORM	QUANTITY/ SEASON	CONSTRAINTS
1					
2					
3					
4					
5					

19. Which local species are actively managed, preserved, planted or regenerated ? How is it organized ?

SPECIES	ACTIVITY
1	
2	
3	

20. Are seeds collected ?

SPECIES	FROM WHERE	END USE
1		
2		
3		

COMMENTS:

No. 3: Market Survey

.....

TRIBE .....

1. Town/Village: ..... Region: .....

2. Population: .....

3. Profession of respondent: ..... 4. Gender of respondent: .....

5. What tree products are sold for cash in the market ?

	PRODUCT	SPECIES	PRICE (TSH/UNIT)	SOLD	SEASON
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

6. For all tree products mentioned above indicate who sells product to market retailer and their gender, major marketing channels, form of marketed product and constraints to marketing.

	PRODUCT/ SPECIES	SELLER/ GENDER	MARKETING CHANNEL	FORM	CONSTRAINTS
1					
2					
3					
4					

5 .....

6 .....

7 .....

8 .....

9 .....

10 .....

11 .....

12 .....

7. What is the major mode of transportation for bringing goods to the market ?

.....

.....

8. Are there any legal or policy constraints which limit the supply of any of the above products ?

.....

.....

9. Are there any factors which affect the demand for any of the above mentioned products ?

.....

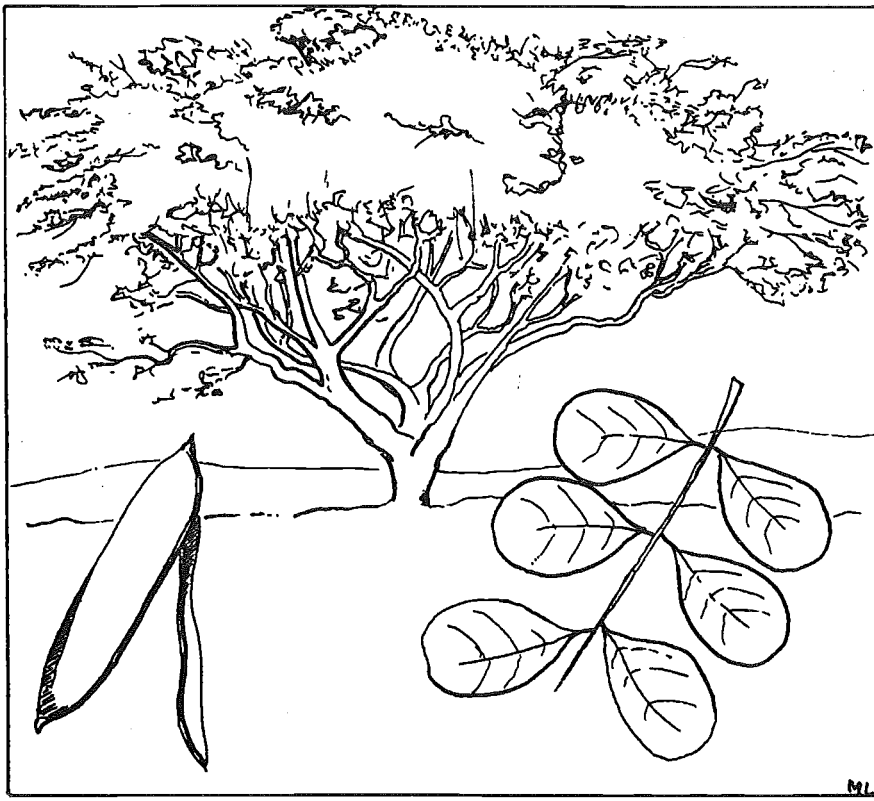
.....

Village Level Questionnaire

Seasonal Calendar for Harvesting/Collecting Forest Products

Indicate what products are harvested per season, the length of season, quantity harvested per season, and market price for product.

PRODUCT/SPECIES QUANTITY/PRICE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												



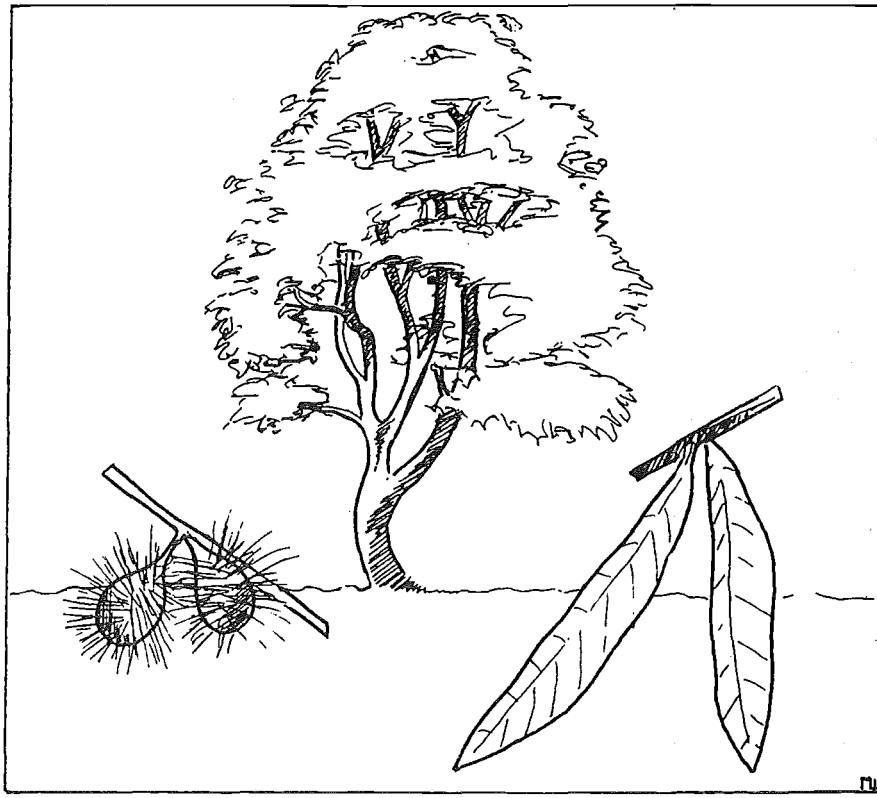
ALBIZIA PETERSIANA

Appendix C: Lexicon

C1 List of local languages

C2 Species list by Latin name

C3 Common and local names



C1 List of local languages

Local names for the identified tree species have been found in the following languages:

ARUSHA
BARBAIG
BENA
BENDE
BONDEI
BUNGU
CHAGGA
DIGO
ENGARUKE
FIOME
FIPA
FUFIJI
GOGO
GOROWA
GWENO
HA
HAYA
HEHE
IRAQW
ISANZU
JITA
KAGURU
KEREWE
KIMBU
KINGA
KINGURIMU
KISI
KONDE
KUKWE
KURIA
LONGO
LUGURU
MANG'ATI
MASAI
MATENGO
MATUMBI
MBUGWE
MBUNGA
MERU
MWERA
NGONI
NGURU
NYAKYUSA
NYAMWEZI
NYANJA
NYASA
NYATHURU
NYIHA
NYIRAMBA
PANGWA
PARE
POGORO
RANGI
RUAHA
RUFIJI
RULI
SAFWA
SANDAWI
SANGU
SHAMBAA
SONJO
SUBI
SUKUMA
SUMBWA
SWAHILI
TAN (TANZANIA-GENERAL)
TAN COAST (TANZANIA-COAST)
T.T. (TANGANYIKA TERRITORY)
T.T. COAST (TAN. TER.-COAST)
VIDUNDA
WANJI
WEMBA
YAO
ZANAKI
ZARAMO
ZIGUA
ZINZA

C2 Species list by Latin name.

ACACIA ABYSSINICA
ACACIA ALBIDA (FAIDHERBIA ALBIDA) *
ACACIA DREPANOLOBIUM
ACACIA GERRARDII
ACACIA LAHAI
ACACIA MELLIFERA *
ACACIA NILOTICA *
ACACIA POLYACANTHA
ACACIA SIEBERANA
ACACIA TANGANYIKENSIS
ACACIA TORTILIS *
ACACIA XANTHOPHLOEA
ADANSONIA DIGITATA *
AFZELIA QUANZENSIS *
ALBIZIA GUMMIFERA *
ALBIZIA HARVEYI
ALBIZIA PETERSIANA
ALBIZIA SCHIMPERANA *
ALBIZIA VERSICOLOR
ALLANBLACKIA STUHLMANNII
ANNONA SENEGALENSIS (A. CHRYSOPHYLLA) *
AZANZA GARCKEANA *
BALANITES AEGYPTIACA *
BERCHEMIA DISCOLOR *
BOSCIA MOSSAMBICENSIS
BRACHYSTEGIA BOEHMII
BRACHYSTEGIA BUSSEI
BRACHYSTEGIA SPICIFORMIS *
BREONADIA SALICINA (ADINA MICROCEPHALA, BREONADIA MICROCEPHALA) *
BRIDELIA MICRANTHA *
BURKEA AFRICANA
CASSIPOUREA MALOSANA
COMBRETUM ADENOGONIUM (C. FRAGRANS, C. GHASALENSE, C. TERNIFOLIUM, C. TETRAPHYLLUM)
COMBRETUM LONGISPICATUM (C. SPICATA)
COMBRETUM MOLLE (C. ATELANTHUM, C. GUEINZII, C. HOLOSERICEUM) *
COMBRETUM ZEYHERI
COMMIPHORA AFRICANA (C. PILOSA) *
COMMIPHORA EMINII (SUBS. ZIMMERMANNII) *
COMMIPHORA MOLLIS (C. STUHLMANNII)
COMMIPHORA TROTHAE
COMMIPHORA UGOGOENSIS
CORDIA AFRICANA (C. ABYSSINICA) *
CORDIA SINENSIS (C. GHARAF, C. ROTHII) *
CROTON MACROSTACHYUS
CROTON MEGALOCARPUS *
DALBERGIA ARBUTIFOLIA
DALBERGIA MELANOXYLON *
DALBERGIA NITIDULA
DICHROSTACHYS CINEREA (D. GLOMERATA, D. NYASSANA) *
DIOSPYROS KIRKII
DIOSPYROS MESPILIFORMIS *
ENTADA ABYSSINICA *

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* The species marked with an asterix are described in the *Species Profiles* chapter.

ERYTHRINA ABYSSINICA (E. TOMENTOSA) *
EUCLEA DIVINORUM
EUPHORBIA CANDELABRUM
EUPHORBIA TIRUCALLI *
FAUREA SALIGNA
FICUS SYCOMORUS (F. GNAPHALOCARPA, F. MUCOSA) *
FICUS THONNINGII (F. NATALENSIS) *
FICUS VALLIS-CHOUDAE
FLACOURTIA INDICA (GMELINA INDICA) *
GREWIA BICOLOR *
GREWIA MOLLIS
GREWIA PLATYCLADA
HAGENIA ABYSSINICA (H. ANTHELMINTICA)
ILEX MITIS
JULBERNARDIA GLOBIFLORA
JUNIPERUS PROCERA *
KHAYA ANTHOTHECA (K. NYASICA) *
KIGELIA AFRICANA (K. AETHIOPICA)
LANNEA SCHWEINFURTHII var. STUHLMANNII
LONCHOCARPUS CAPASSA *
MARKHAMIA OBTUSIFOLIA *
MARKHAMIA ZANZIBARICA (M. ACUMINATA)
MILICIA EXCELSA (CHLOROPHORA EXCELSA) *
OCOTEA USAMBARENSIS *
OLEA CAPENSIS (O. WELWITSCHII) *
OLEA EUROPAEA SUBS. AFRICANA (O. CHRYSOPHYLLA) *
OXYTENANTHERA ABYSSINICA *
PARINARI CURATELLIFOLIA *
PARINARI EXCELSA
PERICOPSIS ANGOLENSIS (AFRORMOSIA ANGOLENSIS)
PODOCARPUS LATIFOLIUS (P. MILANJIANUS)
PRUNUS AFRICANA (PYGEUM AFRICANUM)
PTEROCARPUS ANGOLENSIS *
RAUVOLFIA CAFFRA (R. NATALENSIS) *
RHUS NATALENSIS
SALVADORA PERSICA *
SOLANUM INCANUM
STROPHANTHUS EMINII
STRYCHNOS COCCULOIDES (S. SCHUMANNIANA) *
STRYCHNOS INNOCUA
SYZYGIUM CORDATUM
SYZYGIUM GUINEENSE *
TAMARINDUS INDICA *
TECLEA NOBILIS *
TERMINALIA SERICEA *
TREMA ORIENTALIS (TREMA GUINEENSIS) *
TRICHILIA EMETICA (T. ROKA) *
UAPACA KIRKIANA (U. GOETZEI) *
VANGUERIA INFAUSTA (V. TOMENTOSA)
VANGUERIA MADAGASCARIENSIS *
VITEX DONIANA (V. CUNEATA, V. CIENKOWSKII) *
VITEX PAYOS (V. IRINGENSIS)
WARBURGIA SALUTARIS (W. UGANDENSIS)
XERODERRIS STUHLMANNII
XIMENIA AMERICANA *
XIMENIA CAFFRA *

C3 Common and local names

common or local name → LATIN NAME

aaray - ACACIA XANTHOPHLOEA
aari - ACACIA XANTHOPHLOEA
adina - BREONADIA SALICINA
afa - ACACIA NILOTICA
african blackwood - DALBERGIA MELANOXYLON
african ebony - DIOSPYROS MESPILIFORMIS
african holly - ILEX MITIS
african mahogany - KHAYA ANTHOTHECA
african pencil cedar - JUNIPERUS PROCERA
afromosia - PERICOPSIS ANGOLENSIS
afzelia - AFZELIA QUANZENSIS
akabajan - CASSIPOUREA MALOSANA
alaiseleki - CASSIPOUREA MALOSANA
alchani-lengai - HAGENIA ABYSSINICA
almond, bitter - PRUNUS AFRICANA
almond, indian - TERMINALIA SERICIA
almond, wild - BERCHEMIA DISCOLOR
altarakwai - JUNIPERUS PROCERA
altarara - ACACIA ABYSSINICA
amaafa - PARINARI CURATELLIFOLIA
amafa-aa - PARINARI CURATELLIFOLIA
amafughuni - ACACIA POLYACANTHA
amagendai - COMBRETUM ZEYHERI
ambakofi - AFZELIA QUANZENSIS
angal qanguzi - ERYTHRINA ABYSSINICA
antsi - FICUS SYCOMORUS
apple ring acacia - ACACIA ALBIDA
apple, snot - AZANZA GARCKEANA
apple, wild custard - ANNONA SENEGALENSIS
arei-desu - ENTADA ABYSSINICA
asangupesi - ALBIZIA GUMMIFERA
asaninga - PTEROCARPUS ANGOLENSIS
asi - OXYTENANTHERA ABYSSINICA
athang - EUPHORBIA CANDELABRUM
awartu - SYZYGIUM CORDATUM
awartu - SYZYGIUM GUINEENSE
babaxchet - VANGUERIA INFAUSTA
babool, israel - ACACIA TANGANYIKENSIS
baghalmo-lambi - CORDIA SINENSIS
baghanmo - CORDIA SINENSIS
bakchandi - COMMIPHORA AFRICANA
bamboo, plains - OXYTENANTHERA ABYSSINICA

FAUREA SALIGNA

bamboo, wild - OXYTENANTHERA ABYSSINICA
baobab - ADANSONIA DIGITATA
barabonyoda - ACACIA NILOTICA
barai - VANGUERIA INFAUSTA
barangu - VANGUERIA INFAUSTA
baranku - VANGUERIA INFAUSTA
baryomodi - ACACIA NILOTICA
bean tree - MARKHAMIA ZANZIBARICA
bean tree, golden - MARKHAMIA OBTUSIFOLIA
bean tree, lucky - AFZELIA QUANZENSIS
bean tree, lucky - ERYTHRINA ABYSSINICA
beechwood - FAUREA SALIGNA
behetoh - FAUREA SALIGNA
bitter almond - PRUNUS AFRICANA
black plum - VITEX DONIANA
black thorn - ACACIA MELLIFERA
blackwood, african - DALBERGIA MELANOXYLON
bloodwood - PTEROCARPUS ANGOLENSIS
bmkongo - AFZELIA QUANZENSIS
boriti - TREMA ORIENTALIS
brandybush, false - GREWIA BICOLOR
broad-leaved boscia - BOSCIA MOSSAMBICENSIS
broad-leaved croton - CROTON MACROSTACHYUS
brown olive - OLEA EUROPAEA
bukuumo - TERMINALIA SERICEA
bunkundu - STRYCHNOS INNOCUA
burkea - BURKEA AFRICANA
bushishi - TAMARINDUS INDICA
camphor - OCOTEA USAMBARENSIS
candelabra tree - EUPHORBIA CANDELABRUM
cedar, african pencil - JUNIPERUS PROCERA
chigombo - SALVADORA PERSICA
chinama - COMBRETUM ADENOGONIUM
chingunguti - DICHROSTACHYS CINEREA
common wild fig - FICUS THONNINGII
corky-bark - STRYCHNOS COCCULOIDES
croton - CROTON MEGALOCARPUS
croton, broad-leaved - CROTON MACROSTACHYUS
currant, red - RHUS NATALENSIS
custard apple, wild - ANNONA SENEGALENSIS
dabiri - DICHROSTACHYS CINEREA
dakaumo - ADANSONIA DIGITATA
dakta - FAUREA SALIGNA
daltii - RHUS NATALENSIS
date, desert - BALANITES AEGYPTIACA
datei - KIGELIA AFRICANA
datei - RHUS NATALENSIS
datlii - RHUS NATALENSIS
desert date - BALANITES AEGYPTIACA
dong - AZANZA GARCKEANA
doo' - GREWIA BICOLOR
dukmo - PODOCARPUS LATIFOLIUS
dukti - FAUREA SALIGNA
dukumo - PODOCARPUS LATIFOLIUS
east african camphor - OCOTEA USAMBARENSIS
east african cordia - CORDIA AFRICANA
east african greenheart - WARBURGIA SALUTARIS
east africa yellow wood - PODOCARPUS LATIFOLIUS
ebony - DIOSPYROS KIRKII
ebony, african - DIOSPYROS MESPILIFORMIS
eitoi - CROTON MEGALOCARPUS
eiti - ACACIA MELLIFERA
ekeni - EUCLEA DIVINORUM
elerai - ACACIA XANTHOPHLOEA
elgon olive - OLEA CAPENSIS
eluai - ACACIA DREPANOLOBIUM
eluwai - ACACIA DREPANOLOBIUM
emit - OLEA EUROPAEA
emoloo - AZANZA GARCKEANA
emotoo - AZANZA GARCKEANA
emusigiyai - RHUS NATALENSIS
endisika - DALBERGIA MELANOXYLON
endulele - SOLANUM INCANUM
endundulu - DICHROSTACHYS CINEREA
endulelei, mtula - SOLANUM INCANUM
engumi - VANGUERIA INFAUSTA
engumi - VANGUERIA MADAGASCARIENSIS
entada, tree - ENTADA ABYSSINICA
erakwtu - VANGUERIA MADAGASCARIENSIS
eravande - LANNEA SCHWEINFURTHII
eremiti - SALVADORA PERSICA
esitete - GREWIA BICOLOR
ethiopian mahogany - TRICHILIA EMETICA
euphorbia, rubber hedge - EUPHORBIA TIRUCALLI
falcon's claw acacia - ACACIA POLYACANTHA
false brandybush - GREWIA BICOLOR
false marula - LANNEA SCHWEINFURTHII
fever tree - ACACIA XANTHOPHLOEA
fever tree - PARINARI CURATELLIFOLIA
fig, common wild - FICUS THONNINGII
fig, strangler - FICUS THONNINGII
fig, sycamore - FICUS SYCOMORUS
firaakwi - GREWIA PLATYCLADA
fitismo - ACACIA POLYACANTHA
fitsitoo - ACACIA TORTILIS
flamno-awak - OLEA CAPENSIS
flower, peacock - ALBIZIA GUMMIFERA
forest long-podded albizia - ALBIZIA SCHIMPERANA
fughmo - ACACIA DREPANOLOBIUM
funtsari - CASSIPOUREA MALOSANA
furufinyi - EUCLEA DIVINORUM
furundau - STRYCHNOS INNOCUA
furusinya-nyi - EUCLEA DIVINORUM
ge'kegheke - STRYCHNOS INNOCUA
gall acacia - ACACIA DREPANOLBIUM
ganyamde - BALANITES AEGYPTIACA
gele - ADANSONIA DIGITATA
gembe - DALBERGIA MELANOXYLON
genda-na-mto - ILEX MITIS
gendai - COMBRETUM MOLLE
gendai - COMBRETUM ZEYHERI
gendamo - COMBRETUM MOLLE
gendar-yandi - ADANSONIA DIGITATA
gendumo - COMBRETUM ZEYHERI
geta-da-qwai - SYZYGIUM GUINEENSE
geta-reri - COMBRETUM ZEYHERI
gewawu - DICHROSTACHYS CINEREA
ghaland - ACACIA MELLIFERA
giermo - ACACIA ALBIDA
gindamo - COMBRETUM MOLLE
girwai - DICHROSTACHYS CINEREA
girwangw - DICHROSTACHYS CINEREA
giwermoo - ACACIA ALBIDA
golden bean tree - MARKHAMIA OBTUSIFOLIA
greenheart, east african - WARBURGIA SALUTARIS
guadi - DALBERGIA NITIDULA

gulaami - PRUNUS AFRICANA
guvaami - PRUNUS AFRICANA
gwa'ami - PRUNUS AFRICANA
gwaami - PRUNUS AFRICANA
gwame - PRUNUS AFRICANA
gwasi - OCOTEA USAMBARENSIS
hagenia - GREWIA MOLLIS
haghaiy - AZANZA GARCKEANA
hai - BALANITES AEGYPTIACA
hanarmo - CORDIA SINENSIS
hangal - SOLANUM INCANUM
hangalmo - SOLANUM INCANUM
harbagheidi - ACACIA TORTILIS
harbanghed - ACACIA TORTILIS
harey - RAUVOLFIA CAFFRA
hariie - RAUVOLFIA CAFFRA
hawata - GREWIA PLATYCLADA
hawi - BALANITES AEGYPTIACA
hedge euphorbia, rubber - EUPHORBIA TIRUCALLI
hehemgulungulu - STRYCHNOS INNOCUA
hewasi - JULBERNARDIA GLOBIFLORA
hhangumo - ACACIA ALBIDA
hibiscus, tree - AZANZA GARCKEANA
hlanmo - OLEA EUROPAEA
hohoigara - STRYCHNOS INNOCUA
holly, african - ILEX MITIS
honywam - ACACIA TORTILIS
honywam - ACACIA XANTHOPHLOEA
hook thorn - ACACIA MELLIFERA
hotlimo - BALANITES AEGYPTIACA
hula - PARINARI EXCELSA
ibula - PARINARI CURATELLIFOLIA
idaki - COMMIPHORA AFRICANA
ifurufuru - CROTON MACROSTACHYUS
igudabe - ACACIA ALBIDA
ihanga - HAGENIA ABYSSINICA
ihangala - HAGENIA ABYSSINICA
ii-itsi - TECLEA NOBILIS
iiliisi - TECLEA NOBILIS
ijovya - COMMIPHORA AFRICANA
ijwejwe - ENTADA ABYSSINICA
ikandava - ACACIA ALBIDA
ikeng - EUCLEA DIVINORUM
ikusu - PARINARI CURATELLIFOLIA
ikuu - FICUS VALLIS-CHOUDAE
ilula lyapi - ACACIA DREPANOLOBIUM
ilulu - KHAYA ANTHOTHECA
imivengi - SYZYGIUM CORDATUM
imumua - VANGUERIA MADAGASCARIENSIS
inala - EUPHORBIA TIRUCALLI
iperemesi - GREWIA PLATYCLADA
irakutwa - SYZYGIUM CORDATUM
irgatu - SYZYGIUM GUINEENSE
iroko - MILICIA EXCELSA
iron wood - OLEA CAPENSIS
isaimo - ACACIA ALBIDA
isaimo - BRIDELIA MICRANTHA
isalmo - BRIDELIA MICRANTHA
isaumo - ACACIA SIEBERANA
israel babool - ACACIA TORTILIS
issassa - SYZYGIUM GUINEENSE
iteleko - COMBRETUM ZEYHERI
iteteko - COMBRETUM ZEYHERI
itonto - COMMIPHORA EMINII
itunene - MARKHAMIA OBTUSIFOLIA
iwuruka - EUCLEA DIVINORUM
kababu - ACACIA ALBIDA
kaffir boom - ERYTHRINA ABYSSINICA
kafinulambasa - DALBERGIA NITIDULA
kaguwa - COMBRETUM MOLLE
kaimbi - BURKEA AFRICANA
kakta - FAUREA SALIGNA
kantzi - ACACIA NILOTICA
kapondalambasa - DALBERGIA NITIDULA
karowo - VANGUERIA MADAGASCARIENSIS
kaselenge - TERMINALIA SERICEA
katzi - ACACIA NILOTICA
ketakaiko - TRICHILIA EMETICA
khaangu - ACACIA ALBIDA
khikhiwi - MARKHAMIA OBTUSIFOLIA
kibaranga - EUPHORBIA TIRUCALLI
kichumbichumbi - ERYTHRINA ABYSSINICA
kidamo - DALBERGIA MELANOXYLON
kigomvu - EUPHORBIA TIRUCALLI
kihurgawisu - ACACIA NILOTICA
kijame - ACACIA NILOTICA
kijame - ACACIA POLYACANTHA
kikulagembe - DICHROSTACHYS CINEREA
kilongolo - TECLEA NOBILIS
kimbuti - EUPHORBIA CANDELABRUM
kimwato - ACACIA POLYACANTHA
kinti - DALBERGIA MELANOXYLON
kinwato - ACACIA MELLIFERA
kiputu - VITEX DONIANA
kisambalawe - SYZYGIUM GUINEENSE
kitindi - OXYTENANTHERA ABYSSINICA
kivambang'ombe - BALANITES AEGYPTIACA
kiworo - VANGUERIA MADAGASCARIENSIS
kola - AFZELIA QUANZENSIS
ksimjulu - DICHROSTACHYS CINEREA
kuyu - FICUS SYCOMORUS
lagaang-aawak - GREWIA BICOLOR
lagagir-daat - GREWIA MOLLIS
lagaiyanecheit - OLEA EUROPAEA
laganechet - PODOCARPUS LATIFOLIUS
laganehel - PODOCARPUS LATIFOLIUS
lagangi - GREWIA BICOLOR
lagangi - GREWIA MOLLIS
laghay - AZANZA GARCKEANA
lalei - CROTON MEGALOCARPUS
lali - CROTON MEGALOCARPUS
lama - XIMENIA AMERICANA
lama - XIMENIA CAFFRA
large sourplum - XIMENIA CAFFRA
lasi - OXYTENANTHERA ABYSSINICA
lengijabe - HAGENIA ABYSSINICA
libale - LONCHOCARPUS CAPASSA
lifuwuna - HAGENIA ABYSSINICA
ligabo - PRUNUS AFRICANA
lilac tree - LONCHOCARPUS CAPASSA
lindikiti - VANGUERIA INFAUSTA
lipume - PODOCARPUS LATIFOLIUS
litisi - TECLEA NOBILIS
livindwe - ACACIA POLYACANTHA
livuluku - CROTON MACROSTACHYUS
liwulugu - CROTON MACROSTACHYUS

liwurungu - CROTON MACROSTACHYUS
locheda - ACACIA XANTHOPHLOEA
loliondo - OLEA EUROPAEA
loliondo - OLEA CAPENSIS
lolyondo - OLEA CAPENSIS
lomo-peh - GREWIA PLATYCLADA
lomo - GREWIA BICOLOR
lomo - GREWIA MOLLIS
long-podded albizia - ALBIZIA SCHIMPERANA
loquat, wild - UAPACA KIRKIANA
lorieni - OLEA EUROPAEA
loshoro - VANGUERIA MADAGASCARIENSIS
lucky bean tree - AFZELIA QUANZENSIS
lucky bean tree - ERYTHRINA ABYSSINICA
lungwe - DALBERGIA NITIDULA
lushinga - TREMA ORIENTALIS
luterewe - BRACHYSTEGIA SPICIFORMIS
luwondu - EUPHORBIA TIRUCALLI
luziluzi - HAGENIA ABYSSINICA
m'milwa - STRYCHNOS COCCULOIDES
maase - OCOTEA USAMBARENSIS
maasi - OCOTEA USAMBARENSIS
maauk - TREMA ORIENTALIS
maayangu - XIMENIA CAFFRA
maayangumo - XIMENIA CAFFRA
madawiri - COMMIPHORA EMINII
madonga - STRYCHNOS COCCULOIDES
mafaa - PARINARI CURATELLIFOLIA
magic quarri - EUCLEA DIVINORUM
mahogany, african - KHAYA ANTHOTHECA
mahogany, ethiopian - TRICHILIA EMETICA
mahogany, natal - TRICHILIA EMETICA
mahogany, red - KHAYA ANTHOTHECA
malangali - EUPHORBIA TIRUCALLI
malharimog - VANGUERIA INFAUSTA
malula - ACACIA DREPANOLOBIUM
mamala - OLEA EUROPAEA
mambakofi - AFZELIA QUANZENSIS
mamezi - COMMIPHORA AFRICANA
mamparoi - ILEX MITIS
manenei - ERYTHRINA ABYSSINICA
mangafi - KIGELIA AFRICANA
mangara - EUPHORBIA TIRUCALLI
mangarada - ACACIA MELLIFERA
many-stemmed albizia - ALBIZIA PETERSIANA
manyala - EUPHORBIA TIRUCALLI
manyara - EUPHORBIA TIRUCALLI
manyori - EUPHORBIA TIRUCALLI
mapagola - ACACIA ALBIDA
marabai - CROTON MEGALOCARPUS
mare - LONCHOCARPUS CAPASSA
marie - BRIDELIA MICRANTHA
maroi - COMBRETUM MOLLE
maroro - COMBRETUM MOLLE
marula, false - LANNEA SCHWEINFURTHII
masakta - ALBIZIA GUMMIFERA
masdi - SYZYGIUM GUINEENSE
masi - ILEX MITIS
masojanda - DALBERGIA MELANOXYLON
matharimo - VANGUERIA INFAUSTA
matlarmo - SYZYGIUM GUINEENSE
matungusa - SOLANUM INCANUM
matwa - AZANZA GARCKEANA
mauhekere - EUCLEA DIVINORUM
mawezi - COMMIPHORA AFRICANA
mayenda - BRIDELIA MICRANTHA
mazenzati - ALBIZIA HARVEYI
mazi - ALBIZIA GUMMIFERA
mbadilo - COMBRETUM ADENOGONIUM
mbajiru - SYZYGIUM GUINEENSE
mbajua - GREWIA PLATYCLADA
mbali - CROTON MEGALOCARPUS
mbalibali - ACACIA DREPANOLOBIUM
mbalu - JUNIPERUS PROCERA
mbamba - RAUVOLFIA CAFFRA
mbambakofi - AFZELIA QUANZENSIS
mbambang'oma - BALANITES AEGYPTIACA
mbanga - PERICOPSIS ANGOLENSIS
mbangwe - TRICHILIA EMETICA
mbanjiru - EUCLEA DIVINORUM
mbapu - CORDIA AFRICANA
mbarika - AFZELIA QUANZENSIS
mbarikwa - AFZELIA QUANZENSIS
mbawira - OCOTEA USAMBARENSIS
mbaya - STRYCHNOS INNOCUA
mbechera - JUNIPERUS PROCERA
mbefu - TREMA ORIENTALIS
mbehe - TREMA ORIENTALIS
mbeko - ERYTHRINA ABYSSINICA
mbelambasa - DALBERGIA NITIDULA
mbembakofi - AFZELIA QUANZENSIS
mbilimisi - ERYTHRINA ABYSSINICA
mbilupili - FLACOURTIA INDICA
mbiro - VANGUERIA MADAGASCARIENSIS
mbogwa - KHAYA ANTHOTHECA
mbokwe - ANNONA SENEGALENSIS
mbola plum - PARINARI CURATELLIFOLIA
mbolongo-ya-kibolo - ACACIA DREPANOLOBIUM
mboromo - ALBIZIA GUMMIFERA
mbugwe - COMBRETUM MOLLE
mbuko - TERMINALIA SERICEA
mbula - PARINARI CURATELLIFOLIA
mbula - PARINARI EXCELSA
mbula nyakyusambula - PARINARI CURATELLIFOLIA
mbulu - KHAYA ANTHOTHECA
mbulungo - ACACIA DREPANOLOBIUM
mbunga - OXYTENANTHERA ABYSSINICA
mbuni - PARINARI CURATELLIFOLIA
mbura - PARINARI CURATELLIFOLIA
mbura - PARINARI EXCELSA
mbuui - PARINARI CURATELLIFOLIA
mbuyu - ADANSONIA DIGITATA
mbwewe - TRICHILIA EMETICA
mchai - AZANZA GARCKEANA
mchakaazi - EUPHORBIA TIRUCALLI
mchala - ALBIZIA PETERSIANA
mchekwa - ANNONA SENEGALENSIS
mchelegembe - DICHROSTACHYS CINEREA
mchenga - JULBERNARDIA GLOBIFLORA
mchengo - TRICHILIA EMETICA
mchenje - ALBIZIA SCHIMPERANA
mchese - ACACIA ALBIDA
mchinka - VITEX DONIANA
mchiyo - OLEA CAPENSIS
mchongoma - FLACOURTIA INDICA
mchwezi - SYZYGIUM GUINEENSE

mdaa - EUCLEA DIVINORUM
mdaberi - DICHROSTACHYS CINEREA
mdachi - COMMIPHORA UGOGOENSIS
mdaguata - GREWIA MOLLIS
mdai - TAMARINDUS INDICA
mdala - EUCLEA DIVINORUM
mdama - COMBRETUM MOLLE
mdana - VANGUERIA INFAUSTA
mdana - VANGUERIA MADAGASCARIENSIS
mdavi - CORDIA SINENSIS
mdawi - CORDIA SINENSIS
mdawisogwe - CORDIA SINENSIS
mdee - WARBURGIA SALUTARIS
mdele - WARBURGIA SALUTARIS
mdimu - TECLEA NOBILIS
mdogowe - BREONADIA SALICINA
mdoladole - ACACIA ALBIDA
mdonga - STRYCHNOS COCCULOIDES
mdore - BALANITES AEGYPTIACA
mdrawaka - JUNIPERUS PROCERA
mdubilo - ACACIA NILOTICA
mduguyu - BALANITES AEGYPTIACA
mduka - ALBIZIA GUMMIFERA
mduka - ALBIZIA SCHIMPERANA
mdumwa-kingu - CORDIA SINENSIS
mdundulu - PRUNUS AFRICANA
mdunga - ACACIA POLYACANTHA
mdungwa - KIGELIA AFRICANA
mduwau - GREWIA BICOLOR
meali - CROTON MACROSTACHYUS
meali - CROTON MEGALOCARPUS
medlar, wild - VANGUERIA INFAUSTA
mehengo - TRICHILIA EMETICA
melegea - KIGELIA AFRICANA
melelak - ACACIA LAHAI
melia - CROTON MACROSTACHYUS
melia - CROTON MEGALOCARPUS
meluta - ACACIA DREPANOLOBIUM
membwa - XIMENIA AMERICANA
menday - DALBERGIA ARBUTIFOLIA
mergentu - CROTON MEGALOCARPUS
mfila - ANNONA SENEGALENSIS
mfila - PRUNUS AFRICANA
mfofuru - CROTON MACROSTACHYUS
mfogolo - ALBIZIA HARVEYI
mfoono - HAGENIA ABYSSINICA
mfudu - VITEX DONIANA
mfueta - ALBIZIA PETERSIANA
mfufu - CORDIA AFRICANA
mfufuma-simba - ENTADA ABYSSINICA
mfughuyu - BALANITES AEGYPTIACA
mfuka - FAUREA SALIGNA
mfuku - ACACIA NILOTICA
mfuku - ACACIA NILOTICA
mfulanyelele - PODOCARPUS LATIFOLIUS
mfulu - VITEX DONIANA
mfulu - VITEX PAYOS
mfumbi - KIGELIA AFRICANA
mfumbii - LONCHOCARPUS CAPASSA
mfumbiri - LONCHOCARPUS CAPASSA
mfumbu - BRACHYSTEGIA BOEHMII
mfunguji - AFZELIA QUANZENSIS
mfurangi - ALBIZIA GUMMIFERA
mfuranje - ALBIZIA GUMMIFERA
mfuranje - ALBIZIA SCHIMPERANA
mfurata - DIOSPYROS KIRKII
mfurfuru - CROTON MACROSTACHYUS
mfuru - VITEX DONIANA
mfuruanga - ALBIZIA SCHIMPERANA
mfurufuru - CROTON MACROSTACHYUS
mfurulegea - VITEX DONIANA
mfutambula - ENTADA ABYSSINICA
mfuu - VITEX DONIANA
mfuwau - GREWIA BICOLOR
mfuzu - VITEX DONIANA
mgambo - ILEX MITIS
mgando - BURKEA AFRICANA
mgando mkalati - BURKEA AFRICANA
mgandomkarati - BURKEA AFRICANA
mgandu - BERCHEMIA DISCOLOR
mgandu - BURKEA AFRICANA
mgango - VANGUERIA INFAUSTA
mgege - SYZYGIUM CORDATUM
mgege - SYZYGIUM GUINEENSE
mgelegele - ACACIA NILOTICA
mgelegele - BRACHYSTEGIA BUSSEI
mgelele - DICHROSTACHYS CINEREA
mgembe - DALBERGIA MELANOXYLON
mgembya - DALBERGIA MELANOXYLON
mgendagenda - TREMA ORIENTALIS
mgeye - SYZYGIUM CORDATUM
mgiito - COMBRETUM MOLLE
mgirite - DIOSPYROS MESPILIFORMIS
mgiriti - DIOSPYROS MESPILIFORMIS
mgo - FLACOURTIA INDICA
mgo'ngo'ngo'ngo - COMMIPHORA EMINII
mgobe - VITEX DONIANA
mgodogodo - DIOSPYROS MESPILIFORMIS
mgofu - EUPHORBIA TIRUCALLI
mgola - FLACOURTIA INDICA
mgolamazi - TRICHILIA EMETICA
mgolimazi - TRICHILIA EMETICA
mgombogombo - COMBRETUM LONGISPICATUM
mgombogombo - COMMIPHORA EMINII
mgonendele - ACACIA ALBIDA
mgongoma - AFZELIA QUANZENSIS
mgora - FLACOURTIA INDICA
mgosi, maize - FAUREA SALIGNA
mguagua - MARKHAMIA OBTUSIFOLIA
mguani - MARKHAMIA OBTUSIFOLIA
mguhu - UAPACA KIRKIANA
mguji - BRACHYSTEGIA SPICIFORMIS
mguji - JULBERNARDIA GLOBIFLORA
mgulu - UAPACA KIRKIANA
mgulungungulu - STRYCHNOS INNOCUA
mgunga - ACACIA ALBIDA
mgunga - ACACIA NILOTICA
mgunga - ACACIA POLYACANTHA
mgunga - ACACIA SIEBERANA
mgunga - ACACIA TORTILIS
mgungankunda - ACACIA NILOTICA
mgungankundumuela - ACACIA NILOTICA
mgunure - COMBRETUM MOLLE
mguvani - MARKHAMIA OBTUSIFOLIA
mguwoguwo - MARKHAMIA OBTUSIFOLIA
mgwina - BREONADIA SALICINA

mgwobe - VITEX DONIANA
mhagata - PTEROCARPUS ANGOLENSIS
mhagati - OLEA EUROPAEA
mhalalwa-huba - ERYTHRINA ABYSSINICA
mhande - CROTON MEGALOCARPUS
mhangala - BRACHYSTEGIA BUSSEI
mhangala - BRACHYSTEGIA SPICIFORMIS
mhangala - JULBERNARDIA GLOBIFLORA
mhebi - KHAYA ANTHOTHECA
mhekele - EUCLEA DIVINORUM
mhembete - DALBERGIA MELANOXYLON
mheme - ACACIA TANGANYIKENSIS
mhendabogo - UAPACA KIRKIANA
mhenyi - FAUREA SALIGNA
mheveheve - ERYTHRINA ABYSSINICA
mhimbachigulu - EUCLEA DIVINORUM
mhingi - XIMENIA AMERICANA
mhingo - DALBERGIA MELANOXYLON
mhogolo - ALBIZIA HARVEYI
mhololo - CORDIA SINENSIS
mhora - AFZELIA QUANZENSIS
mhuga - DALBERGIA NITIDULA
mhugu - UAPACA KIRKIANA
mhuku - UAPACA KIRKIANA
mhukwi - DIOSPYROS MESPILIFORMIS
mhula - PARINARI EXCELSA
mhuli, mlukua - FLACOURTIA INDICA
mhundu - STRYCHNOS INNOCUA
mhunga shalo - EUPHORBIA TIRUCALLI
mhunguru-mhomba - RHUS NATALENSIS
mhunguru - RHUS NATALENSIS
mhyenya - CORDIA AFRICANA
michame - ACACIA NILOTICA
miganzula - ENTADA ABYSSINICA
migulu - UAPACA KIRKIANA
minday - DALBERGIA MELANOXYLON
mingi - XIMENIA AMERICANA
mingi - XIMENIA CAFFRA
minighit - EUCLEA DIVINORUM
minza-wigutile - MARKHAMIA ZANZIBARICA
minziigutile - MARKHAMIA ZANZIBARICA
miombwi - ACACIA POLYACANTHA
mionbo - BRACHYSTEGIA BUSSEI
mishighi - TAMARINDUS INDICA
mitanga - ALBIZIA SCHIMPERANA
mithingiti - TAMARINDUS INDICA
mitlighi - TAMARINDUS INDICA
mivare - LONCHOCARPUS CAPASSA
miyombo - BRACHYSTEGIA SPICIFORMIS
mjagengo - TRICHILIA EMETICA
mjarujaru - COMBRETUM MOLLE
mjengu - XIMENIA CAFFRA
mjerijeri - BRACHYSTEGIA BUSSEI
mjiha - DALBERGIA ARBUTIFOLIA
mjiha - DALBERGIA NITIDULA
mjijiva - BALANITES AEGYPTIACA
mjingu mtundui - XIMENIA CAFFRA
mjirya - BALANITES AEGYPTIACA
mjongolo - DIOSPYROS MESPILIFORMIS
mju - TECLEA NOBILIS
mjumbau - VITEX DONIANA
mkaa - TERMINALIA SERICEA
mkadi - DIOSPYROS MESPILIFORMIS
mkaku - LONCHOCARPUS CAPASSA
mkalalwanghuba - ERYTHRINA ABYSSINICA
mkalankanga - ACACIA MELLIFERA
mkalati - BURKEA AFRICANA
mkamati - SYZYGIUM GUINEENSE
mkambala - ACACIA MELLIFERA
mkami - ALBIZIA HARVEYI
mkamye - ALLANBLACKIA STUHLMANNII
mkangazi - KHAYA ANTHOTHECA
mkange - ALLANBLACKIA STUHLMANNII
mkangi - ALLANBLACKIA STUHLMANNII
mkani - ALLANBLACKIA STUHLMANNII
mkanya - ALLANBLACKIA STUHLMANNII
mkanye - ALLANBLACKIA STUHLMANNII
mkarati - BRIDELIA MICRANTHA
mkarakata - BRIDELIA MICRANTHA
mkarakata - BURKEA AFRICANA
mkarambaki - OCOTEA USAMBARENSIS
mkaransatu - ALBIZIA HARVEYI
mkenene - OCOTEA USAMBARENSIS
mkenge - ALBIZIA GUMMIFERA
mkenge - ALBIZIA PETERSIANA
mkenge - ALBIZIA VERSICOLOR
mkenge - EUCLEA DIVINORUM
mkenge-maji - ALBIZIA SCHIMPERANA
mkenge-mayoya - ALBIZIA PETERSIANA
mkenge-mazi - ALBIZIA GUMMIFERA
mkenge-mchala - ALBIZIA GUMMIFERA
mkengemaji : ALBIZIA GUMMIFERA
mkengewa - ACACIA POLYACANTHA
mkenka - KIGELIA AFRICANA
mkensi - PODOCARPUS LATIFOLIUS
mkeragembe - DICHROSTACHYS CINEREA
mkibu - CORDIA AFRICANA
mkilolo - ACACIA ALBIDA
mkinde - DIOSPYROS MESPILIFORMIS
mkindwanzagamba - ALBIZIA VERSICOLOR
mkingila - FICUS VALLIS-CHOUDAE
mkingila - FLACOURTIA INDICA
mkingu - ALBIZIA VERSICOLOR
mkinu - ALBIZIA VERSICOLOR
mkisingo - BALANITES AEGYPTIACA
mkoga - VITEX DONIANA
mkoko - DIOSPYROS MESPILIFORMIS
mkokokivu - DIOSPYROS KIRKII
mkola - AFZELIA QUANZENSIS
mkola - MARKHAMIA OBTUSIFOLIA
mkolakola - BRIDELIA MICRANTHA
mkolakole - BRIDELIA MICRANTHA
mkole - GREWIA BICOLOR
mkole-mweupe - GREWIA BICOLOR
mkole-ngoda - GREWIA BICOLOR
mkololo - ACACIA ALBIDA
mkoma - GREWIA BICOLOR
mkomahoya - PRUNUS AFRICANA
mkomakoma - GREWIA BICOLOR
mkomakoma - GREWIA MOLLIS
mkomalendi - GREWIA BICOLOR
mkomba - AFZELIA QUANZENSIS
mkome - STRYCHNOS COCCULOIDES
mkome - STRYCHNOS INNOCUA
mkomge - AFZELIA QUANZENSIS
mkomu msege - STRYCHNOS INNOCUA

mkonde-konde - PRUNUS AFRICANA
mkondo - ADANSONIA DIGITATA
mkonga - BALANITES AEGYPTIACA
mkongo - AFZELIA QUANZENSIS
mkongo - BALANITES AEGYPTIACA
mkongo - RAUVOLFIA CAFFRA
mkongoe - ACACIA TORTILIS
mkongolo - ACACIA ALBIDA
mkongolo - BRACHYSTEGIA BUSSEI
mkongolo - COMMIPHORA MOLLIS
mkongolo - COMMIPHORA UGOGOENSIS
mkongoni - TRICHILIA EMETICA
mkonola - ANNONA SENEGALENSIS
mkonyo - ANNONA SENEGALENSIS
mkora - ACACIA ALBIDA
mkora - AFZELIA QUANZENSIS
mkora - MARKHAMIA OBTUSIFOLIA
mkuare - DIOSPYROS MESPILIFORMIS
mkubahuhi - LONCHOCARPUS CAPASSA
mkufi - RAUVOLFIA CAFFRA
mkuhu - UAPACA KIRKIANA
mkuju - FICUS SYCOMORUS
mkuju - FICUS VALLIS-CHOUDAE
mkuku - ACACIA POLYACANTHA
mkulajembe - DICHROSTACHYS CINEREA
mkulo - OCOTEA USAMBARENSIS
mkulua - STRYCHNOS INNOCUA
mkulugundu - STRYCHNOS INNOCUA
mkulwa - STRYCHNOS INNOCUA
mkulwie - DIOSPYROS MESPILIFORMIS
mkumburu - HAGENIA ABYSSINICA
mkuna - RAUVOLFIA CAFFRA
mkunghuni - SALVADORA PERSICA
mkunguga - LONCHOCARPUS CAPASSA
mkungugu - ACACIA TORTILIS
mkungulu - RHUS NATALENSIS
mkungwina - TRICHILIA EMETICA
mkuni - BERCHEMIA DISCOLOR
mkunungu - VITEX DONIANA
mkunyu - FICUS SYCOMORUS
mkuro - OCOTEA USAMBARENSIS
mkurungu - CROTON MACROSTACHYUS
mkusu - UAPACA KIRKIANA
mkuti - BRACHYSTEGIA SPICIFORMIS
mkuu - FICUS THONNINGII
mkuu - FICUS VALLIS-CHOUDAE
mkuuyu - FICUS VALLIS-CHOUDAE
mkuyu-mpeho - FICUS VALLIS-CHOUDAE
mkuyu - FICUS SYCOMORUS
mkwagushashi - ALBIZIA HARVEYI
mkwaja - TAMARINDUS INDICA
mkwaju - TAMARINDUS INDICA
mkwaka - STRYCHNOS INNOCUA
mkwanga - ACACIA POLYACANTHA
mkwata - STRYCHNOS INNOCUA
mkwazu - TAMARINDUS INDICA
mkwe - BRACHYSTEGIA SPICIFORMIS
mkweso - TAMARINDUS INDICA
mkwesu - TAMARINDUS INDICA
mkwezu - TAMARINDUS INDICA
mlaagi - HAGENIA ABYSSINICA
mlahi - OXYTENANTHERA ABYSSINICA
mlalai - CROTON MEGALOCARPUS
mlalambo - SYZYGIUM GUINEENSE
mlalo - JUNIPERUS PROCERA
mlama - COMBRETUM ADENOGONIUM
mlama - COMBRETUM LONGISPICATUM
mlama - COMBRETUM MOLLE
mlama - COMBRETUM ZEYHERI
mlama mwenge - COMBRETUM MOLLE
mlama-we-ng'ala - COMBRETUM ZEYHERI
mlamadoli - COMBRETUM MOLLE
mlambadanda - PTEROCARPUS ANGOLENSIS
mlamuru - OLEA EUROPAEA
mlandee - CROTON MEGALOCARPUS
mlandoge - FICUS THONNINGII
mlanga - HAGENIA ABYSSINICA
mlangali - EUPHORBIA CANDELABRUM
mlangali - BRIDELIA MICRANTHA
mlangali - EUPHORBIA CANDELABRUM
mlanzi - OXYTENANTHERA ABYSSINICA
mlelega - COMBRETUM ZEYHERI
mlengwelengwe - RAUVOLFIA CAFFRA
mlenzi - ERYTHRINA ABYSSINICA
mlifu - WARBURGIA SALUTARIS
mlimangombe - TECLEA NOBILIS
mlinzi - ERYTHRINA ABYSSINICA
mlozilozi - HAGENIA ABYSSINICA
mluhhi - EUPHORBIA TIRUCALLI
mlukua mhuli - FLACOURTIA INDICA
mluma - ACACIA ALBIDA
mlumba - FICUS THONNINGII
mlungu-magoma - ERYTHRINA ABYSSINICA
mlungu-matumbi - ERYTHRINA ABYSSINICA
mlyali - MARKHAMIA OBTUSIFOLIA
mmanga - PERICOPSIS ANGOLENSIS
mnadsi - PARINARI CURATELLIFOLIA
mnago - BERCHEMIA DISCOLOR
mnala - EUPHORBIA TIRUCALLI
mnali - LONCHOCARPUS CAPASSA
mnama - COMBRETUM MOLLE
mnangali - EUPHORBIA CANDELABRUM
mnara - EUPHORBIA TIRUCALLI
mnazi - PARINARI CURATELLIFOLIA
mndulele - SOLANUM INCANUM
mnduriduri - ACACIA DREPANOLOBIUM
mnembu - CORDIA SINENSIS
mnembwa - XIMENIA AMERICANA
mnembwa - XIMENIA CAFFRA
mnembwa mudo - XIMENIA AMERICANA
mng'akora - DIOSPYROS KIRKII
mng'unga - FLACOURTIA INDICA
mninga - PTEROCARPUS ANGOLENSIS
mnoge - PODOCARPUS LATIFOLIUS
mnumbulu - DIOSPYROS KIRKII
mnyabwita - VANGUERIA INFAUSTA
mnyaki - CROTON MEGALOCARPUS
mnyala - EUPHORBIA TIRUCALLI
mnyamendi - LANNEA SCHWEINFURTHII
mnyanza - ALBIZIA VERSICOLOR
mnyara - EUPHORBIA TIRUCALLI
mnyenye - XERODERRIS STUHLMANNII
mnyenzi - BRACHYSTEGIA BOEHMII
mnyinga - XERODERRIS STUHLMANNII
mnyondolya - FLACOURTIA INDICA
mnyono - SYZYGIUM CORDATUM

mnyowa - STRYCHNOS COCCULOIDES
mnyumbu - LANNEA SCHWEINFURTHII
mnywewa - STRYCHNOS COCCULOIDES
mnzasa - ACACIA NILOTICA
mobibi - DALBERGIA NITIDULA
mochocho - CORDIA SINENSIS
modee - SALVADORA PERSICA
mohoromo - BALANITES AEGYPTIACA
mohowe - TREMA ORIENTALIS
moisiranga - ALBIZIA GUMMIFERA
monde - BRIDELIA MICRANTHA
mongarama - AFZELIA QUANZENSIS
monko-ya-nyika - TRICHILIA EMETICA
monya - DALBERGIA NITIDULA
moonga - ACACIA TORTILIS
morufu - ACACIA POLYACANTHA
mosingisi - BOSCIA MOSSAMBICENSIS
mosinko - TAMARINDUS INDICA
mosironga - ALBIZIA GUMMIFERA
mosisiviri - ALBIZIA PETERSIANA
mosofwa - KIGELIA AFRICANA
mototi - COMBRETUM MOLLE
mototi - COMBRETUM ZEYHERI
moumba - TERMINALIA SERICEA
movunga - ACACIA TORTILIS
moya - TAMARINDUS INDICA
mpagata - PTEROCARPUS ANGOLENSIS
mpande - STRYCHNOS COCCULOIDES
mpangala - DICHROSTACHYS CINEREA
mpapa - BRACHYSTEGIA SPICIFORMIS
mpapa - MARKHAMIA OBTUSIFOLIA
mpapala - LONCHOCARPUS CAPASSA
mpegele - SYZYGIUM CORDATUM
mpegele - SYZYGIUM GUINEENSE
mpehe - TREMA ORIENTALIS
mpehi - TREMA ORIENTALIS
mpeho - TREMA ORIENTALIS
mpehwe - TREMA ORIENTALIS
mpela - ADANSONIA DIGITATA
mpelemehe - GREWIA PLATYCLADA
mpelemense - GREWIA PLATYCLADA
mpelemese - GREWIA PLATYCLADA
mpembati - PRUNUS AFRICANA
mpembu - PARINARI CURATELLIFOLIA
mpendo - VANGUERIA INFAUSTA
mpera - TREMA ORIENTALIS
mpera-mwitu - STRYCHNOS COCCULOIDES
mperemehe - GREWIA BICOLOR
mperemezi - GREWIA PLATYCLADA
mpesi - TREMA ORIENTALIS
mpessi - TREMA ORIENTALIS
mpeswe - TREMA ORIENTALIS
mpilipili - ERYTHRINA ABYSSINICA
mpimati - JULBERNARDIA GLOBIFLORA
mpindimbi - VITEX DONIANA
mpingi - XIMENIA AMERICANA
mpingipingi - XIMENIA AMERICANA
mpingo - DALBERGIA MELANOXYLON
mpitimbi - VITEX DONIANA
mpiwipwi - LANNEA SCHWEINFURTHII
mpogo - ALBIZIA HARVEYI
mpogola - ACACIA ALBIDA
mpogolo - ALBIZIA HARVEYI
mpogoro - ACACIA ALBIDA
mponda - COMMIPHORA AFRICANA
mponda - COMMIPHORA EMINII
mponda - COMMIPHORA MOLLIS
mponda - COMMIPHORA TROTHAE
mponda - COMMIPHORA UGOGOENSIS
mpugapuga - MARKHAMIA OBTUSIFOLIA
mpugupugu - RAUVOLFIA CAFFRA
mpugusi - MILICIA EXCELSA
mpuguswa - FLACOURTIA INDICA
mpukupuku - BURKEA AFRICANA
mpulu - VITEX DONIANA
mpululu - TERMINALIA SERICEA
mpundu - STRYCHNOS INNOCUA
mpundwe - XIMENIA AMERICANA
mpunga - OXYTENANTHERA ABYSSINICA
mpupi - LANNEA SCHWEINFURTHII
mpuru mukoronto - VITEX DONIANA
mputsa - TECLEA NOBILIS
mramba - ADANSONIA DIGITATA
mrambuchi - FLACOURTIA INDICA
mranda - ACACIA ALBIDA
mribwampara - LANNEA SCHWEINFURTHII
mrie - MILICIA EXCELSA
mrihi - BRACHYSTEGIA SPICIFORMIS
mrimba - ACACIA TORTILIS
mringaringa - CORDIA AFRICANA
mriri - ERYTHRINA ABYSSINICA
mrisirisi - ANNONA SENEGALENSIS
mriti - BRACHYSTEGIA SPICIFORMIS
mrosirose - HAGENIA ABYSSINICA
mrozirozi - HAGENIA ABYSSINICA
mrugara - ACACIA MELLIFERA
mruka - ALBIZIA GUMMIFERA
mruka - ALBIZIA SCHIMPERANA
mruku - COMBRETUM MOLLE
mrumbapori - FICUS THONNINGII
msaamaji - ALBIZIA GUMMIFERA
msaamaji - ALBIZIA PETERSIANA
msabua - RAUVOLFIA CAFFRA
msabula - PARINARI EXCELSA
msada - VANGUERIA INFAUSTA
msada - VANGUERIA MADAGASCARIENSIS
msagara - RHUS NATALENSIS
msagasi - COMMIPHORA AFRICANA
msakasaka - RHUS NATALENSIS
msakawa - LANNEA SCHWEINFURTHII
msaki - SALVADORA PERSICA
msakiro - OLEA EUROPAEA
msalazi - SYZYGIUM GUINEENSE
msambaran - SYZYGIUM GUINEENSE
msambarao - SYZYGIUM GUINEENSE
msambarawe - VANGUERIA INFAUSTA
msambo - ALLANBLACKIA STUHLMANNII
msambu - ALLANBLACKIA STUHLMANNII
msambu-mbwiti - ALLANBLACKIA STUHLMANNII
msambuchi - FLACOURTIA INDICA
msame - ALBIZIA GUMMIFERA
msamiko - BRIDELIA MICRANTHA
msana - COMBRETUM ZEYHERI
msanda - VANGUERIA INFAUSTA
msane - BRACHYSTEGIA BUSSEI
msanga - ALBIZIA GUMMIFERA

msangala - BURKEA AFRICANA
msanghwa - KIGELIA AFRICANA
msangula - RHUS NATALENSIS
msangura - RHUS NATALENSIS
msanguru - SYZYGIUM GUINEENSE
msanguti - TRICHILIA EMETICA
msaningala - ENTADA ABYSSINICA
msantu - XIMENIA AMERICANA
msaru - LANNEA SCHWEINFURTHII
msarwa - ENTADA ABYSSINICA
msasa - ACACIA MELLIFERA
msasa - ANNONA SENEGALENSIS
msasa - TREMA ORIENTALIS
msaula - PARINARI EXCELSA
msawanyama - DICHROSTACHYS CINEREA
msawero - ACACIA TORTILIS
msawola - PARINARI CURATELLIFOLIA
msawula - PARINARI CURATELLIFOLIA
msayu - LANNEA SCHWEINFURTHII
mschihui - SYZYGIUM GUINEENSE
mse - PODOCARPUS LATIFOLIUS
mse-mawa - PODOCARPUS LATIFOLIUS
mseaka - XIMENIA CAFFRA
msega - FAUREA SALIGNA
msege - STRYCHNOS INNOCUA
msegwe - STROPHANTHUS EMINII
mseka - XIMENIA CAFFRA
msekichanga - PODOCARPUS LATIFOLIUS
mselemko - JUNIPERUS PROCERA
mselemuka - JUNIPERUS PROCERA
msembere - AZANZA GARCKEANA
msena-mawe - PODOCARPUS LATIFOLIUS
mseneo - PRUNUS AFRICANA
msengela - CASSIPOUREA MALOSANA
msengele - SYZYGIUM GUINEENSE
msengwe - STROPHANTHUS EMINII
msense - RHUS NATALENSIS
msenswa - RHUS NATALENSIS
mseri - OCOTEA USAMBARENSIS
msesawe - RAUVOLFIA CAFFRA
msesawe - RAUVOLFIA CAFFRA
mseso - PODOCARPUS LATIFOLIUS
mseveya - ALBIZIA GUMMIFERA
msewe - BRACHYSTEGIA SPICIFORMIS
mshai - ALBIZIA GUMMIFERA
mshai - ALBIZIA SCHIMPERANA
mshai-mawe - ALBIZIA SCHIMPERANA
mshamako - BRIDELIA MICRANTHA
mshambo - ALLANBLACKIA STUHLMANNII
mshanulo - TREMA ORIENTALIS
mshasha - FICUS THONNINGII
msheka - XIMENIA AMERICANA
msheka - XIMENIA CAFFRA
mshinda - TREMA ORIENTALIS
mshinga - TREMA ORIENTALIS
mshio - OLEA CAPENSIS
mshishi - TAMARINDUS INDICA
mshiwi - SYZYGIUM CORDATUM
mshiyo - OLEA CAPENSIS
mshunduzi - CROTON MACROSTACHYUS
msibisibi - OCOTEA USAMBARENSIS
msigajembe - OLEA EUROPAEA
msighe - LANNEA SCHWEINFURTHII
msima - JUNIPERUS GLOBIFLORA
msimira - TERMINALIA SERICEA
msinantemo - DALBERGIA NITIDULA
msindangurwe - DIOSPYROS MESPILIFORMIS
msinde - DIOSPYROS MESPILIFORMIS
msinga - TREMA ORIENTALIS
msingila - FLACOURTIA INDICA
msingisa - BOSCIA MOSSAMBICENSIS
msingo - JUNIPERUS PROCERA
msinira - TERMINALIA SERICEA
msinzizi - CORDIA AFRICANA
msirgu - LANNEA SCHWEINFURTHII
msisa - TAMARINDUS INDICA
msisi - FAUREA SALIGNA
msisi - TAMARINDUS INDICA
msisimisi - ALBIZIA HARVEYI
msisina - ALBIZIA HARVEYI
msisivini - ALBIZIA HARVEYI
msivia - SYZYGIUM CORDATUM
msiviti - ERYTHRINA ABYSSINICA
msiyu - LANNEA SCHWEINFURTHII
msize mgosi - FAUREA SALIGNA
msokonoi - WARBURGIA SALUTARIS
msolola - ALBIZIA PETERSIANA
msomvugo - COMMIPHORA AFRICANA
msopa - BRIDELIA MICRANTHA
msoso - PODOCARPUS LATIFOLIUS
mssuku - UAPACA KIRKIANA
mstunga - RHUS NATALENSIS
msu - SYZYGIUM CORDATUM
msuake - SALVADORA PERSICA
msugussu - FLACOURTIA INDICA
msuju - CROTON MACROSTACHYUS
msukanzi - ACACIA POLYACANTHA
msuku - UAPACA KIRKIANA
msule - MILICIA EXCELSA
msumai - RAUVOLFIA CAFFRA
msumba - BRIDELIA MICRANTHA
msungu - FLACOURTIA INDICA
msungulu - STROPHANTHUS EMINII
msungulula - STROPHANTHUS EMINII
msungululu - STROPHANTHUS EMINII
msungunde - SYZYGIUM CORDATUM
msungururu - STROPHANTHUS EMINII
msungusu - FLACOURTIA INDICA
msunguti - KIGELIA AFRICANA
msungwe - STRYCHNOS INNOCUA
msusu - COMMIPHORA UGOGOENSIS
mswake - SALVADORA PERSICA
mswaki - SALVADORA PERSICA
mswere - GREWIA BICOLOR
mtalala mweupe - SYZYGIUM CORDATUM
mtalabanda - MARKHAMIA ZANZIBARICA
mtalavanda - MARKHAMIA ZANZIBARICA
mtalawanda - MARKHAMIA ZANZIBARICA
mtalula - MILICIA EXCELSA
mtama - AFZELIA QUANZENSIS
mtambaa - OCOTEA USAMBARENSIS
mtamioi - OLEA EUROPAEA
mtandaruka - TRICHILIA EMETICA
mtandi - KIGELIA AFRICANA
mtanga - ALBIZIA GUMMIFERA
mtanga - STRYCHNOS INNOCUA

mtanga - TERMINALIA SERICEA
mtangati - ENTADA ABYSSINICA
mtarakwa - JUNIPERUS PROCERA
mtarawanda - MARKHAMIA OBTUSIFOLIA
mtarewanda - MARKHAMIA ZANZIBARICA
mtarwenda - MARKHAMIA ZANZIBARICA
mtaswa - FLACOURTIA INDICA
mtata - JULBERNARDIA GLOBIFLORA
mtawa - FLACOURTIA INDICA
mtela - ANNONA SENEGALENSIS
mtelawa - RAUVOLFIA CAFFRA
mtelwa - COMMIPHORA AFRICANA
mtembo - KHAYA ANTHOTHECA
mtengotengo - TRICHILIA EMETICA
mtenza, mtoma - FICUS THONNINGII
mteteleka - FAUREA SALIGNA
mtibari - COMBRETUM MOLLE
mtiegu - VANGUERIA INFAUSTA
mtimai - TRICHILIA EMETICA
mtimaji - TRICHILIA EMETICA
mtindiyombo - BRACHYSTEGIA BUSSEI
mtiti - ERYTHRINA ABYSSINICA
mtitu - DIOSPYROS MESPILIFORMIS
mtoa-mada - OCOTEA USAMBARENSIS
mtobo - AZANZA GARCKEANA
mtogho - AZANZA GARCKEANA
mtokatoke - LANNEA SCHWEINFURTHII
mtokosi - PODOCARPUS LATIFOLIUS
mtolo - STROPHANTHUS EMINII
mtoma mtenza - FICUS THONNINGII
mtomoko - ANNONA SENEGALENSIS
mtondo - STROPHANTHUS EMINII
mtondolo - BRACHYSTEGIA SPICIFORMIS
mtondoo - KHAYA ANTHOTHECA
mtondoro - JULBERNARDIA GLOBIFLORA
mtondote - BRACHYSTEGIA SPICIFORMIS
mtonga - STRYCHNOS COCCULOIDES
mtonga - STRYCHNOS INNOCUA
mtongosa - PODOCARPUS LATIFOLIUS
mtonkwe - ANNONA SENEGALENSIS
mtoni, mfuru ya - VITEX DONIANA
mtono - COMMIPHORA UGOGOENSIS
mtonya - ACACIA POLYACANTHA
mtoo - AZANZA GARCKEANA
mtope tope - ANNONA SENEGALENSIS
mtopetope - ANNONA SENEGALENSIS
mtopotopo - ACACIA POLYACANTHA
mtosi - PODOCARPUS LATIFOLIUS
mtovo - AZANZA GARCKEANA
mtowo - AZANZA GARCKEANA
mtowo - STROPHANTHUS EMINII
mtoyo - AZANZA GARCKEANA
mtschamwa - FICUS THONNINGII
mtua - SOLANUM INCANUM
mtula - AZANZA GARCKEANA
mtula - SOLANUM INCANUM
mtula endulelei - SOLANUM INCANUM
mtulanzila - ALBIZIA VERSICOLOR
mtulenya - HAGENIA ABYSSINICA
mtumbati - PTEROCARPUS ANGOLENSIS
mtumbati jangwa - PTEROCARPUS ANGOLENSIS
mtumbui tumbui - XIMENIA AMERICANA
mtundakula - XIMENIA AMERICANA
mtundarai - DICHROSTACHYS CINEREA
mtundu - BRACHYSTEGIA SPICIFORMIS
mtundu - LANNEA SCHWEINFURTHII
mtundui - XIMENIA CAFFRA
mtundukarya - FLACOURTIA INDICA
mtundulu - DICHROSTACHYS CINEREA
mtunduru - DICHROSTACHYS CINEREA
mtundwa - XIMENIA AMERICANA
mtundwa - XIMENIA CAFFRA
mtundwahai - XIMENIA AMERICANA
mtundwe - XIMENIA AMERICANA
mtundwe - XIMENIA CAFFRA
mtundwi - XIMENIA AMERICANA
mtunguja - SOLANUM INCANUM
mtungujamito - SOLANUM INCANUM
mtungululu - STROPHANTHUS EMINII
mtungusa - SOLANUM INCANUM
mtuntwi - COMMIPHORA AFRICANA
mtunumbi - RHUS NATALENSIS
mturituri - COMMIPHORA AFRICANA
mturungu - HAGENIA ABYSSINICA
mtwa - AZANZA GARCKEANA
mtwentwe - RAUVOLFIA CAFFRA
mtwitwi - COMMIPHORA AFRICANA
muanziri - PODOCARPUS LATIFOLIUS
muba - JULBERNARDIA GLOBIFLORA
mubilu - VANGUERIA MADAGASCARIENSIS
mubula - PARINARI CURATELLIFOLIA
mubulagankuku - RHUS NATALENSIS
mubundu - ENTADA ABYSSINICA
muche - SALVADORA PERSICA
mudaa - EUCLEA DIVINORUM
mudi - FAUREA SALIGNA
mudi - OLEA CAPENSIS
mudso - TECLEA NOBILIS
mudugunga - BALANITES AEGYPTIACA
mudy - PRUNUS AFRICANA
mudzo - TECLEA NOBILIS
muegea - KIGELIA AFRICANA
muela - ACACIA NILOTICA
mueni - PRUNUS AFRICANA
muesa - BRIDELIA MICRANTHA
mufita - VITEX DONIANA
mufitanda - VANGUERIA INFAUSTA
mufogoo - ALBIZIA HARVEYI
mufubia - PRUNUS AFRICANA
mufuulu - TERMINALIA SERICEA
muganda - PARINARI EXCELSA
mugando mkalati - BURKEA AFRICANA
mugege - SYZYGIUM CORDATUM
mugelagela - ENTADA ABYSSINICA
mugombwa - COMBRETUM MOLLE
mugu - ACACIA POLYACANTHA
mugumba - ACACIA TANGANIKENSIS
mugumo - FICUS THONNINGII
mugumo-wa-ntwike - FICUS THONNINGII
mugunga - ACACIA TORTILIS
mugunguti - KIGELIA AFRICANA
mugusu - UAPACA KIRKIANA
muguti - BRACHYSTEGIA SPICIFORMIS
muhagata - PTEROCARPUS ANGOLENSIS
muhagati - OLEA EUROPAEA
muhande - CROTON MEGALOCARPUS

muhanyati - COMBRETUM ZEYHERI
muhare - ACACIA TORTILIS
muhehefu - RHUS NATALENSIS
muhemi - ERYTHRINA ABYSSINICA
muheti - OCOTEA USAMBARENSIS
muhihi - CROTON MEGALOCARPUS
muhingi - XIMENIA AMERICANA
muhingilo - LANNEA SCHWEINFURTHII
muhinko - ACACIA NILOTICA
muhiya - WARBURGIA SALUTARIS
muhondobogo - LANNEA SCHWEINFURTHII
muhu - SYZYGIUM CORDATUM
muhu - SYZYGIUM GUINEENSE
muhuba - SYZYGIUM GUINEENSE
muhugu - CROTON MACROSTACHYUS
muhulo - SYZYGIUM CORDATUM
muhulo - SYZYGIUM GUINEENSE
muhundwa - STRYCHNOS INNOCUA
mununga - ACACIA TORTILIS
muhuti - ERYTHRINA ABYSSINICA
muhuwa - CROTON MACROSTACHYUS
muiru - VANGUERIA INFAUSTA
muiza - BRIDELIA MICRANTHA
mujehe - ACACIA ALBIDA
mujuhu - COMMIPHORA AFRICANA
mujujumi - ACACIA MELLIFERA
mukalakanga - DICHROSTACHYS CINEREA
mukaransatu - ALBIZIA HARVEYI
mukata - JULBERNARDIA GLOBIFLORA
mukeregembe - DICHROSTACHYS CINEREA
mukese - ACACIA POLYACANTHA
mukoma - GREWIA BICOLOR
mukoma - GREWIA MOLLIS
mukomo - STRYCHNOS INNOCUA
mukora - AFZELIA QUANZENSIS
mukoronto - VITEX DONIANA
mukumari - CORDIA AFRICANA
mukungulusuli - VANGUERIA INFAUSTA
mukuruguru - CROTON MACROSTACHYUS
mukuwe - BRIDELIA MICRANTHA
mukuyu - FICUS SYCOMORUS
mula - PARINARI EXCELSA
mulade - VANGUERIA MADAGASCARIENSIS
mulade-mujenghuma - VANGUERIA INFAUSTA
mulahay - EUPHORBIA TIRUCALLI
mulama - COMBRETUM MOLLE
mulambo - SYZYGIUM GUINEENSE
mulanzi - OXYTENANTHERA ABYSSINICA
mulati - MARKHAMIA OBTUSIFOLIA
mulemugu - CROTON MACROSTACHYUS
mulera - ACACIA XANTHOPHLOEA
mulinzi - ERYTHRINA ABYSSINICA
mulughwai - EUPHORBIA TIRUCALLI
mulugu - CROTON MACROSTACHYUS
mulugu - ERYTHRINA ABYSSINICA
muluhhay - EUPHORBIA TIRUCALLI
mulunzi - KIGELIA AFRICANA
muluzyaminzi - COMBRETUM ADENOGONIUM
mulwaghai - EUPHORBIA TIRUCALLI
mumbapa - MARKHAMIA OBTUSIFOLIA
mumbu - LANNEA SCHWEINFURTHII
mumendo - LANNEA SCHWEINFURTHII
mumilwa - STRYCHNOS COCCULOIDES
mumirwa - STRYCHNOS INNOCUA
mumora - PARINARI CURATELLIFOLIA
mumu-muzura - FICUS THONNINGII
mumundu - STRYCHNOS INNOCUA
mumura - PARINARI CURATELLIFOLIA
mumwilili - MARKHAMIA OBTUSIFOLIA
munanzi - PARINARI CURATELLIFOLIA
mundu - BRACHYSTEGIA SPICIFORMIS
mung'ulung'ulu - STRYCHNOS INNOCUA
mungu - ERYTHRINA ABYSSINICA
mungunga - ACACIA ALBIDA
mungungu - KIGELIA AFRICANA
mungurufa - ACACIA POLYACANTHA
munhulwa - STRYCHNOS INNOCUA
munjeja - DALBERGIA NITIDULA
munusi - ACACIA SIEBERANA
munyaa - EUPHORBIA TIRUCALLI
munyaga - TERMINALIA SERICEA
munyala - EUPHORBIA TIRUCALLI
munyam-wonyu - FICUS THONNINGII
munyamaji - BRIDELIA MICRANTHA
munyeraminzi - BRIDELIA MICRANTHA
munzati - ENTADA ABYSSINICA
mupako - DALBERGIA MELANOXYLON
mupongoro - ACACIA ALBIDA
muranganji - OLEA EUROPAEA
murogho - AZANZA GARCKEANA
murugara - ACACIA MELLIFERA
muruguya - BALANITES AEGYPTIACA
muruguyu - BALANITES AEGYPTIACA
murunda - ACACIA ALBIDA
murungu - ERYTHRINA ABYSSINICA
murya - ACACIA XANTHOPHLOEA
musagha - LANNEA SCHWEINFURTHII
musamtu - XIMENIA CAFFRA
musangisangi - ENTADA ABYSSINICA
museka - XIMENIA CAFFRA
mushargi - OLEA CAPENSIS
musheshe - RHUS NATALENSIS
musikili - TRICHILIA EMETICA
musikizi - EUCLEA DIVINORUM
muslmihi - ALBIZIA PETERSIANA
musina - JULBERNARDIA GLOBIFLORA
musine - CROTON MEGALOCARPUS
musingati - CORDIA AFRICANA
musingisa - FLACOURTIA INDICA
musisa - TAMARINDUS INDICA
musisigulu - ALBIZIA PETERSIANA
musisiviri - ALBIZIA HARVEYI
musiwisiwi - OCOTEA USAMBARENSIS
mustard tree - SALVADORA PERSICA
musuake - SALVADORA PERSICA
musuma - GREWIA MOLLIS
musuna-nu-kuu - GREWIA BICOLOR
musungua - DALBERGIA ARBUTIFOLIA
musuni - WARBURGIA SALUTARIS
msunguti - RAUVOLFIA CAFFRA
musuruwantyasa - DICHROSTACHYS CINEREA
mususu-nsusu - COMMIPHORA UGOGOENSIS
musuva - KIGELIA AFRICANA
muswaru - SYZYGIUM GUINEENSE
musyunga - RHUS NATALENSIS
mutago - AZANZA GARCKEANA

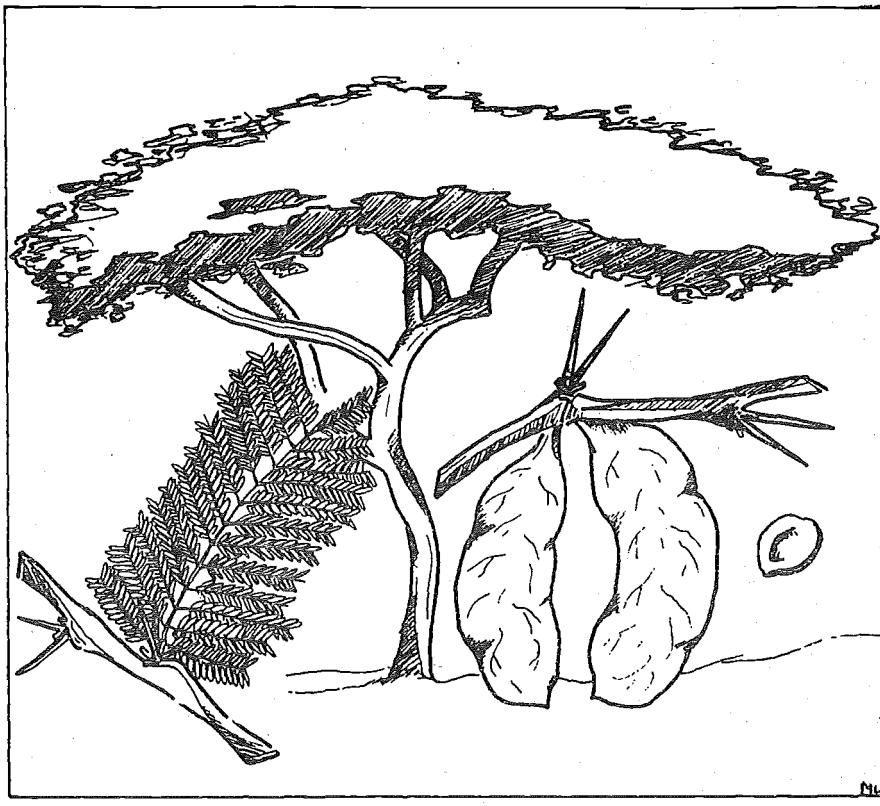
mutobo - AZANZA GARCKEANA
mutogo - AZANZA GARCKEANA
mutrogho - AZANZA GARCKEANA
mutu - RAUVOLFIA CAFFRA
mutuhu - XIMENIA AMERICANA
mutundu - DICHROSTACHYS CINEREA
mutundurunt - DICHROSTACHYS CINEREA
mutundwe - XIMENIA CAFFRA
mututu - TRICHILIA EMETICA
mututututu - BRIDELIA MICRANTHA
muula - PARINARI EXCELSA
muulungu - CROTON MACROSTACHYUS
muuri - PRUNUS AFRICANA
muuwa - PARINARI EXCELSA
muuwe - TREMA ORIENTALIS
muuyu - ADANSONIA DIGITATA
muva - JULBERNARDIA GLOBIFLORA
muvale - LONCHOCARPUS CAPASSA
muvalevale - LONCHOCARPUS CAPASSA
muvambang'oma - BALANITES AEGYPTIACA
muvanga - PERICOPSIS ANGOLENSIS
muvange - PERICOPSIS ANGOLENSIS
muvelevele - STROPHANTHUS EMINII
muvembadanda - PTEROCARPUS ANGOLENSIS
muvenge - SYZYGIUM GUINEENSE
muvengi - SYZYGIUM CORDATUM
muvengi - SYZYGIUM GUINEENSE
muveriveri - STROPHANTUS EMINII
muverivevi - RAUVOLFIA CAFFRA
muviru - VANGUERIA MADAGASCARIENSIS
muviru - VITEX DONIANA
muvirwa barai - VANGUERIA INFAUSTA
muvula - PARINARI CURATELLIFOLIA
muvulagavega - ACACIA NILOTICA
muvuluvulu - DICHROSTACHYS CINEREA
muvuru - VITEX DONIANA
muwa - JULBERNARDIA GLOBIFLORA
muwa - PARINARI EXCELSA
muwambangoma - BALANITES AEGYPTIACA
mwana, nzakala we - DIOSPYROS MESPILIFORMIS
mwandu - EUPHORBIA CANDELABRUM
muwanga - PERICOPSIS ANGOLENSIS
muwawa - KHAYA ANTHOTHECA
muwima - PODOCARPUS LATIFOLIUS
muwindi - ACACIA POLYACANTHA
muwisa - BRACHYSTEGIA SPICIFORMIS
muwomo - FICUS THONNINGII
muwong - OCOTEA USAMBARENSIS
muwumbu - LANNEA SCHWEINFURTHII
muyanzi - MILICIA EXCELSA
muyere - BRACHYSTEGIA BOEHMII
muyesani - RAUVOLFIA CAFFRA
muyombo - BRACHYSTEGIA BOEHMII
muyombo - BRACHYSTEGIA SPICIFORMIS
muyuyu - MARKHAMIA OBTUSIFOLIA
muzo - TECLEA NOBILIS
muzuhu - COMMIPHORA AFRICANA
muzuli - MILICIA EXCELSA
mvele vele - STROPHANTHUS EMINII
mveli veli - STROPHANTHUS EMINII
mvilu - VANGUERIA INFAUSTA
mvingayakale - STROPHANTHUS EMINII
mviru - VANGUERIA INFAUSTA
mviru - VANGUERIA MADAGASCARIENSIS
mviu - VANGUERIA INFAUSTA
mvugala - ACACIA MELLIFERA
mvulambula - ENTADA ABYSSINICA
mvule - MILICIA EXCELSA
mvuli - MILICIA EXCELSA
mvumbamvula - RAUVOLFIA CAFFRA
mvumo - FICUS THONNINGII
mvungwa - KIGELIA AFRICANA
mvungwe - KIGELIA AFRICANA
mvyo-vyo - STROPHANTHUS EMINII
mwaisonga - EUPHORBIA CANDELABRUM
mwajaji - CROTON MEGALOCARPUS
mwajinde - DALBERGIA MELANOXYLON
mwaka - ALLANBLACKIA STUHLMANNII
mwalanga - HAGENIA ABYSSINICA
mwale - MILICIA EXCELSA
mwaliganza - ACACIA ALBIDA
mwaliganza - ACACIA TORTILIS
mwamba ngoma - COMMIPHORA EMINII
mwamba-ngoma - ERYTHRINA ABYSSINICA
mwanda - ADANSONIA DIGITATA
mwandu - ADANSONIA DIGITATA
mwandu - EUPHORBIA CANDELABRUM
mwanga - FLACOURTIA INDICA
mwanga - HAGENIA ABYSSINICA
mwanga - PERICOPSIS ANGOLENSIS
mwangati - JUNIPERUS PROCERA
mwanya - TERMINALIA SERICEA
mwanzi - OXYTENANTHERA ABYSSINICA
mwao - ACACIA POLYACANTHA
mware - LONCHOCARPUS CAPASSA
mwarinyani - PODOCARPUS LATIFOLIUS
mwaru - BRIDELIA MICRANTHA
mwasa - EUPHORBIA CANDELABRUM
mwasi, utupa - EUPHORBIA TIRUCALLI
mwasya - SYZYGIUM GUINEENSE
mwatatsi - TECLEA NOBILIS
mwavai - TRICHILIA EMETICA
mwawa - KHAYA ANTHOTHECA
mwawong - OCOTEA USAMBARENSIS
mweda - ACACIA XANTHOPHLOEA
mwede - ACACIA SIEBERANA
mwefu - TREMA ORIENTALIS
mwegambura - ENTADA ABYSSINICA
mwegea - KIGELIA AFRICANA
mwelewele - STROPHANTHUS EMINII
mwemba - FAUREA SALIGNA
mwembe mwitu - RAUVOLFIA CAFFRA
mwembenyigo - PODOCARPUS LATIFOLIUS
mwenba - FAUREA SALIGNA
mwenbinyigo - PODOCARPUS LATIFOLIUS
mwenge, mlama - COMBRETUM MOLLE
mwerera - ACACIA XANTHOPHLOEA
mweretsi - HAGENIA ABYSSINICA
mweretzi - HAGENIA ABYSSINICA
mweri weri - STROPHANTHUS EMINII
mwesa - BRIDELIA MICRANTHA
mwese wese - STROPHANTHUS EMINII
mwesi - TREMA ORIENTALIS
mwesu - TREMA ORIENTALIS
mweti - RAUVOLFIA CAFFRA

mweupe, mkole - GREWIA BICOLOR
mweupe, mtalala - SYZYGIUM CORDATUM
mweusi - ACACIA DREPANOLOBIUM
mweza - BRIDELIA MICRANTHA
mwezi - TREMA ORIENTALIS
mwicha - KIGELIA AFRICANA
mwiliweli - STROPHANTHUS EMINII
mwiluti - PRUNUS AFRICANA
mwimbe - RAUVOLFIA CAFFRA
mwingano - DICHROSTACHYS CINEREA
mwisa - BRIDELIA MICRANTHA
mwisya - BRIDELIA MICRANTHA
mwitu, mwembe - RAUVOLFIA CAFFRA
mwitu, mzambarau - SYZYGIUM GUINEENSE
mwitu, nyembe - TRICHILIA EMETICA
mwiuti - PRUNUS AFRICANA
mwiveli - STROPHANTHUS EMINII
mwiwa-nonya - BRIDELIA MICRANTHA
mwiwi - ADANSONIA DIGITATA
mwiza - BRIDELIA MICRANTHA
mwoma - DALBERGIA NITIDULA
mwuli - MILICIA EXCELSA
mwumo - FICUS THONNINGII
mwuwiye - ADANSONIA DIGITATA
myenze - BRACHYSTEGIA BOEHMII
myenzeyenze - ALBIZIA GUMMIFERA
myigeya - KIGELIA AFRICANA
myofu - KHAYA ANTHOTHECA
myombo - BRACHYSTEGIA BOEHMII
myombo - BRACHYSTEGIA BUSSEI
myombo - BRACHYSTEGIA SPICIFORMIS
myuguyugu - BALANITES AEGYPTIACA
myuyu - MARKHAMIA OBTUSIFOLIA
mzambarai - SYZYGIUM GUINEENSE
mzambarao - SYZYGIUM CORDATUM
mzambarau mwitu - SYZYGIUM GUINEENSE
mzarabo - SYZYGIUM GUINEENSE
mzati - SYZYGIUM CORDATUM
mzengute - KIGELIA AFRICANA
mzenzati - ENTADA ABYSSINICA
mzeze - SYZYGIUM CORDATUM
mzieghembe - OLEA EUROPAEA
mzima - TERMINALIA SERICEA
mzimdiwi - BRACHYSTEGIA SPICIFORMIS
mzinga-zinga - CORDIA AFRICANA
mzingute - KIGELIA AFRICANA
mziregembe - OLEA EUROPAEA
mzombo - BRACHYSTEGIA SPICIFORMIS
mzule - MILICIA EXCELSA
mzululwa - CROTON MACROSTACHYUS
namamwela - COMBRETUM MOLLE
naamo - COMMIPHORA AFRICANA
naamo - COMMIPHORA EMINII
nafumo - BRACHYSTEGIA BOEHMII
nafumo - BRACHYSTEGIA SPICIFORMIS
naganagachan - COMBRETUM MOLLE
nanda - ACACIA ALBIDA
narmo - ACACIA XANTHOPHLOEA
nary - ACACIA XANTHOPHLOEA
nasichand - BOSCIA MOSSAMBICENSIS
nasojan - OLEA CAPENSIS
natal mahogany - TRICHILIA EMETICA
ndagula - BRACHYSTEGIA SPICIFORMIS
ndaria - VANGUERIA INFAUSTA
ndawiro - VANGUERIA MADAGASCARIENSIS
ndelamwana - LANNEA SCHWEINFURTHII
nderakwa - JUNIPERUS PROCERA
ndola - FICUS THONNINGII
ndowo - VANGUERIA MADAGASCARIENSIS
nduo - SOLANUM INCANUM
nduradura - ACACIA DREPANOLOBIUM
nduruka - ALBIZIA SCHIMPERANA
neemo - COMMIPHORA AFRICANA
ng' wandu - ADANSONIA DIGITATA
ng'weeti - RAUVOLFIA CAFFRA
ngeba - MARKHAMIA OBTUSIFOLIA
ngembi - DALBERGIA MELANOXYLON
ngeregere - ACACIA NILOTICA
ngivavi - HAGENIA ABYSSINICA
ngoma - COMMIPHORA EMINII
ngoma, mwamba- - ERYTHRINA ABYSSINICA
ngovigovi - FLACOURTIA INDICA
nguluka - SYZYGIUM GUINEENSE
ngwicha - KIGELIA AFRICANA
niimo - COMMIPHORA AFRICANA
niimo - COMMIPHORA EMINII
njavokalia - RAUVOLFIA CAFFRA
njombe - FICUS SYCOMORUS
nkola - AFZELIA QUANZENSIS
nkolo - SYZYGIUM GUINEENSE
nkuba-nghubi - LONCHOCARPUS CAPASSA
nkubangubi - LONCHOCARPUS CAPASSA
nkuma - RAUVOLFIA CAFFRA
nkuro - OCOTEA USAMBARENSIS
nkwaati - TECLEA NOBILIS
nmali - LONCHOCARPUS CAPASSA
noge - JUNIPERUS PROCERA
nruka - ALBIZIA SCHIMPERANA
nsana - COMBRETUM ZEYHERI
nsayu - LANNEA SCHWEINFURTHII
nsebi - OCOTEA USAMBARENSIS
nsese - FAUREA SALIGNA
nshishi - TAMARINDUS INDICA
nso - JUNIPERUS PROCERA
ntalla - UAPACA KIRKIANA
ntondoo - KHAYA ANTHOTHECA
ntula - SOLANUM INCANUM
nuki - PODOCARPUS LATIFOLIUS
nyaalasi - KHAYA ANTHOTHECA
nyahumbu - BERCHEMIA DISCOLOR
nyakyusambula, mbula - PARINARI CURATELLIFOLIA
nyalulasi - PODOCARPUS LATIFOLIUS
nyamate - CORDIA SINENSIS
nyamfunga - DALBERGIA MELANOXYLON
nyamfunza - DALBERGIA MELANOXYLON
nyawera - STROPHANTHUS EMINII
nyembe mwitu - TRICHILIA EMETICA
nyijiva - BALANITES AEGYPTIACA
nyuguyu - BALANITES AEGYPTIACA
nzakala we mwana - DIOSPYROS MESPILIFORMIS
nziloi - CROTON MEGALOCARPUS
nzungwa - KIGELIA AFRICANA
o remit - SALVADORA PERSICA
olti - ACACIA MELLIFERA
oitlaska - DALBERGIA MELANOXYLON
okoo - BERCHEMIA DISCOLOR

ol aile - EUPHORBIA TIRUCALLI
olama - XIMENIA AMERICANA
ol amai - XIMENIA AMERICANA
olasili - ACACIA POLYACANTHA
olbukoi - COMBRETUM MOLLE
olbukoi - TERMINALIA SERICEA
ol chapukaiyan - RAUVOLFIA CAFFRA
oldaboi - KIGELIA AFRICANA
ol darakwa - JUNIPERUS PROCERA
ol darboi - KIGELIA AFRICANA
oldepasi - ACACIA TORTILIS
oldepesi - ACACIA TORTILIS
ol durgo - CORDIA SINENSIS
ol durogo - CORDIA SINENSIS
ol garian - FAUREA SALIGNA
ol geturai - ALBIZIA GUMMIFERA
ol gnangobli - FICUS SYCOMORUS
ol gujuk - PRUNUS AFRICANA
olerai - ACACIA TORTILIS
olerai - ACACIA XANTHOPHLOEA
olgiloriti - ACACIA NILOTICA
olgorete - ACACIA TORTILIS
olimisera - ADANSONIA DIGITATA
olive, brown - OLEA EUROPAEA
olive, elgon - OLEA CAPENSIS
olive, wild - OLEA EUROPAEA
oljabokalyan - RAUVOLFIA CAFFRA
ol kijabe - HAGENIA ABYSSINICA
olkiloriti - ACACIA NILOTICA
olkionite - ACACIA NILOTICA
olkoinye - EUCLEA DIVINORUM
olkonjuku - PRUNUS AFRICANA
oltaleroi - FLACOURTIA INDICA
ol madanyi - VANGUERIA MADAGASCARIENSIS
ol mangulai - FICUS SYCOMORUS
olmangulai-oloing'oni - GREWIA PLATYCLADA
ol marbait - CROTON MEGALOCARPUS
ol margait - CROTON MEGALOCARPUS
olmaroroi - COMBRETUM MOLLE
olmaroroi - COMBRETUM ZEYHERI
olmarubai - CROTON MEGALOCARPUS
ol masembrai - TAMARINDUS INDICA
olmasi - OLEA CAPENSIS
ol matate - TREMA ORIENTALIS
ol mergoit - CROTON MEGALOCARPUS
olmesera - ADANSONIA DIGITATA
ol mesigei - RHUS NATALENSIS
olmsogoni - WARBURGIA SALUTARIS
ol nanboli - FICUS SYCOMORUS
oing'aboli - FICUS VALLIS-CHOUDAE
oing'oswa - BALANITES AEGYPTIACA
oing'weng'wenyi - ACACIA GERRARDII
oingaboli - ERYTHRINA ABYSSINICA
oingaboli - FICUS SYCOMORUS
olobiago - CROTON MACROSTACHYUS
oloboni - ERYTHRINA ABYSSINICA
ol oliondoi - OLEA EUROPAEA
oloi orieni - OLEA EUROPAEA
ololle - EUPHORBIA TIRUCALLI
oloiyapiyap - CROTON MACROSTACHYUS
ololiapo - CROTON MACROSTACHYUS
ololiondoi - OLEA CAPENSIS
oloiyapiyapi - CROTON MACROSTACHYUS
olorieni - OLEA EUROPAEA
olowani - ERYTHRINA ABYSSINICA
olperelong'o - ALBIZIA HARVEYI
ol sanguuwezi - ALBIZIA GUMMIFERA
olsanguwesi - ALBIZIA SCHIMPERANA
ol tarakwa - JUNIPERUS PROCERA
oltatakwai - JUNIPERUS PROCERA
oltiaska - DALBERGIA MELANOXYLON
omosaruwa - LANNEA SCHWEINFURTHII
omugu - ACACIA POLYACANTHA
omuhohwe - TREMA ORIENTALIS
omuhuwe - TREMA ORIENTALIS
omunazi - PARINARI CURATELLIFOLIA
omushesho - RHUS NATALENSIS
omuzo - TECLEA NOBILIS
orbochandi - LANNEA SCHWEINFURTHII
oreteti - FICUS THONNINGII
orieni, oloi - OLEA EUROPAEA
ormatoo - AZANZA GARCKEANA
ormelelek - ACACIA LAHAI
ormisigiyoi - RHUS NATALENSIS
orokutuno - SYZYGIUM CORDATUM
orpiripiri - PODOCARPUS LATIFOLIUS
orrolmo - VITEX DONIANA
os siteti - GREWIA BICOLOR
osanguoisi - ALBIZIA PETERSIANA
osangupesi - ALBIZIA GUMMIFERA
osangupesi - ALBIZIA PETERSIANA
osangupesi - ALBIZIA SCHIMPERANA
osilalei - COMMIPHORA AFRICANA
osilalei - COMMIPHORA TROTHAE
osimihhi - ALBIZIA PETERSIANA
osiminde - GREWIA BICOLOR
ositeti - GREWIA MOLLIS
osojoo - EUCLEA DIVINORUM
osonjoi - CASSIPOUREA MALOSANA
paperbark thorn - ACACIA SIEBERANA
peacock flower - ALBIZIA GUMMIFERA
pencil cedar, african - JUNIPERUS PROCERA
pepper-bark tree - WARBURGIA SALUTARIS
pigeonwood - TREMA ORIENTALIS
plains bamboo - OXYTENANTHERA ABYSSINICA
plum, black - VITEX DONIANA
plum, indian - FLACOURTIA INDICA
plum, mbola - PARINARI CURATELLIFOLIA
plum, large sour - XIMENIA CAFFRA
plum, small sour - XIMENIA AMERICANA
plum, wild - XIMENIA AMERICANA
pod - PODOCARPUS LATIFOLIUS
pod, wing - XERODERRIS STUHLMANNII
podo - PODOCARPUS LATIFOLIUS
poker tree, red-hot - ERYTHRINA ABYSSINICA
poyi - DALBERGIA MELANOXYLON
puguswa - FLACOURTIA INDICA
q'oya - DALBERGIA MELANOXYLON
qarbu - ACACIA DREPANOLOBIUM
quanquari - ERYTHRINA ABYSSINICA
quanquzi - ERYTHRINA ABYSSINICA
quarri, magic - EUCLEA DIVINORUM
quinine tree - RAUVOLFIA CAFFRA
rain tree - LONCHOCARPUS CAPASSA
red currant - RHUS NATALENSIS
red-hot-poker tree - ERYTHRINA ABYSSINICA

red mahogany - KHAYA ANTHOTHECA
red stinkwood - PRUNUS AFRICANA
red thorn - ACACIA GERRARDII
red thorn - ACACIA LAHAI
rubber hedge euphorbia - EUPHORBIA TIRUCALLI
saangati - ILEX MITIS
sagonai - WARBURGIA SALUTARIS
sahati - ALBIZIA GUMMIFERA
sahati - OLEA EUROPAEA
sahati - OLEA CAPENSIS
sahhati - OLEA EUROPAEA
saklana - FICUS SYCOMORUS
sambarau - SYZYGIUM GUINEENSE
sangetmo - BOSCIA MOSSAMBICENSIS
sangupesi - ALBIZIA PETERSIANA
sangupesi - ALBIZIA SCHIMPERANA
sanzavi - ACACIA TORTILIS
sapu - EUPHORBIA TIRUCALLI
sarai - ALBIZIA GUMMIFERA
sarakwi - TERMINALIA SERICEA
sasi - OLEA CAPENSIS
sausage tree - KIGELIA AFRICANA
scented thorn - ACACIA NILOTICA
sei - CORDIA AFRICANA
selemuka - JUNIPERUS PROCERA
semit - JUNIPERUS PROCERA
senefu - OLEA EUROPAEA
sengamino - BRIDELIA MICRANTHA
sengati - ILEX MITIS
sense - FAUREA SALIGNA
sese - FAUREA SALIGNA
sickle bush - DICHROSTACHYS CINEREA
sickle-leaved albizia - ALBIZIA HARVEYI
siegi - PODOCARPUS LATIFOLIUS
silver terminalia - TERMINALIA SERICEA
simbakigulu - SALVADORA PERSICA
singiati - ACACIA SIEBERANA
sinyanyi - EUCLEA DIVINORUM
siponda - COMMIPHORA AFRICANA
sirongi ambalung - RHUS NATALENSIS
siarakaha - TREMA ORIENTALIS
small-fruited teclea - TECLEA NOBILIS
small sourplum - XIMENIA AMERICANA
snot apple - AZANZA GARCKEANA
sokanay - WARBURGIA SALUTARIS
sokhaimo - FLACOURTIA INDICA
sonari - SYZYGIUM GUINEENSE
songajaye - HAGENIA ABYSSINICA
sori - ALBIZIA GUMMIFERA
sourplum, large - XIMENIA CAFFRA
sourplum, small - XIMENIA AMERICANA
soursop, wild - ANNONA SENEGALENSIS
staswa - FLACOURTIA INDICA
stinkwood, red - PRUNUS AFRICANA
strangler fig - FICUS THONNINGII
sungute - TRICHILIA EMETICA
sycamore fig - FICUS SYCOMORUS
syringa, wild - BURKEA AFRICANA
taswi - TRICHILIA EMETICA
tahhumo - ACACIA ALBIDA
tahhumo - ACACIA SIEBERANA
tamarind - TAMARINDUS INDICA
tambaragi - LANNEA SCHWEINFURTHII
tamumo mhembete - DALBERGIA MELANOXYLON
tarantu - XIMENIA AMERICANA
tawaso - PODOCARPUS LATIFOLIUS
telea, small fruited - TELEA NOBILIS
teteko - COMBRETUM ZEYHERI
tetekuriru - COMBRETUM MOLLE
thigii - LANNEA SCHWEINFURTHII
thogi - AZANZA GARCKEANA
thorn, black - ACACIA MELLIFERA
thorn, hook - ACACIA MELLIFERA
thorn, paperbark - ACACIA SIEBERANA
thorn, red - ACACIA GERRARDII
thorn, red - ACACIA LAHAI
thorn, scented - ACACIA NILOTICA
thorn, umbrella - ACACIA ABYSSINICA
thorn, umbrella - ACACIA TORTILIS
thorn, white - ACACIA POLYACANTHA
thorn, winter - ACACIA ALBIDA
tiita - FICUS THONNINGII
timbui timbui - XIMENIA AMERICANA
tlaghy - AZANZA GARCKEANA
tlaheri - ALBIZIA HARVEYI
tlahmo - ACACIA ALBIDA
tlangetimo - BOSCIA MOSSAMBICENSIS
tlehanimo - ALBIZIA HARVEYI
tlehhanimo - ACACIA ALBIDA
toothbrush tree - SALVADORA PERSICA
tope-tope - ANNONA SENEGALENSIS
tree entada - ENTADA ABYSSINICA
tree hibiscus - AZANZA GARCKEANA
tsalmo - OLEA CAPENSIS
tsantsafi - ACACIA TORTILIS
tsapenai - FLACOURTIA INDICA
tsaqayand - ACACIA NILOTICA
tsori - ALBIZIA GUMMIFERA
tuhalmo - ALBIZIA HARVEYI
tundulu - COMMIPHORA AFRICANA
tundwa - XIMENIA CAFFRA
tuungulemba - RAUVOLFIA CAFFRA
uduboguta - GREWIA PLATYCLADA
ukwezu - TAMARINDUS INDICA
ulula - ACACIA DREPANOLOBIUM
umsasazi - PARINARI CURATELLIFOLIA
umbrella thorn - ACACIA ABYSSINICA
umbrella thorn - ACACIA TORTILIS
umbula - PARINARI CURATELLIFOLIA
umubanga - PERICOPSIS ANGOLENSIS
unhungu - DALBERGIA NITIDULA
utupa mwasi - EUPHORBIA TIRUCALLI
utupa - EUPHORBIA TIRUCALLI
viru - VANGUERIA INFAUSTA
vitex - VITEX DONIANA
vulula - ACACIA DREPANOLOBIUM
vulula wapi - ACACIA DREPANOLOBIUM
wahari - TECLEA NOBILIS
wami - PRUNUS AFRICANA
warambu - DALBERGIA ARBUTIFOLIA
waterberry - SYZYGIUM CORDATUM
waterboom - SYZYGIUM GUINEENSE
waterpear - SYZYGIUM GUINEENSE
we mwana, nzakala - DIOSPYROS MESPILIFORMIS
white thorn - ACACIA POLYACANTHA
wild almond - BERCHEMIA DISCOLOR

wild bamboo - OXYTENANTHERA ABYSSINICA
wild custard apple - ANNONA SENEGALENSIS
wild fig, common - FICUS THONNINGII
wild loquat - UAPACA KIRKIANA
wild medlar - VANGUERIA INFAUSTA
wild olive - OLEA EUROPAEA
wild plum - XIMENIA AMERICANA
wild soursop - ANNONA SENEGALENSIS
wild syringa - BURKEA AFRICANA
wing pod - XERODERRIS STUHLMANNII
winterthorn - ACACIA ALBIDA
woodland waterberry - SYZYGIUM GUINEENSE
xaxabo - AZANZA GARCKEANA
yellow wood, east african - PODOCARPUS LATIFOLIUS
yudegi - ACACIA MELLIFERA
yudek - ACACIA MELLIFERA
zahhati - OLEA EUROPAEA
zebra wood - DALBERGIA MELANOXYLON
ziloi - CROTON MEGALOCARPUS



Acacia lehai

Cultural Survival Canada and Devlopment Services Foundation of Tanzania

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