

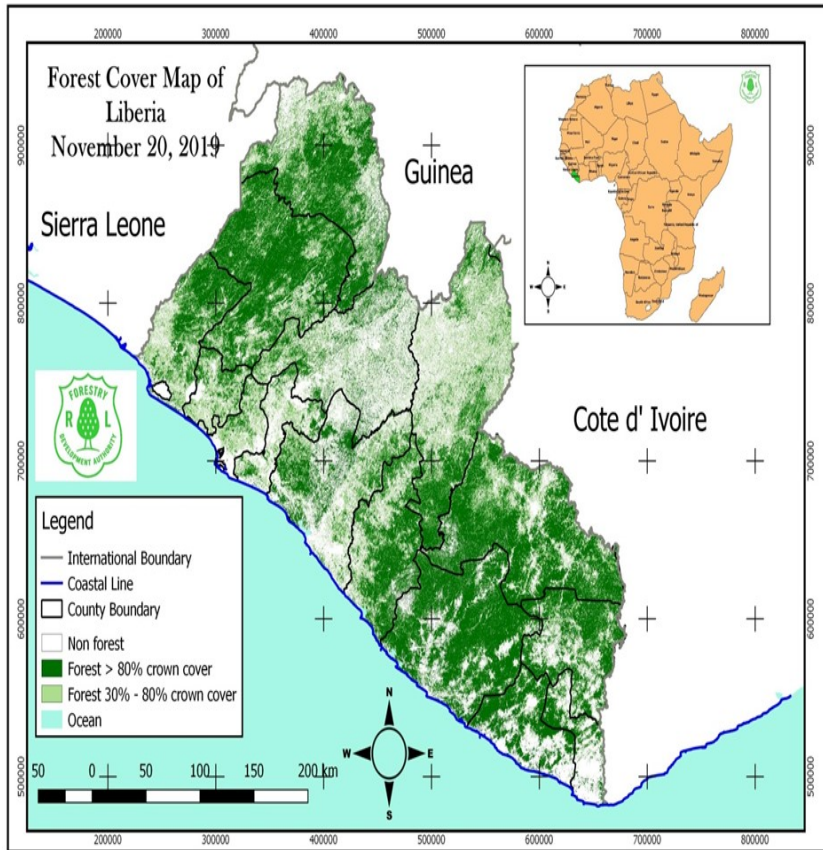
## THE TROPICAL TIMBERS OF LIBERIA



This production of this manual is part of the **“Building Capacities of Small-Medium Forest Enterprises (SMFEs) in Ghana and Liberia to Supply and Trade in Legal Timber”** project which was executed by the Nature & Development Foundation (NDF) and the Liberia Timber Association (LibTA) with funding from UK-Aid under the Forest Governance, Markets and Climate Programme (FGMC)



# VEGETATION MAP OF LIBERIA



Liberia Forest Resource map – METRIA AND GEOVILLE 2016

Courtesy of GIS Division of the Forestry Development Authority (FDA) of Liberia



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## ACRONYMS:

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ExCo	Executive Committee
FGMC	Forest Governance, Markets, and Climate
FDA	Forestry Development Authority
GoL	Government of Liberia
KWC	Kumasi Wood Cluster
LibTA	Liberia Timber Association
NDF	Nature & Development Foundation
NFRL	National Forest Reform Law
UFTI	Union Forestry Training Institute
VPA-SU2	Voluntary Partnership - Support Unit 2

Project Title: “**Building Capacities of Small-Medium Forest Enterprises (SMFEs) in Ghana and Liberia to Supply and Trade in Legal Timber**”

**Project Objective:** “To contribute to improved forest governance and promote legal timber trade in West Africa”

IMPLEMENTING PARTNERS: **Nature & Development Foundation (NDF)**  
**Liberia Timber Association (LibTA)**  
**Liberia Chainsaw Timber Dealers Union LICSATDUN)**  
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Kryn, J. M., & Fobes, E. W. (1959). The woods of Liberia (No. 2159). USDA, Forest Service, Forest Products Laboratory. Experiment Station.

Chudnoff, M. (1973). Physical, Mechanical, and Other Properties of Selected Secondary Species in Surinam, Peru, Colombia, Nigeria, Gabon, Philippines, and Malaysia. Office of Science and Technology Agency for International Development.

Reyes, G. (1992). Wood densities of tropical tree species (Vol. 88). US Department of Agriculture, Forest Service, Southern Forest Experiment Station.

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Head of Secretariat  
The Technical Secretariat  
**Liberia Timber Association (LibTA)**

## INTRODUCTION

The descriptive text and data presented in this manual have been freely collected from numerous credible sources and compiled for usage by member companies of LibTA as well as the wider public, inside and outside of Liberia.

This manual contains concise, but comprehensive and in-depth information that encourages the optimum use of the sixty-five (65) commercial timber tree species listed in schedule one of the 2007 Ten Code Regulation of the Forestry Development Authority (FDA) of Liberia.

The information includes technical descriptions (weight, natural durability, strength, shrinkage, movement in service, indication of forest availability, working properties, historical production volumes, principal end use, as well as the product groups, and an index of botanical and common/ trade name of individual wood timber species.

The information contained herein is a compilation of data from all available resource materials on the various woods of not only Liberia but also of West Africa and other tropical and non-tropical countries that appeared in a number of publications, and in different languages. Therefore, this manual represents considerable time and efforts in locating, translating, and, wherever possible, converting data to the required units.

While the manual focuses primarily on the sixty-five (65) commercial timber species, it is important to note that at the moment only about fifteen (15) of these listed species are frequently being harvested and exported, while the other fifty (50) species are yet to be exploited.

Species description in this manual is listed in alphabetical order by genus.

## SOURCES OF INFORMATION

Ayensu, E. S., & Bentum, A. (1974). Commercial timbers of West Africa. Smithsonian Contributions to botany

Ross, R. J. (2010). Wood handbook: wood as an engineering material. USDA Forest Service, Forest Products Laboratory, General Technical Report FPL-GTR-190, 2010: 509 p. 1 v., 190.

Green, D. W., Winandy, J. E., & Kretschmann, D. E. (1999). Mechanical properties of wood. Wood handbook: wood as an engineering material. Madison, WI: USDA Forest Service, Forest Products Laboratory, 1999. General technical report FPL; GTR-113: Pages 4.1-4.45, 113.

Kretschmann, D. (2010). Mechanical properties of wood. Wood handbook: wood as an engineering material: chapter 5. Centennial ed. General technical report FPL; GTR-190. Madison, WI: US Dept. of Agriculture, Forest Service, Forest Products Laboratory, 2010: p. 5.1-5.46., 190, 5-1.

[https://www.woodworkerssource.com/show\\_numerical.php?wood=Anopyxis%20klaineana](https://www.woodworkerssource.com/show_numerical.php?wood=Anopyxis%20klaineana): access August 19, 2020

Gérard, J., Guibal, D., Paradis, S., & Cerre, J. C. (2017). The tropical timber atlas. Pp. 651

Poorter, L. (Ed.). (2004). Biodiversity of West African forests: an ecological atlas of woody plant species. CABI. Pp.151

Voorhoeve, A. G. (1965). Liberian high forest trees (p. 416). Wageningen, The Netherlands: Centre for agricultural publications and documentation.

Kukachka, B. F. (1971). Properties of imported tropical woods (Vol. 125). US Forest Products Laboratory.

Reyes, G. (1992). Wood densities of tropical tree species (Vol. 88). US Department of Agriculture, Forest Service, Southern Forest Chudnoff, M. (1984). Tropical timbers of the world (No. 607). US Department of Agriculture, Forest Service.

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
61	Tetraberlinia tub-maniana	Sikon, Gola (Liberia)
62	Tieghemella heckelii	Baku (Ghana), Makoré (Ivory Coast); Douka, Ukola (Gabon)
63	Triplochiton scleroxylon	Bado, M'bado (CAR), Eguess (Congo), Ayous, Ayus (Equatorial Guinea), Ayous/ Obeche (Garbon, Xwetin (Benin), Arere, Obeche (Nigeria), Samba (Ivory Coast), Ayous (Cameroon), Wawa (Ghana), Abachi (Germany, Holland)
64	Turraeanthus africanus	Blima-pu (Liberia), Avodire (Ivory Coast), Asama (Cameroon), Apapaya, Avodire (Ghana), Apaya (Nigeria), Lusamba, M'fube (DRC)
65	Uapaca guinensis	Abo emido, Yeye (Nigeria), Rikio, Borikio, Rikio rivièrè (Ivory Coast, Cameroon), Sugar plum

## LIBERIA'S FOREST RESOURCE BASE

Liberia is situated within the Upper Guinean Forest that extends from Guinea at the north western extreme to the eastern limit in Cameroon. The Upper Guinean Forest is fragmented and Liberia accounts for about 42% of West Africa's remaining tropical forest.

The total Liberian land area is 9.6 million ha, of which forests cover about 45% or 4.39 million ha. About half of the forest area is classified as **closed dense forest** (2.42 million ha); 1.02 million ha account for **open dense forest** and nearly 1 million ha (0.95) is **agriculture degraded forest** while about 1.3 million ha is under **mixed agriculture activities** (USAID, 2013; EPA, 2013).

There are three general types of forest in Liberia, 1) the **semi deciduous moist forests** of western Liberia where there is a distinct dry season (under 100 mm rain/month), 2) the **wet evergreen forest** of eastern Liberia where the dry season is very short or absent and 3) the **sub-montane or montane forest** about 800 - 1000 m above sea level; although this zone is poorly-differentiated from the contiguous lowland forests. The highest hills in Liberia support this third forest type. An extensive zone of degraded forest occurs near the coast and extends inland in central Liberia, separating the moist and wet forest blocks.

The coastal zone is heavily impacted by settlements and agriculture, with a mosaic of sandy and rocky shores, mangroves and fresh-water swamps, grass/ shrub savannas on sand, and coastal forests. (USAID, 2013).

The New Forest Reform Law (NFRL 2006) places a premium on conservation and community forestry. There currently exist seven (7) Forest Management Contracts (FMC), ten (10) Timber Sale Contract (TSC), and twenty-three (23) Community Forest Management Agreements (CFMA). The combined accumulative areas of the above forty (40) contracts accounts for 1,342,977.46896 hectares ( 3,357,443.6724 acres).

Both FMC and TSC are subject to certification of concession allocation requirements with FDA while the CFMA are subjected to either logging contract, research or other uses as may be deem necessary by the community for enhancing their social and economy welfare but with consent of the Forestry development Authority (FDA).

## THE TIMBERS OF LIBERIA

Liberia hosts a vast array of timber species within the Upper Guinea Forest Belt (UGFB). There are 2,900 flowering plants, 240 timber species some of whom are endemic to the country (CITES Appendix II, 2005). Of the 240 timber species, at least 75 with smaller associate species of their family were identified by A.G Voorhoever (Liberia High Forest Trees, 1965) and follow by Carel Jongking and Hawthorn who also identified numerous other woody species (Woody Plants of Western African forests, 2006).

Currently, sixty-five (65) of these species have been classified by the FDA as being commercially important in recognition of the various end uses of wood; majority of whom includes, constructions, decking, dowels, furniture, paneling, fixtures, decoration, boxwood and carving.

Species distribution in Liberia is however associated with the major forest zones of the country though some species are found almost in all forest parts of Liberia. The intact forest comprised two main blocks: 1) **a southeastern block** of very wet evergreen forest and 2) **a drier, Upper-Guinean moist evergreen and semi-deciduous forest** in the northwest.

Characteristic species of the moist evergreen forests are *Lophira alata*, *Heritiera utilis* and *Sacoglottis gabonensis*, while *Meliaceae* (one of the most important timber families in West Africa) is represented by these species: *Lovoa trichilioides*, *Guarea cedrata* (bossé), *Khaya anthotheca* (khaya), *Entandrophragma candollei* (kosipo), etc.

The semi-deciduous forests cover the northern half of the country and contain a higher representation of almost all of the families; *Meliaceae*, *Fabaceae*, *Sterculiaceae* etc. the characteristic species being *Nesogordonia papaverifera* (danta), *Aningeria robusta*, *Didelotia idea* (bundu, did), *Piptadeniastrum africanum* (dahoma, dabema). Common shade-intolerant species are *Albizia* spp, *Fagara* spp, *Terminalia* spp and *Pycnanthus angolensis*.

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
52	<i>Parkia bicolor</i>	Parcia, Fava bolota, Faverira, Auarango, Rayo, Tangama, Uya, Cascaron, Kwatakama
53	<i>Pericopsis elata</i>	Afromosia, Kokrodua (Ghana), Assamela (Ivory Coast), Obang (CAR), Obang (Cameroon)
54	<i>Piptadeniastrum africanum</i>	Dahoma, Mbeli (Liberia), Dabéma (Ivory Coast), Dahoma (Ghana), Agboin, Ekhimi (Nigeria), Atui (Cameroon), Bokungu (Zaire), Mpewere (Uganda)
55	<i>Pterygota macrocarpa</i>	Kyere, Awari, Okyere (Ghana), Koto (Ivory Coast), Poroposo, Kefe (Nigeria), Efoke ayu (Cameroon), Ake (Gabon), Ofete (Benin), Kakende (CAR), Ikame (DRC)
56	<i>Pycnanthus africanus</i>	Gboyei (Sierra Leone) Bassa Wishmore, Gboyei, Ilomba (Liberia), Akoua, Oualélé, Walele (Ivory Coast), Akomu (Nigeria), Angonga, Eteng (Cameroon), Aprozuma, Otie (Ghana), Ongabili (Gabon), Gongu (CAR), N'gongo (Angola), Mugongo (DRC), Anguekong (Equatorial Guinea)
57	<i>Rhodoglyphalton brevicuape</i>	
58	<i>Sacoglottis gabonensis</i>	Akouapo, Toughi (Ivory Coast), Atala, Tala, Ugu (Nigeria), Bedwa, Bidou, Bodoua (Cameroon), Essoua, Ozouga (Gabon), Ozouga (Ghana), Kpowuli (S/ Leone)
59	<i>Terminalia ivorensis</i>	Black Afara, Idigbo (Nigeria), Emeri (Ghana), Framiré (Ivory Coast)
60	<i>Terminalia superba</i>	Ofram (Ghana), Fraké (Ivory Coast), Afara (Nigeria), Akom (Cameroon), Limba (Zaire, Angola). "Korina" a trade name in the U.S.A.



S/N	BOTANICAL NAME	COMMON/ TRADE NAME
44	Lovoa trichilioides	Mpengwa (Ghana), Anamemila, Apopo, Sida (Nigeria), Bombulu (Zaire), Dibétou (Gabon, Ivory Coast), Congowood, Tigerwood (USA), Lovoa, Apopo, ida, African walnut, temariri
45	Mammea Africana	Bompegya (Ghana), Kaikumba/Oboto (Liberia, Sierra Leone), Ologbomodu (Nigeria), Aborzok (Cameroon), Bokoli (Zaire)
46	Mansonia altissima	Aprono (Ghana), Bété (Ivory Coast), Ofun (Nigeria), Koul (Cameroon)
47	Nauclea diderrichii	Kusia (Ghana), Badi (Ivory Coast), Bilinga (Gabon), Akondoc (Cameroon), N'Gulu-maza (Zaire), Kilingi (Uganda)
48	Nesogordonia papperifera	Kotibé (Ivory Coast), Otutu (Nigeria), Owoé (Cameroon), Arborbora (Gabon), Kondofindo (Zaire), Naouya (Angola), Abumana, Akumaba, Epro (Ghana)
49	Oldfieldia Africana	Dantoure (Ivory Coast), Kpaoli, Pauli (Liberia), Kpaoli, Pauli, Turtosa (S/Leone)
50	Ongokea gore	Kouéro (Ivory Coast), Andjek, Angueuk (Gabon, Cameroon), Boleko (Zaire)
51	Parinari excels	Sougue (Ivory Coast), Kpar (Liberia), Eshago, Inyi (Nigeria), Mubura (Uganda), Mampata (Senegal), Mula (Tanzania)
52	Parkia bicolor	Parcia, Fava bolota, Faverira, Auarango, Rayo, Tangama, Uya, Cascacon, Kwatakama

## LIBERIA TIMBER INDUSTRY

During the crisis period of Liberia (1990 – 2003), the stability and sustainability of the logging sector was threatened by procedural flaws such as exception/exemption procedures for inappropriate forestry activities, the granting of special favors, and forest crimes including timber theft, corruption and illegal logging. Indeed, log exports were known to be used as a source of funding for private militias, thereby prolonging the civil war. As a result of international concern over this issue, the UN Security Council passed its resolution 1478 calling on all member states to ban imports of round logs and timber products from Liberia for ten months from July 2003. The import ban was subsequently extended and remained in place as of December 2005; thereby requesting the reform of the sector before the lifting of said sanction.

As a result of this demand, the National Forest Reform Law (NFRL) was crafted in 2006 followed by several legal instruments, requirements and regulations with the aim of curtailing the use of forest revenue to fuel conflict in the Sub-Region as well as other malpractices in the sector which benefited a few among the rest of the masses.

With this agenda in mind, the government contracted the organization, Society De' General Surveillance (SGS) to the run the chain of custody under the system LiberFor, later, LiberTract and now LiberTrace which is currently control by the Legality Verification Department (LVD) of the Forestry Development Authority (FDA). These entity works mainly focus on ensuring the implementation of certify logging activities void of discrepancies in accordance with international criteria of forest accreditation for acceptance of its products at international wood markets and at an attractive purchasing options.

Today, the forest sector is governed by the three C's, policy - Conservation, Community and Commercial forestry. In fact, prior to the civil conflict, commercial forestry was the only focus of the FDA; however, the NFRL of 2006 put more premiums on conservation and community forestry. Meanwhile, and based upon the high demand for timbers to certify domestic construction purposes and other end uses of wood, CFMA and chain-saw operations ( a necessary evil) is on the increase in order to maintain a steady flow of timbers on the local markets.

Acquisition of Forest Management Contract (FMC) and Timbers Sale Contract (TSC) are cost intensive considering the various processes to certify before the granting of such concessions to an investor. Many local partners of the sector are having difficulties to immediately invest in the sector due to the heavy financial implication involved.

Given the above prevailing circumstances unfolding in the sector, there are currently seven (7) registered Forest Management Contract (FMC), ten (10) Timbers Sale Contract (TSC) and twenty-three (23) Community Forest Management Agreements (CFMA) which give us an average of 42 companies ( GIS FDA 2020, LiberTrace 2020).

Production data over the period 2010 – 2014 amounted to 259,354m<sup>3</sup> of logs and 41,200 bundles of sawn wood which account for domestic consumption while 56,856m<sup>3</sup> of logs and 1,030 bundles of sawn wood were exported by shipping companies (ITTO MIS, 2014). Recent statistical data over the period of 2016- 2020 of round logs exportation amounted to 32,928.46M<sup>3</sup> derived from an accumulative volumes of 63,927 logs while sawn wood amounted to 3,972.206M<sup>3</sup> also an accumulative volumes of 3,528 bundles (FDA, LVD 2020).

These figures show a sharp decline in volumes of harvest and exportation especially over a period of five years; thus, giving an indication also on the decline of revenues generation. This occurrence, we believe must be due to a slack in active operations or COVID 19 which have cause a temporary closure of many companies or perhaps, other management requirements.

Besides, views emanating from the corridor of the sector expressed a dire need to revisit the NFRL of 2006 in order to amend or adjust some of its accompanying regulations and criteria, most of whom have place a down pinning strings on the growth and viability of the sector.

The above suggestion, if undertaken, will provide a lead way in facilitating the booming of the sector thereby encouraging Investors; given the major role of the sector as one of the key revenue generating arm of the government in furtherance of its development agenda.

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
34	Guarea cedrata	Bossé (Ivory Coast), Kwabohoro (Ghana), Obobo (Nigeria), Édoucié (Cameroon)
35	Guibourtia ehie	Ehie, Anokye (Ghana), Amazoué, Amazakoue (Ivory Coast), Essingang (Cameroon), Ovang, Kevazingo (Gabon), Waka (Zaire), Bubinga
36	Hallea ciliate (Mitragyna ciliate)	M'Boy (Sierra Leone, Liberia), Bahia (Ivory Coast), Baya, Subaha (Ghana), Elolom (Cameroon), Elelom (Gabon), Vuku, M'Voukou (Zaire), Nzingu (Zambia, Uganda), Abura; Poplar (commonly used in Liberia)
37	Hannoa klaineana	Hannoa (Effeu)
38	Haplormosia macrophylla	Black gum (Liberia), Dinankrohia, Larme (Ivory Coast), Idewa (Gabon), Akoti (Nigeria)
39	Heritiera utilis	Niangon (Côte d'Ivoire), Ogoue (Gabon), Niangon, Nyankom (Ghana), Whismore (Liberia), Yami (S/ Leone)
40	Khaya anthotheca	Munyama (Uganda), Acajou d'Afrique (Ivory Coast), Dubini, Dukuma fufu (Ghana), Ogwango (Nigeria), Acajou-blanc, Khaya
41	Khaya ivorensis	Munyama (Uganda), Acajou d'Afrique (Ivory Coast), Dubini, Dukuma fufu (Ghana), Ogwango (Nigeria)
42	Klainedoxa gabonensis	Kroma (Ivory Coast), Odudu (Nigeria), Mututtu (Uganda)
43	Lophira alata	Bongossi, Bakundu (Cameroon), Kaku (Ghana), Esore (Ivory Coast), Aba (Nigeria), Endwi (Sierra Leone), Azobe or ekki, Iron wood

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
24	<i>Didelotia idea</i>	Bondu (Liberia), Angok, Towe (Gabon), Ekop-gombe, Combe (Cameroon), Timba (S/ Leone), Broutou, Toubaouate (Ivory Coast)
25	<i>Distemonanthus benthamianus</i>	Barré (Ivory Coast), Bonsamdua (Ghana), Eyèn (Cameroon), Ayanran (Nigeria), Movingui, (Gabon) Monkey can't Climb
26	<i>Entandrophragma angolense</i>	Mukusu (Uganda), Tiama (Ivory Coast), Edinam (Ghana), Acuminata, Livuite (Angola), Abeba (Cameroon), Gedu nohor (Nigeria), Lifaki, Vovo (DRC), Dongomanguila (E. Guinea), Abeubegne (Gabon)
27	<i>Entandrophragma candollei</i>	Omu (Nigeria), Candollei (Ghana), Kosipo (Liberia)
28	<i>Entandrophragma cylindricum</i>	Aboudikro (Ivory Coast), Penkwa (Ghana), Muyovu (Uganda), Sapelli (Cameroon), Libuyu (Zaire)
29	<i>Entandrophragma utile</i>	Efuodwe (Ghana), Sipo (Ivory Coast), Okeong (Nigeria), Assié (Cameroon), Kosi-Kosi (Gabon), Mufumbi (Uganda)
30	<i>Erythrophleum ivorensis</i>	Tali (Ivory Coast), Erun, Sasswood (Nigeria), Potrodom (Ghana), Kassa (Zaire), Muave (Zambia), Mwavi (Tanzania), Sasswood tree (general use)
31	<i>Fagara macrophylla</i>	Olon dur (Gabon), Munyenye (Uganda), Fagara (Liberia)
32	<i>Funtumia elastic</i>	Mutundu, rubber tree, Lagos silk rubber
33	<i>Gilbertiodendron preussii</i>	African oak, Red oak (generally used at sawmills), limbali

## **PART ONE: DATA SHEET EXPLANATORY NOTES**

### **SCIENTIFIC NAME**

Scientific name currently being used by botanists

### **SPECIES CODE**

A system of letters used to represent the botanical name of tree species in a short or more convenient way

### **FAMILY NAME**

Botanical family to which one or more species belong

### **COMMON/ TRADE NAME**

The most common name used in national and international trade

### **SPECIES DISTRIBUTION**

Provides information on growth ranges of individual tree species

### **WORKING PROPERTY**

The ability of the wood to work easily with hand and machine tools, tendencies to torn or chipped grain, smoothness of finish cut, dulling of cutters, and ease of veneering, as well as nailing, screwing, or gluing characteristics; however, the descriptive information provided here are mostly subjective

## WEIGHT

The weight of a species is a broad indication of its performance. Lighter weight species are softer, less durable and less strong. Very heavy species can exhibit very high level of strength, natural durability and toughness. These characteristics assist in getting a general ideal of the nature of a species, the descriptions, and the average weight of that species under specific moisture content. In practice there is always a variation as some may be dried to 12 or 15% or more; but for the purpose of this manual, the density figures relate to 12% moisture content, i.e. they are the commonly called air-dry density values.

Criteria	Rating
<356 kg/m <sup>3</sup>	Very Light
357 – 557 kg/m <sup>3</sup>	Light
558 – 758 kg/m <sup>3</sup>	Moderately Heavy
759 – 959 kg/m <sup>3</sup>	Heavy
>960 kg/m <sup>3</sup>	Very Heavy

## INDICATION OF FOREST AVAILABILITY

Relative to the distribution of species in a particular geographical or climatic zone within Liberia, as some species can be found in all parts of the Country. However, indication of species availability in this Manual is based on the particular geographic location that the species can be found, and not the population density.

## USES

Refers to the suitability of a timber for particular applications. It should however be noted that the list of uses is not exhaustive; but it is merely to indicate the most important common purposes a particular species of wood is suitable.

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
18	Chrysophyllum spp	Kali, Mukali (Angola), Nom abam (Cameroon), Aniegre (Ivory Coast), Kararo (Ethiopia), Asanfena (Ghana), Mukangu, Muna (Kenya), Londojan (Nigeria), Osan (Uganda), M'boul (CAR), Tutu (DRC)
19	Combretodendron macrocarpum	Abalé (Ivory Coast), Owewe (Nigeria), Abing (Cameroon), Abin (Gabon), Minzu (Zaire)
20	Copaifera salikounda	Entedua (Ghana), Ovbialeke (Nigeria), Etimoe (Ivory Coast), Esak (Cameroon), Akpaflo (Benin), Andem-evine, Anzem noir (Gabon), Bilombi, Yama (CAR)
21	Cynometra Ananta	Apome (English), Nganga, Ekopnganga (Cameroon), Mkokom (Equatorial Guinea), Baraka, Wehu (DRC)
22	Daniella thurifera	Ogea, Ehyedua, Shedua (Ghana), Oziya, Daniellia (Nigeria), Faro, Ogea (Ivory Coast), Nsou (Cameroon), N'su (Equatorial Guinea), Jatin (Benin), Lonlaviol (Gabon), Bolengu (DRC), Gbessi (S/ Leone)
23	Dialium spp	Khleng (Thailand), Xoay, Kralanh (Cambodia), Kerandji (Indonesia)

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
11	Bombax buonopozense	Alone, Ogoumalanga (Gabon), Msufimwitu, Mfume (Tanzania), Meguza (Mozambique), Kapokier (Senegal), Esodoum (Cameroon), Kapokier (Congo), Kapokie, Oba (Ivory Coast), Kouria (Nigeria)
12	Brachystegia leonensis	Tebako (Liberia), Naga (France), Okwen (Nigeria), Bodgei (S/ Leone)
13	Calpocalyz aubrevillei	Badio (Calpocalyx)
14	Canarium schweinfurthii	Abel (Cameroon), Aiélé (Ivory Coast), Elemi (Nigeria), Bediwunua, Eyere (Ghana), Mwafu (Uganda) Aie'le', Bush candle stick
15	Ceiba pentandra	Fromager, Enia (Ivory Coast), Ngwe, Banda (Sierra Leone), Ghé (Liberia), Araba, Okha (Nigeria), Doum, Bouma, Odouma (Cameroon, Gabon), Fuma (Congo Rep), Ceiba; Cotton wood
16	Celtis spp (aldolfi-friederiei)	Esa (Ghana), Ba (Ivory Coast), Akasinsa (Uganda), Ita, Ohia (Nigeria), Mrinde, Mrunde (Tanzania)
17	Chlorophora spp (regia, excels)	Semli (Sierra Leone, Liberia), Odoum (Ghana, Ivory Coast), IRoko, Oroko (Nigeria), Abang, Mandji (Cameroon, Gabon), Mereira (Angola), Kambala (Zaire), Mvule (East Africa)

## NATURAL DURABILITY

**Natural Durability:** Wood is a natural polymer consisting primarily of cellulose, hemicellulose and lignin in a matrix that provides some resistance against microbial attack. Hence, the natural durability in this manual refers to the resistant of heartwood in contact with the ground against biodegradation such as fungal decay and insect attacks without the application of preservatives.

Durability Class	Description
> 10 years	highly durable
7 – 10 years	Durable
5 – 7 years	moderately durable
2 – 5 years	slightly durable
0 – 2 years	Non-durable

Please note that the extreme test conditions of total open at exposure in contact with the ground may be more other than longer life expectancy of well-designed and maintained exterior components in actual buildings. This classification indicates resistance to insects, termites, fungi and other borers attack.

## HISTORICAL PRODUCTION VOLUMES (M3)

This section gives relative commercial production volumes of individual species at specific time period, and based on market demand. Note: All species in this Manual that are considered as frequently harvested and exported are the ones for which the total number of logs exported amount to 100 pieces.

Information here is based on logs harvested between January, 2016 to August, 2020

## STRENGTH

The strength of a species can be determined by various criteria including stiffness, compression parallel to grain, resistance to impact and bending. Strength is also related to moisture content and presence of defects. This manual bases assessment on the general strength of a species by its density.

A good indicator of a wood's strength is its density - the weight for a given volume. This is measured by its specific gravity - the weight of a volume of wood divided by the weight of the same volume of water. Generally, the higher the ratio, the denser and stronger the wood. Henceforth, our classification of the species strength is determined by its density expressed in pound per cubic feet and converted to kilogram per cubic meters. However, the classification presented is indicative only and not for the purposes of calculation of working stresses. In the case where forms of laminations are used - for example in plywood, fingers jointing and laminated beams - strength properties are usually improved because the influence of defects is improved.

Category of Strength as per density express in  $\text{kg/m}^3$

Density Modulus(pcf)	KG/ M <sup>3</sup>	Strength Modulus
20 - 29	320 $\text{kg/m}^3$ - 464 $\text{kg/m}^3$	Weak
30 - 39	480 $\text{kg/m}^3$ - 624 $\text{kg/m}^3$	Medium
40 - 55	640 $\text{kg/m}^3$ - 880 $\text{kg/m}^3$	Moderately strong
56 - 62	900 $\text{kg/m}^3$ - 1000 $\text{kg/m}^3$	Strong
62 - 70	1000 $\text{kg/m}^3$ and above	Very Strong

## THE WOOD

Here, the descriptive text for the wood emphasizes some identifying features including the color of sapwood and heartwood, texture and grain, figure, presence of growth rings, and any odor or taste.

## PART SIX: INDEX OF COMMON/TRADE NAME

S/N	BOTANICAL NAME	COMMON/ TRADE NAME
01	Azalia spp (bella, africana)	Doussié (Cameroon), Apa, Aligna (Nigeria), Mkora, Mkola, Mbambakofi (Tanzania), Chanfuta, Mussacossa (Mozambique), Beyo, Meli, Azza (Uganda)
02	Alstonia boonei	Mujwa, Mujua (Uganda), Emien (Ivory Coast), Sindru (Ghana), Ahun, Awun, (Nigeria), Bokuk, Kanja (Cameroon), Kaiwi, Kauwi (Sierra Leone)
03	Amphimas pterocarpoides	Lati (Ivory Coast, Liberia), Edzui (Gabon), Edzil, Edjin (Cameroon), Yaya (Ghana), Bokanga (DRC)
04	Anigeria robusta	Agnegre, Anegre (Ivory Coast), Landosan (Nigeria), Mukali, Kali (Angola), Osan, Mutoke (Uganda), Mukangu, Muna (Kenya)
05	Anopyxis klaineana	Kokoti (Ghana), Ekiawa, Otutu (Nigeria), Bodioa (Ivory Coast), Noudougou (Cameroon), Evam (Gabon), Bobenkusu (DRC), Kpomusi (S/ Leone)
06	Anthonotha fragrans	Anthonotha (Kibokoko)
07	Antiaris Africana	Kyenkyen, Chenchen (Ghana), Mkuzu, Mlulu (Tanzania), Oro, Ogiovu (Nigeria), Kirundo, Mumaka (Uganda), Ako (Senegal)
08	Araliopsis tabouensis	Araliopsis (Grenian)
09	Beilschmiedia mannii	Kanda, Kanda rose (Cameroon), Atiokouo, Bite'hi (Ivory Coast), Nkonengu (Gabon), Bonzale (DRC), Mfimbo (Tanzania)
10	Berlinia confuse	M'possa (Angola, DRC), Bagbe (Benin), Ekpogoi (Nigeria), Ebiara berlinia (Gabon), Melegba, Pocouli (Ivory Coast), Essaben, Abem (Cameroon), Berlinia (Ghana), Sarkpei (S/ Leone)

S/N	BOTANICAL NAME	SPECIES CODE
49	Oldfieldia Africana	OLD
50	Ongokea gore	ONG
51	Parinari excels	PAR
52	Parkia bicolor	PAK
53	Pericopsis elata	PER
54	Piptadeniastrum africanum	PIP
55	Pterygota macrocarpa	PTE
56	Pycnanthus africanus	PYC
57	Rhodoguaphalon brevicuape	RHO
58	Sacoglottis gabonensis	SAC
59	Terminalia ivorensis	TEI
60	Terminalia superba	TES
61	Tetraberlinia tubmaniana	TET
62	Tieghemella heckelii	TIE
63	Triplochiton scleroxylon	TRI
64	Turraeanthus africanus	TUR
65	Uapaca guinensis	UAP

### SHRINKAGE LEVEL

Logs have very high moisture content when freshly felled. The wood gives up much of this moisture in drying to equilibrium with the relative humidity of the surrounding atmosphere. This initial drying out from the green state to air-dried is accompanied by shrinkage in dimension. The classification outline in this manual is therefore, based on test specimens dried down to 12% moisture content. Preferably, kiln drying is much appreciated to further reduce moisture content.

Radial	Tangential	Description
< 2.5%	< 3.5%	Very Small
2.6 - 4.0%	3.6 - 5.0%	Small
4.1 - 5.5%	5.1 - 7.5%	Comparatively Large
5.6 - 7.0%	7.6 - 9.0%	Large
> 7.1%	> 9.1%	Very Large

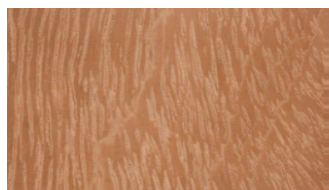
### MOVEMENT IN SERVICE

Following the initial reduction in dimension from the green state, timbers achieved a stable condition but that is also subject to variations in environmental moisture content, which can cause swelling and shrinking when the wood is in service. This movement in service is usual measure for those seeking timbers where the dimensional stability is important, for an example in the ease of opening and closing windows or doors.

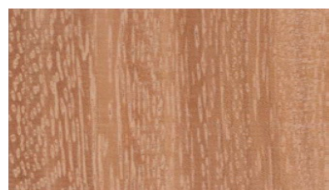
Radial	Tangential	Description
< 1.0%	< 1.5%	Small
1.0 - 2.0%	1.5 - 2.5	Medium
> 2.0%	> 2.5%	Large

## PART TWO: SPECIES DESCRIPTION FORMAT

Scientific Name	Afzelia bella
Code	AFZ
Family	Leguminosae
Common / Trade Name	Doussié (Cameroons), Apa, Aligna (Nigeria), Mkora, Mkola, Mbambakofi (Tanzania), Chanfuta, Mussacossa (Mozambique), Beyo, Meli, Azza (Uganda)
Distribution	Found in the West, Central, and East Africa.
Wood	The heartwood is reddish-brown after exposure; sapwood pale straw to whitish, well defined. Texture moderate to coarse; grain straight to interlocked; medium luster; without characteristic odor or taste.
Weight	Heavy, with air-dry density 816 kg/ m <sup>3</sup>
Durability	Heartwood is rated as <b>very durable</b> and moderately resistant to termite attack
Strength	Moderately strong
Shrinkage (green to oven-dry)	Very small
Movement In Service	Small
Indication of Forest Availability	The tree grows in all forest parts of the country but preferably abundant in dry semi-deciduous forest zone of the country.
Working Property	The wood is Rather difficult to saw and machine because of rapid dulling of saw teeth and cutters but works to a smooth finish; some tearing of grain on radial faces. Difficult to stain where pores contain yellow deposits
Historical Production Volume(m <sup>3</sup> )	173.957kg/m <sup>3</sup> (39 pieces of logs) 4.136(4 bundles)
Uses	Furniture, Exterior joinery, window frames, doors, flooring, heavy construction including harbor and dock work



Tangential Cells



Radial Cells

S/N	BOTANICAL NAME	SPECIES CODE
23	Dialium spp	DIA
24	Didelotia idea	DID
25	Distemonanthus benthamianus	DIS
26	Entandrophragma angolense	ENTA
27	Entandrophragma candollei	ENTC
28	Entandrophragma cylindricum	ENTCY
29	Entandrophragma utile	ENTU
30	Erythrophleum ivorensis	ERY
31	Fagara macrophylla	FAG
32	Funtumia elastic	FUN
33	Gilbertiodendron preussii	GIL
34	Guarea cedrata	GUA
35	Guibourtia ehie	GUI
36	Hallea ciliate (Mitragyna ciliate)	HAL
37	Hannoa klaineana	HAN
38	Haplormosia macrophylla	HAP
39	Heritiera utilis	TAR
40	Khaya anthotheca	KHA
41	Khaya ivorensis	KHI
42	Klainedoxa gabonensis	KLA
43	Lophira alata	LOP
44	Lovoa trichilioides	LOV
45	Mammea Africana	MAM
46	Mansonia altissima	MAN
47	Nauclea diderrichii	NAU
48	Nesogordonia papaverifera	NES



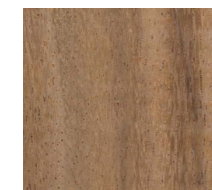
**PART FIVE: INDEX OF BOTANICAL NAMES AND  
SPECIES CODE**

S/N	BOTANICAL NAME	SPECIES CODE
01	Afzelia spp (bella, africana)	AFZ
02	Alstonia boonei	ALS
03	Amphimas pterocarpoides	AMP
04	Anigeria robusta	ANI
05	Anopyxis klaineana	ANO
06	Anthonotha fragrans	ANH
07	Antiaris africana	ANT
08	Araliopsis tabouensis	ARA
09	Beilschmiedia mannii	BEI
10	Berlinia confuse	BER
11	Bombax buonopozense	BOM
12	Brachystegia leonensis	BRA
13	Calpocalyz aubrevillei	CAL
14	Canarium schweinfurthii	CAN
15	Ceiba pentandra	CEI
16	Celtis spp (aldolfi-friederiei)	CEL
17	Chlorophora spp (regia, excels)	CHL
18	Chrysophyllum spp	CHR
19	Combretodendron macrocarpum	COM
20	Copaifera salikounda	COP
21	Cynometra ananta	CYN
22	Daniella thurifera	DAN

Scientific Name	Albizia Zygia
Code	ALB
Family	Caesalpinnaceae
Common / Trade Name(s)	<b>Albizia (Liberia)</b> , Albizia, Okuro (Ghana), Ayinre, Uwowe (Nigeria), Mugavu, Nongo (Uganda), Mtanga, Mduruasi (Tanzania).
Geographical Distribution	Widely distributed throughout tropical Africa; mostly trees of the high forest are exploited, but also common in secondary forests.
Wood	Heartwood golden yellow, light brown, red-brown., or dark brown, sometimes with a greenish, purple, or red tinge, sometimes with dark streaks; sapwood whitish, yellowish, or pinkish-brown, well demarcated. Texture variable from fine to coarse; grain straight to interlocked or irregular and wavy
Weight (oven dry to green weight)	Moderately heavy with air dry density of 640kg/m <sup>3</sup> .
Durability	Heartwood moderately durable but generally vulnerable to termite attack.
Strength	Moderately strong
Shrinkage	Very small
Movement In Service	Small
Indication of forest Availability	Widely distributed throughout Liberia; but more abundant in the drier forest zone of the Northwest.
Working Property	Working Properties: Saws and machines well and works easily with hand tools and dresses smoothly but with some tearing of interlocked grain; glues well. Intense irritation may be caused by the sawdust.
Historical Production Volume (m <sup>3</sup> )	31.647 kg/m <sup>3</sup> (5 pieces of logs) 15.960(8 bundles)
Uses	Furniture, joinery, flooring general carpentry



**Tangential Cells**



**Radial Cells**

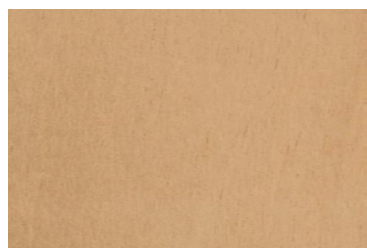
## PANEL PRODUCT

Wood product such as plywood is in major demand in Liberia but there is currently, no manufacturing industry in the country. Liberia greatly relied on importation to certify its plywood demand at the domestic level. Investment ventures are therefore encouraged since; Liberia has the required timbers resource base which hosts a range of species applicable for the purpose of producing plywood. For an example, Tet, Abura, Acajou-blanc, Aiele, Bossé, Cotton tree, Edinam, Llomba, Limba, Lovoa, Sikon, Sipo, Obeche, Whismore are about a few in the corridor of species of Liberia forest resource base.

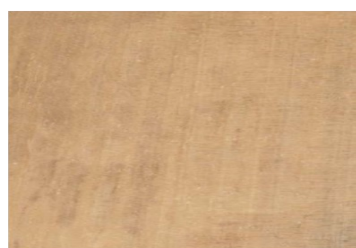
## PART FOUR: PRODUCTS GROUPS MARKET

Besides catering to the domestic wood demand of her peoples, Liberia also export timber products to the West African Republic of Morocco and other countries outside of Africa such as Bangladesh, China, Belgium, Germany, France, Hong Kong, India, Turkey, United Arab Emirate, and Viet Nam.

Scientific Name	Alstonia boonei
Code	ALS
Family	Apocynaceae
Common/ Trade name	Mujwa, Mujua (Uganda), Emien (Ivory Coast), Sindru (Ghana), Ahun, Awun, (Nigeria), Bokuk, Kanja (Cameroon), Kaiwi, Kauwi (Sierra Leone)
Distribution	Senegal to Congo, Uganda, and Sudan
Wood	The Wood is uniformly pale yellow or pale buff, with no distinction between sapwood and heartwood, it is sometimes discolored by staining fungi; texture is fine to medium, and the grain usually is straight
Weight	Light, with air-dry density of 400 kg/m <sup>3</sup>
Natural Durability	Non-durable, reported to readily decay readily when attacked by fungi under moist conditions; not resistant to termites
Strength	Weak
Shrinkage (green to oven-dry)	Small
Movement In Service	Small, excellent stability
Forest Availability	Alstonia boonei is found in all forest parts of Liberia but more common in the wet ever green forest zone.
Working Properties	The wood works easily with hand and machine tools, but sharp cutting tools are essential to ensure smooth surfaces
Historical Production Volumes (m <sup>3</sup> )	7.605 (1 piece of log)
Uses	Domestic utensils, light carpentry, boxes, wood-wool for packing bananas, matches



**Tangential Cells**



**Radial Cells**

## FLOORING AND DECKING

The use of wood flooring and decking is uncommon in Liberia. However, it seems to be gaining momentum and attention as some offices of public buildings and homes floors and walls are now veiled with wood imitation products especially those species with attractive color and explicate grain patterns. For the purpose of this aspect of wood designs several species can be recommended that are perfectly suited such as, Odum, Sipo, Limbali, Makore, and Ekki for an example. These species have heavy density with durable capacity and are common to all forest parts of the country.

## HEAVY DUTY

Liberia has an array of species of heavy density and of natural durability that are excellent for specific construction activities such as bridge building, road way sleepers, decking, water fencing and support structures. For an example, Dabema, Kussia, Ekki, Ikoro, and African walnut are just about a few among the vast majority of species that the country host.

## DOWELS AND TOOLS HANDLES

Species with low density such as Wawa, Fumtunia, Hanoa, Vitex and Calpocalyx are preferable for the manufacturing of broom handles, door handles as well as doweling.

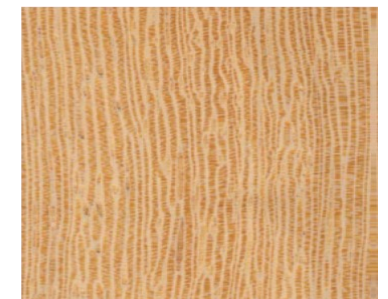
## VENEER

There are several species of low to medium - high density which can be peeled for plywood and veneer production. Plywood are suitable for purpose such as black boards, roof ceiling, in some cases, manufacturing of doors, and construction of partition of offices as well as room partitioning. Veneer products are also used for both interior and exterior decoration of homes and offices, faces of paneling, and ceiling as well. Some of the species preferred for this aspect of wood product include, Acajou-blanc, Aiele, Bossé, Edinam, Framire, Limba, Lovoa, Makoré, Sapele, Sipo, Wishmore Aiele, Edinam, Framire, Iroko, Kanda, Limba, Lovoa, Makoré, Sapele, Sikon, Sipo, Wishmore Naga, Daniellia, Lovoa etc.

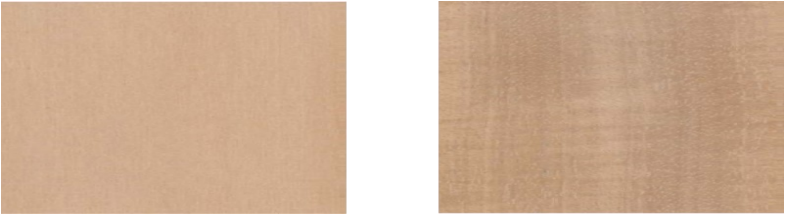
Scientific Name	Amphimas pterocarpoides
Code	AMP
Family	Leguminosae – Caesalpiniaceae
Common/ Trade name	Lati (Ivory Coast, Liberia), Edzui (Gabon), Edzil, Edjin (cameroon), Yaya (Ghana), Bokanga (DRC)
Distribution	Central and West Africa
Wood	Heartwood is light yellowish brown; the white sapwood is not sharply demarcated from the heartwood; texture is very coarse; grain may be straight or interlocked; low luster
Weight	Moderately heavy, with air-dry density of 753kg/m <sup>3</sup>
Natural Durability	The wood is non-durable, reported to be low in decay resistance
Strength	Moderately strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Small
Indication of Forest Availability	Found all over the country, but more frequently in the drier forest regions of Liberia.
Working Properties	Timber not easy to work, but it finishes smoothly
Historical Production Volumes (m <sup>3</sup> )	897.535 (171 pieces of logs)
Uses	Boxes, crates, paneling, interior joinery, house framing, flooring, sliced veneer; however, it is only occasionally utilized in Liberia.



**Tangential Cells**



**Radial Cells**

Scientific Name	Aningeria robusta
Code	ANI
Family	Sapotaceae
Common / Trade Name	Agnegre, Anegre (Ivory Coast), Landosan (Nigeria), Mukali, Kali (Angola), Osan, Mutoke (Uganda), Mukangu, Muna (Kenya)
Distribution	Widespread in tropical Africa, particularly common in parts of East Africa.
Wood	Heartwood yellowish-white, pale brown, or pinkish-brown, darkening slightly after exposure; sapwood not well demarcated. Texture medium to coarse; grain usually straight, sometimes wavy; lustrous; faint cedar like odor
Weight	Moderately heavy, with air-dry density of 750 kg/m <sup>3</sup>
Durability	Non-durable, wood is perishable, little resistance to attack by decay fungi and termites, liable to blue stain.
Strength	Moderately strong
Shrinkage	Large
Movement In Service	Rated as medium
Indication of Forest Availability	The tree grows in all Forest parts of Liberia, but preferable in the drier forest zones of the country
Working Property	Generally reported to saw and machine well, but some species are siliceous and have a blunting effect on cutters; rather difficult to finish; cuts well on rotary lathe or slicer.
Historical Production Volume(m <sup>3</sup> )	N/ A
Uses	General carpentry, joinery, veneer and plywood, furniture components
	

## **PART THREE: PRODUCTS GROUPS DEFINITION**


### **MACHINE WOOD**

Liberia has a low capacity in wood molding equipment, which is of necessity for the output of a variety of forms base on users demand. This deficiency has limited the exportation of furniture materials even though there are many qualified technicians and wood architects in the industry; as such endeavor, required technical know-how , preservatives and finishing materials that are required to make designs of international standards in order to attract the outside markets; for an example, beds, window, door, door paneling, chairs, interior and exterior decoration products and boards for ships flooring. Another deficiency lied in the lack of wood drying equipment (kiln or oven) which is necessary for determining moisture content for various wood items. Such equipment are expensive, hence limited and restricted to foreign investors in the sector while majority of wood products produce by local involves in the furniture field are normally air-dried and merely for local business markets. Nevertheless, there are good prospects for enhancing this aspect of the industry if partners and government investment are sought since we already have the forest resource base. We observed during our survey of few wood workshops in Monrovia, a demonstration of innovative designs made from handy tools; what more if there were molding machines at the various wood workshops of the country.


### **FURNITURE AND FURNITURE PARTS**


Despite the lack of modern wood work machineries required for producing different forms of wood products, there is a progressive advancement in the development of attractive design in furniture outputs in the country. Most of these materials are produce with the use of handy tools and cutting edges. Indeed, wood such as Acajou-blanc, Aiele, Edinam, Framire, Iroko, Kanda, Limba, Lova, Makoré, Sapele, Sikon, Sipo, Wishmore Niangon, Lova, are widely used in the production of furniture and furniture parts across the country. As reported and seen through observation of several wood workshops across Monrovia, the above named species has durable heart wood capacity and can be easily work in the production of beds, chairs, doors, cupboards, kitchen cabinets as well as in upholstery. Others species with light density such as wawa, calpocalyx, Hanoa and Abura are preferred in Liberia for the production of boxes and flooring support for casting works and carving products.

Scientific Name	Uapaca guineensis
Code	UAP
Family	Euphorbiaceae
Common/Trade name	Abo emido, Yeye (Nigeria), Rikio, Borikio, Rikio rivière (Ivory Coast, Cameroon), Sugar plum
Distribution	Tropical areas of West Africa, mostly in swampy regions but may also border on the savanna
Wood	Heartwood pale red, red-brown, or chocolate-brown; sapwood paler, usually not clearly demarcated; texture mostly medium to coarse; grain generally straight; little luster
Weight	Moderately heavy, with air-dry density of 736 kg/m <sup>3</sup>
Natural Durability	Highly durable, the wood is moderately stable
Strength	Moderately strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Medium
Indication of Forest Availability	It occurs all over Liberia, mostly in older secondary forest types and in good quantities.
Working Properties	Saws easily and generally works well with hand and machine tools; can be glued satisfactorily and nails fairly well, but care must be taken to avoid splitting when nailing near the edges
Historical Production Volumes (m <sup>3</sup> )	132.052(39 pieces of logs)
Uses	Good fuel and charcoal wood, light construction, boatbuilding, flooring. Fruits are edible

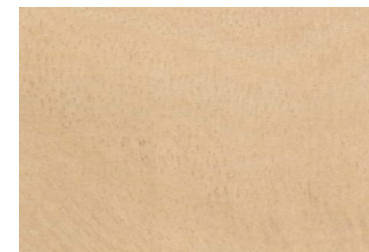
Scientific Name	Anopyxis klaineana
Code	ANO
Family	Rhizophoraceae
Common/ Trade name	Kokoti (Ghana), Ekiawa, Otutu (Nigeria), Bodioa (Ivory Coast), Noudougou (Cameroon), Evam (Gabon), Bobenkusu (DRC), Kpomusi (S/ Leone)
Distribution	Sierra Leone to Nigeria, Cameroon, DR Congo and Uganda, south to northern Angola
Wood	The wood is uniformly light yellow-brown, sometimes stained blue by a fungus; a rather low luster; texture is coarse with a harsh feel, and the grain is rather irregular
Weight	Heavy, with air-dry density of 816 kg/m <sup>3</sup>
Natural Durability	Moderately durable, being resistant to termites but susceptible to fungi and dry wood borers
Strength	Moderately strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Medium
Indication of Forest Availability	Occurs all over Liberia, often in small open aggregations, but somewhat more commonly in the evergreen forest zone.
Working Properties	Works rather easily, but material containing wavy grain has a tendency to tear in planing; gluing characteristics are rated as good; nailing and screwing are reported to require pre-boring; good finishing and polishing characteristics; works well with powered tools.
Historical Production Volumes (m <sup>3</sup> )	3068.590 (647 pieces of logs) 8.441(29 bundles)
Uses	Used for purposes such as industrial flooring, heavy carpentry, interior paneling and joinery, turnery and sliced veneer
	
Tangential Cells	Radial Cells

Scientific Name	<i>Anthonotha fragrans</i>
Code	ANH
Family	Leguminosae-Caes.
Common/ Trade name	Andomoteu (Côte d'Ivoire); Kibakoko (Congo); Lebelo, Kibakoko, Akoung élé évélé (Cameroon); Kibokoko Liberia; Adonmoteu, Anthonotha
Distribution	The tree spanned the Gulf of Guinea from Sierra Leone to Congo.
Wood	The heartwood is yellowish brown to brown with dark brown streaks, and indistinctly or fairly distinctly demarcated from the whitish to greyish yellow; the grain is usually straight, texture moderately coarse
Weight	Heavy, with air-dry density of 800 kg/m <sup>3</sup>
Natural Durability	The wood is moderately durable and susceptible to fungal attacks, and liable to borer and Lyctus attacks; the heartwood is resistant to impregnation with preservatives, the sapwood moderately resistant
Strength	Moderately strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Large
Forest Availability	The tree is widely scattered throughout the high forest of Liberia both dry and moist to ever green forest but as a medium-sized and rarely a large tree.
Working Properties	The wood is easy to saw, although saw teeth and cutting edges may blunt rapidly; it usually planes and finishes well; has a tendency to split upon nailing.
Historical Production Volumes (m <sup>3</sup> )	1.549.331 (373 pieces of logs) 53.351(80 bundles)
Uses	General carpentry work, joinery, flooring, veneer, turnery. Fruits are edible, kernels used for soap and lubricants.

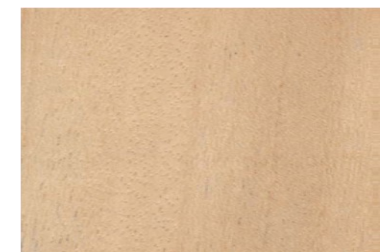
Scientific Name	<i>Turraeanthus africanus</i>
Code	TUR
Family	Meliaceae
Common/ Trade name (s)	Blima-pu (Liberia), Avodire (Ivory Coast), Asama (Cameroon), Apapaya, Avodire (Ghana), Apaya (Nigeria), Lusamba, M'fube (DRC)
Distribution	Sierra Leone westward to the Congo region and southward to Zaire and Angola
Wood	The sapwood is not distinct from the heartwood. The wood is cream to pale yellow with high natural luster; it eventually darkens to a golden yellow. The grain is sometimes straight but more often wavy or irregularly interlocked
Weight	Light, with air-dry density of 545 kg/m <sup>3</sup>
Natural Durability	Nondurable and extremely resistant to preservative treatment.
Strength	Medium
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Small
Indication of Forest Availability	The tree is scattered throughout the high forest zones of Liberia, but most frequent in forest with sandy soils.
Working Properties	The wood works fairly easy with hand and machine tools and finishes well in most operations
Historical Production Volumes (m <sup>3</sup> )	414.209(76 pieces of logs)
Uses	Well-known decorative veneer, furniture, fine joinery, cabinetwork, and paneling
	
<span style="margin-right: 100px;">Tangential Cells</span> Radial Cells	

Scientific Name	Triplochiton scleroxylon
Code	TRI
Family	Sterculiaceae
Common / Trade Name	Bado, M'bado (CAR), Eguess (Congo), Ayous, Ayus (Equatorial Guinea), Ayous/ Obeche (Garbon, Xwetin (Benin), Arere, Obeche (Nigeria), Samba (Ivory Coast), Ayous (Cameroon), Wawa (Ghana), Abachi (Germany, Holland)
Distribution	Widely distributed in tropical West Africa from Guinea to Cameroon
Wood	Timber whitish to pale straw with no difference between heartwood and sapwood. Texture medium to coarse; grain typically interlocked; lustrous; has an unpleasant smell when green but usually does not persist after drying
Weight	Light, with air-dry density of 384 kg/m <sup>3</sup>
Durability	Heartwood non-durable; liable to termite and other insect
Strength	Weak
Shrinkage (green to oven dry)	Small
Movement In Service	Small
Indication of Forest Availability	The tree is restricted to North-Western and South-Eastern forest zones of Liberia and can be found in good quantities.
Working Property	Works very easily with hand and machine tools but sharp edges are needed for a smooth finish, veneers easily, good gluing and nailing properties
Historical Production Volume(m <sup>3</sup> )	6.743 ( 1 log)
Uses	Furniture components, plywood, joinery, mill-work, boxes and crates, block board, particle and fiberboard, pattern making, artificial limbs
	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

Scientific Name	Antiaris Africana
Code	ANT
Family	Moraceae
Common/ Trade name	Kyenkyen, Chenchen (Ghana), Mkuzu, Mlulu (Tanzania), Oro, Ogiovu (Nigeria), Kirundo, Mumaka (Uganda), Ako (Senegal)
Distribution	Senegal to Sudan and southward to Uganda
Wood	Heartwood white or yellow-brown or gray-yellow not clearly demarcated from sapwood; grain interlocked, texture medium to coarse
Weight	Light, with air-dry density of 432 kg/m <sup>3</sup>
Natural Durability	Not durable. Heartwood perishable and liable to insect attack in both log and converted form
Strength	Weak
Shrinkage (green to oven-dry)	Comparatively Large
Movement In Service	Small
Indication of Forest Availability	The tree grows in all forest parts of Liberia but more frequent in the moist evergreen forest of Liberia.
Working Properties	Works easily with hand and machine tools but sharp cutters are needed; dresses smoothly, some tearing of interlocked grain; glues and nails satisfactorily
Historical Production Volumes (m <sup>3</sup> )	19.384 (3 pieces of logs)
Uses	Utility plywood, decorative veneer, furniture components, boxes, interior trim




Tangential Cells



Radial Cells

Scientific Name	Araliopsis tabouensis
Code	ARA
Family	Rutaceae
Common/ Trade name	Araliopsis (Grenian) d oo-clean (Gio); hn'toh (Gola, 'chicken popo')
Distribution	Liberia – Nigeria
Wood	The wood is fairly hard and heavy, yellowish or Nearly white, strongly scented. It has a woolly surface when sawn, and when sawn fresh it has a very Penetrating smell.
Weight	Heavy
Natural Durability	N / A
Strength	N / A
Shrinkage (green to ovendry)	N / A
Movement In Service	N / A
Indication of Forest Availability	Found throughout Liberia, predominantly a species of the evergreen forest zone.
Working Properties	N/A
Historical Production Volumes (m3)	195.328 (50 pieces of logs)
Uses	Construction wood; the bark skin is also use against craw-craw and yaw.

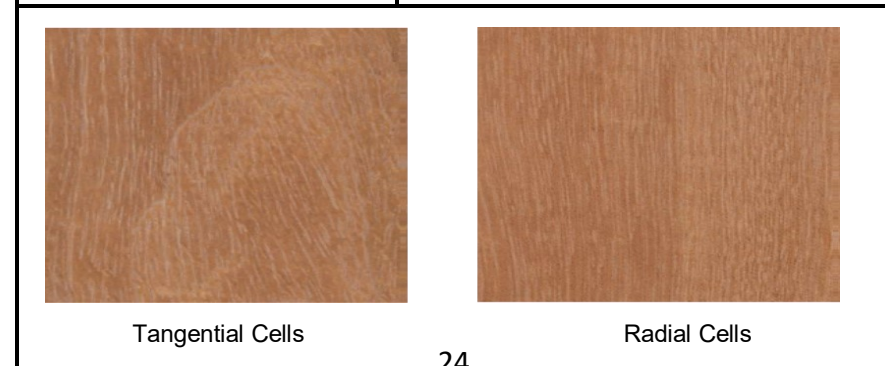
Scientific Name	Tieghemella heckelii
Code	TIE
Family	Sapotaceae
Common / Trade Name	Baku (Ghana), Makoré (Ivory Coast); Douka, Ukola (Gabon)
Distribution	The species is found from Sierra Leone to Cameroon, Gabon, and south to Cabinda; widely distributed in the high rain forests.
Wood	The Heartwood is pink to pinkish or red-brown; sapwood whitish or light pink, clearly demarcated; texture fine to medium; grain generally straight; lustrous; sometimes with an attractive moiré figure
Weight	Moderately heavy, with air-dry density of 672 kg/m <sup>3</sup>
Durability	The Heartwood is highly durable and resistant to termite attack; sapwood liable to powder-post beetle attack
Strength	Moderately strong
Shrinkage (green to ovendry)	Large
Movement In Service	Medium
Indication of Forest Availability	The tree grows throughout the forests of Liberia but frequent in south eastern forest belt of the country.
Working Property	The wood has a high silica content which causes blunting of cutting edges, particularly in dry wood; works reasonably well with hand and machine tools, good veneering properties, finishes well, good gluing properties. Fine dust may irritate nose and throat or cause dermatitis
Historical Production Volume(m <sup>3</sup> )	N/A
Uses	Furniture, cabinetwork, joinery, decorative veneers, paneling, boatbuilding, flooring, turnery, marine plywood
	
<span style="margin-right: 150px;">Tangential Cells</span> Radial Cells	


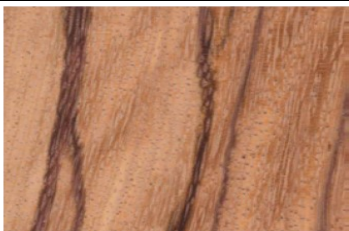



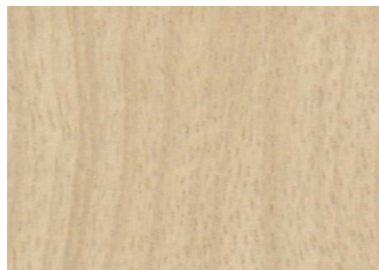
Scientific Name	Tetraberlinia tubmaniana
Code	TET
Family	Leguminosae
Common/ Trade name (s)	Sikon, Gola (Liberia)
Distribution	Known presently, only from Liberia
Wood	The heartwood is light reddish-brown and is distinct from the lighter colored sapwood; texture, moderately coarse; luster medium; grain is interlocked, showing a narrow stripe pattern on quartered surfaces.
Weight	Moderately heavy, with air-dry density of 625 kg/m <sup>3</sup>
Natural Durability	Moderately durable; sapwood is liable to powder-post beetle attack
Strength	Medium
Shrinkage (green to oven dry)	Large
Movement In Service	Medium
Indication of Forest Availability	It grows throughout Liberia but mainly in the south and in large quantities in the region of Greenville.
Working Properties	Works well with hand and machine tools, some tearing of grain when planing quarter-sawn faces, excellent turnery, slices well into veneers, good gluing properties.
Historical Production Volumes (m <sup>3</sup> )	8,440.663(2225 pieces of logs)
Uses	A general utility wood, veneer and plywood, furniture components, turnery







Scientific Name	Beilshmedia mannii
Code	BEI
Family	Lauraceae
Common/ Trade name	Kanda, Kanda rose (Cameroon), Atiokouo, Bite'hi (Ivory Coast), Nkonengu (Gabon), Bonzale (DRC), Mfimbo (Tanzania)
Distribution	Guinea-Congo
Wood	The heartwood is cherry red with a lasting cedar smell. The sapwood is greyish and sharply defined. It is a wood of low luster, medium textured and straight to cross grained odorless.
Weight	Moderately heavy, with air-dry density of 673 kg/m <sup>3</sup>
Natural Durability	Highly durable
Strength	Moderately strong
Shrinkage (green to oven dry)	Large
Movement In Service	Small
Indication of Forest Availability	It is found scattered throughout the high forest of Liberia, but more abundant in the south of the Putu range.
Working Properties	It is very easy to work
Historical Production Volumes (m <sup>3</sup> )	21.539 (6 pieces of logs)
Uses	Doors, ceilings, canoes, framing, interior and exterior joinery, flooring, decking, paneling



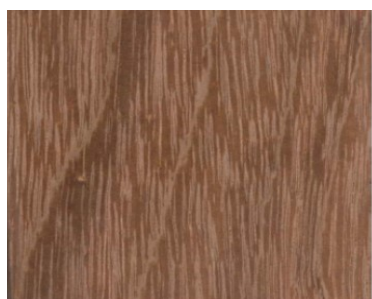
Scientific Name	Berlinia confusa
Code	BER
Family	Leguminosae- Caesalpinaceae
Common/Trade name	M'possa (Angola, DRC), Bagbe (Benin), Ekpogoi (Nigeria), Ebiara berlinia (Gabon), Melegba, Pocouli (Ivory Coast), Essaben, Abem (Cameroon), Berlinia (Ghana), Sarkpei (S/ Leone)
Distribution	Occurs in the high forest belt of Sierra Leone, Liberia, the Ivory Coast, the Gold Coast, Nigeria, and the Cameroons
Wood	Heartwood brown, pinkish-brown to deep red-brown, with dark purple or brown streaking; sapwood rather wide, whitish, often with a pink tint, clearly demarcated; texture medium to coarse; grain straight, interlocked, or irregular; without characteristic odor or taste when dry.
Weight	Moderately heavy, with air-dry density of 704 kg/m <sup>3</sup>
Natural Durability	Heartwood is moderately durable, moderately resistant to termite attack, and resistant to preservative treatment.
Strength	Moderately strong
Shrinkage	Large
Movement In Service	Small
Indication of Forest Availability	Found all over the high forests of Liberia but more abundant in north western forest part of the country.
Working Properties	Saws easily and generally works well with hand and machine tools; can be glued satisfactorily and nails fairly well, but care must be taken to avoid splitting when nailing near the edges.
Historical Production Volumes (m <sup>3</sup> )	337.485 (87 pieces of log) 8.299(13 bundles)
Uses	Heavy construction, furniture and cabinetwork, decorative veneers, paneling, interior and exterior joinery, flooring, stairs (inside), paneling
 	
<p style="text-align: center;">Tangential Cells                      Radial Cell</p>	

Scientific Name	Terminalia superba
Code	TES
Family	Combretaceae
Common / Trade Name	Ofram (Ghana), Fraké (Ivory Coast), Afara (Nigeria), Akom (Cameroon), Limba (Zaire, Angola). "Korina" a trade name in the U.S.A.
Distribution	Widely distributed from Sierra Leone to Angola and Zaire; occurs in rain and savanna forests
Wood	The Heartwood is yellow-brown, sometimes with nearly black markings producing an attractive figure; sapwood not distinct from heartwood. Texture moderately coarse; grain straight to irregular or interlocked; slightly lustrous; mild odor
Weight	Light, with air-dry density of 544 kg/m <sup>3</sup>
Durability	The Heartwood is nondurable, not resistant to termites, liable to severe ambrosia beetle and powder post beetle attack
Strength	Medium
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Small
Indication of Forest Availability	The tree can found in all forest parts of the country but preferably frequent in moist sites.
Working Property	Saws easily, works well with hand and machine tools, good veneering properties, good gluing and nailing characteristics, takes a good finish
Historical Production Volume(m <sup>3</sup> )	13.208(2 pieces of logs) 12.856(13 bundles)
Uses	Plywood, furniture, interior joinery, sliced for decorative veneers.
 	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

Scientific Name	<i>Terminalia ivorensis</i>
Code	TEI
Family	Combretaceae
Common / Trade	Black Afara, Idigbo (Nigeria), Emeri (Ghana), Framiré (Ivory Coast)
Distribution	West tropical Africa from Guinea to Cameroon, abundant in primary and secondary forests and transition formations
Wood	The Heartwood is yellow-brown or light pink-brown; sapwood somewhat paler, not clearly demarcated; texture medium to rather coarse; grain straight or slightly irregular; moderately lustrous; without distinctive odor or taste.
Weight	(oven dry/ air-dry density of 512 kg/m <sup>3</sup> )
Natural Durability	Heartwood is rated as durable and moderately resistant to termite attack; sapwood liable to powder post beetles
Strength	Medium
Shrinkage (green to oven dry)	Small
Movement In Service	Small.
Indication of Forest Availability	The tree can be found in all forest parts of the country but most abundant in the moist evergreen forest of south-eastern Liberia.
Working Property	Easy to work with hand and machine tools, a 20 degree cutting angle is suggested to avoid tearing of grain in planing, turns well, good nailing and gluing properties, takes a good finish
Historical Production Volume (m <sup>3</sup> )	9.165(2 pieces of logs) 108.114(104 bundles)
Uses	A good general purpose timber. Furniture components, joinery, decorative paneling, veneers, flooring, light construction
 	
<p style="text-align: center;">Tangential Cells <span style="margin-left: 150px;">Radial Cells</span></p>	

Scientific Name	<i>Bombax buonopozense</i>
Code	BOM
Family	Bombacaceae
Common/ Trade name	Alone, Ogoumalanga (Gabon), Msufi-mwitu, Mfume (Tanzania), Meguza (Mozambique), Kapokier (Senegal), Esodoum (Cameroon), Kapokier (Congo), Kapokie, Oba (Ivory Coast), Kouria (Nigeria)
Distribution	West Africa and extending eastward into Tanzania
Wood	Heartwood pale reddish-brown, yellowish-brown, or light brown with a purplish tint, sometimes with darker markings; sapwood whitish, not always sharply differentiated. Texture medium to coarse; grain usually straight; without luster; sometimes with gum veins.
Weight	Light, with air-dry density of 480 kg/m <sup>3</sup>
Natural Durability	Non-durable; heartwood perishable, not resistant to termite attack; sapwood vulnerable to powder-post beetle attack
Strength	Medium
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Small
Indication of Forest Availability	The tree grows in all forest parts of Liberia. More abundant in the moist semi- deciduous forest of the country.
Working Properties	Usually saws easily and works well with hand and machine tools but cutters must be kept sharp; glues and finishes well; easy to rotary peel veneers
Historical Production Volume (m <sup>3</sup> )	50.427 (11 pieces of log)
Uses	Plywood core stock, block board, boxes and crates, furniture components
 	
<p style="text-align: center;">Tangential Cells <span style="margin-left: 150px;">Radial cells</span></p>	

Scientific Name	Brachystegia leonensis
Code	BRA
Family	Caesalpinniceae
Common/Trade name	Tebako (Liberia), Naga (France), Okwen (Nigeria), Bodgei (S/ Leone)
Distribution	Endemic to Upper Guinea: Côte d'Ivoire, Liberia, and S/ Leone
Wood	Heartwood is light to dark brown, alternating dark and light stripes may be present; sapwood is about 15 cm wide, white or pale colored, and distinct from the heartwood; grain usually is deeply interlocked, and quarter-sawn surfaces show a stripe or roe figure; texture is medium.
Weight	Moderately heavy, with air-dry density of 704kg/m <sup>3</sup>
Natural Durability	Moderately durable; occasionally damaged by ambrosia beetles
Strength	Moderately strong
Shrinkage	Comparatively large
Movement In Service	Small
Indication of Forest Availability	It can be found in all forest areas of Liberia but more abundant in the south- eastern forest zone of the country.
Working Properties	
Historical Production Volumes (m <sup>3</sup> )	16,458.234 (2209 pieces of logs) Sawn wood production insignificant
Uses	The wood is suitable for manufacture of vehicles and for general construction that does not need great durability. It is technically suitable for the manufacture of plywood.

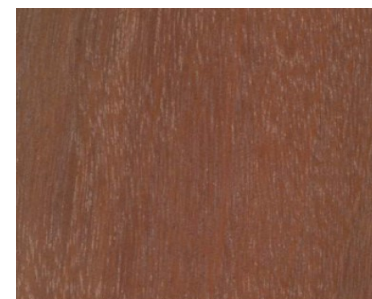


Tangential Cells

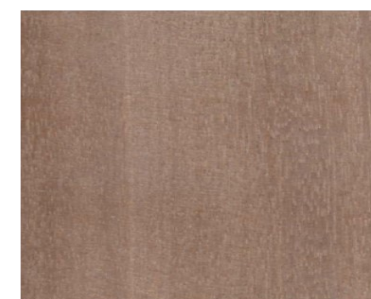


Radial Cells

Scientific Name	Sacoglottis gabonensis
Code	SAC
Family	Humiriaceae
Common/ Trade name	Akouapo, Tougbi (Ivory Coast), Atala, Tala, Ugu (Nigeria), Bedwa, Bidou, Bodoua (Cameroon), Essoua, Ozouga (Gabon), Ozouga (Ghana), Kpowuli (S/ Leone)
Distribution	Along the Gulf of Guinea, from Sierra Leone to Angola
Wood	The heartwood is a reddish or purplish brown that becomes yellowish after long exposure to light. It has a moderate luster; the texture is medium and the grain is usually interlocked.
Weight	Heavy, with air-dry density of 865 kg/m <sup>3</sup>
Natural Durability	Durable; resistance to decay and wood borers
Strength	Moderately strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Medium
Indication of Forest Availability	The tree is evergreen; it is very common throughout Liberia
Working Properties	The timber is fairly easy to work, finishes smoothly, and can take a high polish.
Historical Production Volumes (m <sup>3</sup> )	
Uses	The wood is used locally for box lumber, planks, and timbers



Tangential Cells

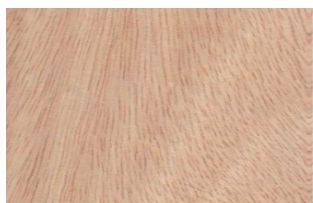


Radial Cells

Scientific Name	Rhodoguaphalon brevicuape
Code	RHO
Family	Bombacaceae
Common/ Trade name	Alone
Distribution	Throughout the west coast of Africa, Sierra Leone to Gabon
Wood	The sapwood is wide and nearly white. The heart wood bright red when fresh, brown-red to brown-violet when dry. Growth rings are visible owing to the increased density of the pores. The wood is straight grained, medium soft.
Weight	N / A
Natural Durability	N / A
Strength	N / A
Shrinkage (green to oven dry)	N / A
Movement In Service	N / A
Indication of Forest Availability	The tree grows in all forest parts of Liberia but preferable abundant in moist semi-deciduous and evergreen forest
Working Properties	Medium soft and work readily with sharp tools
Historical Production Volumes (m3)	N / A
Uses	Dye, canoes, boxwood, plywood, doweling and handles

Scientific Name	Calpocalyz aubrevillei
Code	CAL
Family	Fabaceae
Common/ Trade name	Badio (Calpocalyx)
Distribution	West tropical Africa - Sierra Leone to Ghana
Wood	Pale to whitish color, softer and lighter, not resistant to fungus and termites attack,
Weight	N / A
Natural Durability	Not durable
Strength	N / A
Shrinkage (green to oven dry)	N / A
Movement In Service	N / A
Indication of Forest Availability	The tree is wide spread in in both north western and south- eastern forest zone of Liberia, scattered or in rich stand, often in the vicinity of water.
Working Properties	Sawn timber warp very badly
Historical Production Volumes (m3)	272.130 (90 pieces of logs)
Uses	Manufacture of plywood, light construction activities, wawa or boxwood.

Scientific Name	Canarium Schweinfurthii
Code	CAN
Family	Burseraceae
Common / Trade Name	Abel (Cameroon), Aielé (Ivory Coast), Elemi (Nigeria), Bediwunua, Eyere (Ghana), Mwafu (Uganda) Aie'le', Bush candle stick
Distribution	Widely distributed in East, Central, and West Africa
The Wood	Heartwood a light pinkish-brown or light pinkish-yellow; sapwood whitish or straw colored, wide, not clearly differentiated. Texture somewhat coarse; grain interlocked sometimes producing a very attractive roe figure; lustrous; pleasant characteristic scent, without taste.
Weight	Light, with air-dry density of 480 kg/m <sup>3</sup>
Durability	Non-durable; heartwood not resistant to decay and is vulnerable to termite attack.
Strength	Medium
Shrinkage ( green to oven dried)	Small
Movement In Service	Medium
Indication of Forest Availability	Found in all forest zones of Liberia but preferably abundant in the drier forest paers of the country.
Working Property	Timber works easily with machine and hand tools but has a severe blunting effect on cutters because of silica content, sharp knives are required to avoid a woolly finish in planning, glues and nails satisfactorily, peels and slices easily.
Historical Production volume (m <sup>3</sup> )	409.662 (68 pieces of logs) 306.129(272 bundles)
Uses	Plywood, decorative veneers, parquetry, joinery, furniture components.



Tangential Cells


29






Radial Cells



Scientific Name	Pycnanthus africanus
Code	PYC
Family	Myristicaceae
Common/ Trade name	Gboyei (Sierra Leone) Bassa WishmoreG-boyei, Ilomba (Liberia), Akoua, Oualélé, Walele (Ivory Coast), Akomu (Nigeria), Angonga, Eteng (Cameroon), Aprokuma, Otie (Ghana), Ongabili (Gabon), Gongu (CAR), N'gongo (Angola), Mugongo (DRC), Anguekong (Equatorial Guinea)
Distribution	French Guinea and Sierra Leone through west tropical Africa lo Uganda and Angola
Wood	The wood is a grayish-white to pinkish-brown, in some trees may be a uniform light brown; no distinction between heartwood and sapwood; texture is moderately coarse and even; luster is low; grain is generally straight
Weight	Light, with air-dry density of 512 kg/m <sup>3</sup>
Natural Durability	Non-durable; easily attacked by insects and fungi
Strength	Medium
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Medium
Indication of Forest Availability	Found throughout Liberia, but it might be slightly more common in the moist semi-deciduous zone.
Working Properties	Saws easily and works well with hand and machine tools, excellent peeler, good gluing and nailing characteristics
Historical Production Volumes (m <sup>3</sup> )	212.893(16 pieces of logs)
Uses	A general-utility timber, furniture components, interior joinery, plywood

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Scientific Name	Pterygota macrocarpa
Code	PTE
Family	Sterculiaceae
Common/ Trade name	Kyere, Awari, Okyere (Ghana), Koto (Ivory Coast), Poroposo, Kefe (Nigeria), Efo ayus (Cameroon), Ake (Gabon), Ofete (Benin), Kakende (CAR), Ikame (DRC)
Distribution	The tree is found throughout the Mixed deciduous forests of West Africa.
Wood	Wood pale yellow to a creamy-white with little difference between sapwood and heartwood. Texture rather coarse; grain straight to interlocked.
Weight	Moderately Heavy, with air-dry density of 590 kg/m <sup>3</sup>
Natural Durability	Heartwood non-durable; liable to termite attack; sapwood liable to powder-post beetle attack.
Strength	Medium
Shrinkage (green to oven dry)	Large
Movement In Service	Medium
Indication of Forest Availability	
Working Properties	Works fairly easily with hand and machine tools, a cutting angle of 20 degrees is suggested to reduce tearing of interlocked grain in planning, glues and nails satisfactorily, peels and slices into veneers satisfactorily.
Historical Production Volumes (m <sup>3</sup> )	103.440(32 pieces of logs)
Uses	Furniture components, joinery, general carpentry, boxes and crates, plywood
	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	


Scientific Name	Celtis spp (aldolfi-friederiei)
Code	CEL
Family	Ulmaceae
Common/ Trade name	Esa (Ghana), Ba (Ivory Coast), Akasinsa (Uganda), Ita, Ohia (Nigeria), Mrinde, Mrunde (Tanzania)
Distribution	Trees are found in western, central, and parts of eastern Africa; locally frequent in the drier high forests
Wood	Heartwood and sapwood not clearly demarcated, whitish or light yellow, becoming grayish-white on exposure often with dark irregular markings; texture rather fine to coarse; grain straight to irregular, wavy, or interlocked; lustrous
Weight	Heavy, with air-dry density of 800 kg/m <sup>3</sup>
Natural Durability	Non-durable, highly susceptible to attack by decay and staining fungi as well as insect damage, including powder-post beetle attack
Strength	Moderately strong
Shrinkage (green to oven dry)	Large
Movement In Service	Medium
Indication of Forest Availability	The tree is extremely rare in Liberia
Working Properties	Generally reported easy to work in machining operations but rather difficult with hand tools; tearing of interlocked grain in planning, poor surfaces in shaping; nails and glues easily; moderate steam-bending qualities
Historical Production Volumes (m <sup>3</sup> )	2.692 (1 piece of log)
Uses	Flooring, tool handles, plywood, general construction, decorative veneer etc.
	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	


Scientific Name	Chlorophora Regia and Chlorophora Excelsa
Code	CHL
Family	Moraceae
Common / Trade Name	Semli (Sierra Leone, Liberia), Odoum (Ghana, Ivory Coast), Iroko, Oroko (Nigeria), Abang, Mandji (Cameroon, Gabon), Mereira (Angola), Kambala (Zaire), Mvule (East Africa).
Distribution	The two species, between them, extend across the entire width of tropical Africa. C. regia limited to the extreme west of Africa from Gambia to Ghana and is less drought resistant
Wood	Heartwood varies from a pale yellowish-brown to dark chocolate brown with lighter marking. Sapwood yellowish-white, clearly demarcated. Texture medium to coarse; grain typically interlocked, sometimes irregular; slightly greasy feel; without odor.
Weight	Moderately heavy, air-dry density of 688 kg/m <sup>3</sup>
Natural Durability	Heartwood is highly durable, resistant to termite and marine borer attack
Strength	Moderately strong
Shrinkage (green to oven-dry)	Small
Movement in Service	Small
Indication of Forest availability	The tree grows in all forest parts of Liberia but more abundant in the drier forest zone of the country.
Working Property	Works fairly easily with hand or machine tools but with some tearing of interlocked grain.
Historical Production Volume(S)	2087.364 (419 pieces of logs) 114.665(132 bundles)
Uses	Suggested as a teak substitute. Joinery, boatbuilding, piling and marine work, domestic flooring, furniture, veneer, railroad crossties, cabinetwork, shop fittings
 	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	


Scientific Name	Piptadeniastrum africanum
Code	PIP
Family	Caesalpinnaceae
Common / Trade Name	Dahoma, Mbeli (Liberia), Dabéma (Ivory Coast), Dahoma (Ghana), Agboin, Ekхими (Nigeria), Atui (Cameroon), Bokungu (Zaire), Mpewere (Uganda)
Distribution	West and East Africa from Senegal to Angola, the Congo region to Uganda
Wood	The Heartwood is light to golden-brown; sapwood wide, grayish to pale straw, distinct; texture coarse; grain broadly interlocked producing an attractive ribbon figure; moderate luster; may stain if in contact with iron under moist conditions.
Weight	Moderately Heavy, with air-dry density of 688 kg/m <sup>3</sup>
Durability	The Heartwood is durable, resistant to termite attack. Heartwood is resistant to preservative treatments; sapwood moderately resistant
Strength	Moderately strong
Shrinkage	Large
Movement in service	Medium
Indication of Forest Availability	One of the most common trees in Liberia; it can be found in all forest areas of the Country in good quantities.
Working Property	The wood is fairly easy to work with hand or machine tools, and it has only a moderate blunting effect on cutting edges. Saw teeth, however, are blunted rather rapidly because of the interlocked grain
Historical Production volume(m <sup>3</sup> )	32,837.889(4614 pieces of logs) 942.630(610 bundles)
Uses	Heavy construction, railway, sleepers, bridges. Props, wharfs decking, flooring.
 	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	



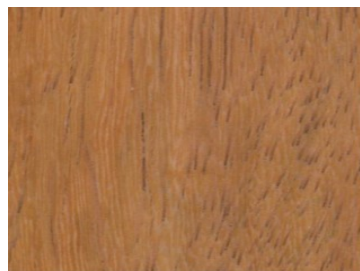
Scientific Name	Pericopsis elata (formerly Afromosia elata)
Code	PER
Family	Leguminosae – Ceasalpinniceae
Common/ Trade name	Afromosia, Kokrodua (Ghana), Assamela (Ivory Coast), Obang (CAR), Obang (Cameroon)
Distribution	Native to Ivory Coast, Ghana, Cameroon, and the Congo. The range of this species is rather extensive, but the principal production is limited to the boundary area of Ivory Coast and Ghana
Wood	Heartwood yellow-brown turning to a dark brown on exposure; sapwood narrow, lighter in color and clearly demarcated. Texture moderately fine; grain straight to interlock; some resemblance to teak
Weight	moderately heavy, with air-dry density of 689 kg/m <sup>3</sup>
Natural Durability	Heartwood is very durable and highly resistant to termite attack
Strength	Moderately strong
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Small
Indication of Forest Availability	The tree is rarely found in other forest parts of Liberia but restricted to the Grebo forest bordering the Cote'd'voire.
Working Properties	Works well with hand and machine tools, finishes cleanly, turns satisfactorily, good gluing, moderate steam-bending properties
Historical Production Volumes (m <sup>3</sup> )	105.560(32 pieces of logs) 0.006(2 bundles)
Uses	Boatbuilding, joinery, flooring, furniture, decorative veneers, considered an excellent teak substitute
	
<p style="text-align: center;">Tangential Cells <span style="margin-left: 150px;">67</span> Radial Cells</p>	

Scientific Name	Chrysophyllum spp
Code	CHR
Family	Sapotaceae
Common/ Trade name)	Kali, Mukali (Angola), Nom abam (Cameroon), Aniegre (Ivory Coast), Kararo (Ethiopia), Asanfena (Ghana), Mukangu, Muna (Kenya), Londojan (Nigeria), Osan (Uganda), M'boul (CAR), Tutu (DRC)
Distribution	Liberia - Uganda and Congo
Wood	The wood is light brown or pinkish brown to almost white. The texture is fine to medium, and the grain is straight to interlock. The luster is rather low.
Weight	Very heavy, with air-dry density of 961kg/m <sup>3</sup>
Natural Durability	Poorly durable, to non-durable
Strength	Strong
Shrinkage (green to oven dry)	Large
Movement In Service	Small
Indication of Forest Availability	The tree grows in all forest parts of Liberia but rather common in the central north-western part of the country.
Working Properties	The wood can be finished smoothly, but requires wear-resistant cutters for satisfactory machining.
Historical Production Volumes (m <sup>3</sup> )	68.652 (17 pieces of logs) 1.431(1 bundles)
Uses	General construction, carpentry, furniture, and turnery
	
<p style="text-align: center;">Tangential Cells <span style="margin-left: 150px;">32</span> Radial Cell</p>	

Scientific Name	Combretodendron macrocarpum
Code	COM
Family	Lecythidaceae
Common/ Trade name	Abalé (Ivory Coast), Owewe (Nigeria), Abing (Cameroon), Abin (Gabon), Minzu (Zaire).
Distribution	Guinea – Angola
Wood	Heartwood reddish to dark red-brown, sometimes with darker streaks; sapwood yellowish-white, clearly demarcated. Texture fine to moderately coarse; grain varying from straight to interlocked; when freshly-cut wood has a rotten cabbage odor which disappears on drying
Weight	Heavy, with air-dry density of 848 kg/m <sup>3</sup>
Natural Durability	Moderately durable, heartwood is resistant to moderately resistant to attack by decay fungi and termites, sometimes damaged by pinhole borers.
Strength	Moderately strong
Shrinkage (green to oven dry)	Large
Movement In Service	Large
Forest Availability	The tree grows in all forest part of the Liberia but preferably abundant in the northern part of the country.
Working Properties	Rather difficult to work, saws moderately well, dresses to good finish but there is tearing of interlocked grain, may char in boring, has poor steam-bending qualities, glues satisfactorily.
Historical Production Volumes (m <sup>3</sup> )	569.179 (122 pieces of logs) 44.287( 43 bundles)
Uses	Sliced to produce decorative veneers, heavy construction work where end splitting and checking are not objectionable.
	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

Scientific Name	Parkia bicolor
Code	PAK
Family	Leguminosae – Mimosaceae
Common/Trade name	Parcia, Fava bolota, Faverira, Auarango, Rayo, Tangama, Uya, Cascaron, Kwatakama
Distribution	West Africa South of the Sahara and Central Africa
Wood	Heartwood is light brown with darker irregular streaks; sapwood is nearly white; texture is coarse, and the grain is straight or interlocked.
Weight	Light, with air-dry density of 464 kg/m <sup>3</sup>
Natural Durability	Non-durable
Strength	Weak
Shrinkage	Comparatively large
Movement In Service	Medium
Indication of Forest Availability	Can be found throughout Liberia but most abundant in the moist evergreen forest parts of the country.
Working Properties	The timber is very easy to cut but it saws rather woolly, can be finished smoothly when it is dry.
Historical Production Volumes (m <sup>3</sup> )	162.551 (49 pieces of logs) 23.992(19 bundles)
Uses	Formworks, boxes and crates, paneling, interior joinery, fiber or particle boards
	
<p style="text-align: center;">Tangential cells                      Radial cells</p>	

Scientific Name	Parinari excels
Code	PAR
Family	Rosaceae
Common/ Trade name	Sougue (Ivory Coast), Kpar, (Liberia), rough skin plum (English) Eshago, Inyi (Nigeria), Mubura (Uganda), Mampata (Senegal), Mula (Tanzania)
Distribution	Sierra Leone, Liberia, Ivory Coast, Cameroon
Wood	The sapwood is yellowish white with a fragrance of honey or beeswax when it is freshly cut; heartwood ranges in color from light pinkish or grayish brown to reddish or chocolate brown; little luster; texture is moderately coarse and the grain is almost always decidedly interlocked
Weight	Moderately heavy, with air-dry density of 736 kg/m <sup>3</sup>
Natural Durability	Heartwood is nondurable and liable to termite attack; reported to be resistant to marine borers
Strength	Moderately strong
Shrinkage (green to oven dry)	Very large
Movement In Service	Large
Indication of Forest Availability	It grows throughout Liberia, scattered or in groups, most abundant in the drier forest parts of the country.
Working Properties	The timber is difficult to work when it is dry, but it finishes smoothly
Historical Production Volumes (m <sup>3</sup> )	10,124.380 (2281 pieces of logs) 142.952(182 bundles)
Uses	It is used locally for keelsons for boats and is suitable for constructions subjected to water, such as bridges, bridge floor planking, and floodgates



Tangential Cells

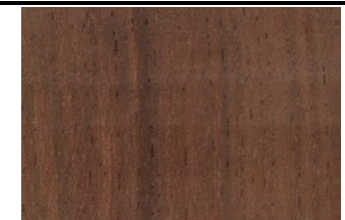


Radial Cells

Scientific Name	Copaifera salikounda
Code	COP
Family	Leguminosae (Caes.)
Common/ Trade name	Entedua (Ghana), Ovbialeke (Nigeria), Etimoe (Ivory Coast), Esak (Cameroon), Akpaflo (Benin), Andem-evine, Anzem noir (Gabon), Bilombi, Yama (CAR)
Distribution	It grows from Sierra Leone, Guinea, Liberia to Ghana
Wood	The heartwood is gray with a pink tint when it is freshly cut, but, after it has been exposed to the air, oxidation gives it a decidedly red or reddish brown color; it has a moderately high luster; texture is medium, and the grain is usually interlocked and even irregular
Weight	Moderately Heavy, with air-dry density of 710 kg/m <sup>3</sup>
Natural Durability	Durable, but sapwood is susceptible to attack by insect borers
Strength	Moderately strong
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Large
Forest Availability	The tree grows in all forest part of Liberia but preferable abundant in the central north-west of the country.
Working Properties	Works well with hand and machine tools though it has a tendency to chip off and to blunt cutting edges; glues and polishes well. It is advisable to pre-bore before nailing and screwing
Historical Production Volumes (m <sup>3</sup> )	166.587 (28 pieces of logs) 11.255(5 bundles)
Uses	Produces beautiful veneer for paneling, fine furniture and cabinets

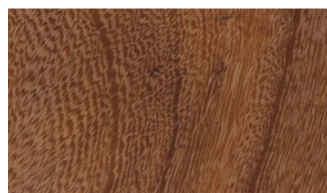


Tangential Cells

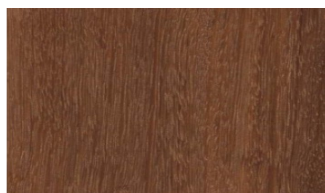


Radial Cells

Scientific Name	Cynometra ananta
Code	CYN
Family	Leguminosae-Caes.
Common/ Trade name	Apome (English), Nganga, Ekop-nganga (Cameroon), Mkokom (Equatorial Guinea), Baraka, Wehu (DRC)
Distribution	Liberia, Ivory Coast, Ghana
Wood	The heartwood is reddish brown, quite distinct from the light brown sapwood. The grain may be straight, but it usually is interlocked; texture is rather fine
Weight	Very heavy, with air-dry density of 910–1000 kg/m <sup>3</sup>
Natural Durability	The wood is durable, resistant to termite and lyctus attacks.
Strength	Strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Large
Indication of Forest Availability	Found in all forest parts of Liberia but more abundant in the drier forest zone of the country.
Working Properties	It is not easy to work when it is dry, for it is rather flinty to cut across the grain. It can be machined smoothly.
Historical Production Volumes (m3)	13873.092 (3721 pieces of logs) 3.065(13 bundles)
Uses	The timber is used in bridge building, railway work and heavy construction. The wood is used locally for timbers and posts. It probably is suitable for railway cross ties, bridge timbers, and other heavy construction.

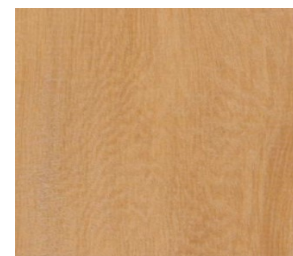


Tangential Cells



Radial Cells


Scientific Name	Ongokea gore
Code	ONG
Family	Olacaceae
Common/ Trade name	Kouéro (Ivory Coast), Andjek, Angueuk (Gabon, Cameroon), Boleko (Zaire).
Distribution	Occurs in south western Liberia and from the Ivory Coast to the Belgian Congo
Wood	The heartwood is yellowish. The texture is moderately fine and homogeneous. The grain is somewhat interlocked, and the luster is moderately low
Weight	Basic specific gravity (ovendry weight/green volume) 0.72; air-dry density 881 kg/m <sup>3</sup> .
Natural Durability	Durable; rarely attacked by termites
Strength	Moderately strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Large
Forest Availability	The tree be found in the southwestern part of Liberia but not in abundant .
Working Properties	Saws well but slowly, planes and machines well to a smooth finish, easy to glue, easy to slice into veneer.
Historical Production Volumes (m3)	148.906 (30 pieces of logs) 40.708(24 bundles)
Uses	General carpentry work, joinery, flooring, veneer, turnery. Fruits are edible, kernels used for soap and lubricants.




Tangential Cells



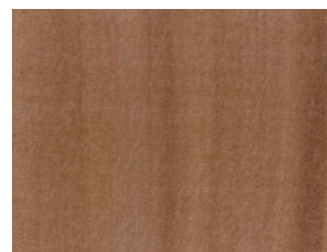
Radial Cells

Scientific Name	Oldfieldia Africana
Code	OLD
Family	Euphorbiaceae
Common/ Trade name	Dantoure (Ivory Coast), Kpaoli, Pauli (Liberia), Kpaoli, Pauli, Turtosa (S/ Leone)
Distribution	Sierra Leone, Liberia, Ivory Coast, Cameroon
Wood	Heartwood is brown or reddish brown, and the sapwood is grayish olive, not sharply demarcated, and sometimes with a greenish stain; luster is rather low; wood has a slightly bitter taste; texture is medium fine and the grain is irregular, often interlocked.
Weight	Very heavy, with air-dry density of 993 kg/m <sup>3</sup>
Natural Durability	The wood is reported to be highly durable and immune to attack by shipworms
Strength	Strong
Shrinkage (green to oven-dry)	Large
Movement In Service	Small
Indication of Forest Availability	It grows throughout Liberia, scattered or in groups, most abundant in north western forest parts of Liberia.
Working Properties	The timber is difficult to work when it is dry, but it finishes smoothly.
Historical Production Volumes (m <sup>3</sup> )	3285.436 (735 pieces of logs) 15.340(13 bundles)
Uses	It is used locally for keelsons for boats and is suitable for constructions subjected to water, such as bridges, bridge floor planking, and floodgates
	
<p style="text-align: center;"><b>Tangential Cells</b>                      <b>Radial Cells</b></p>	

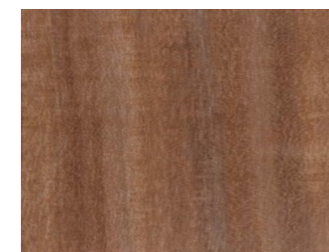
Scientific Name	Daniellia thurifera
Code	DAN
Family	Caesalpiniaceae
Common/ Trade name	Ogea, Ehyedua, Shedua (Ghana), Oziya, Daniellia (Nigeria), Faro, Ogea (Ivory Coast), Nsou (Cameroon), N'su (Equatorial Guinea), Jatin (Benin), Lonlaviol (Gabon), Bolengu (DRC), Gbessi (S/ Leone)
Distribution	Spanned the coast of West Africa
Wood	The sapwood is whitish; it has a thickness of 10 to 18 cm. The heartwood is pale pinkish brown to reddish brown with greenish-brown streaks, it is clearly demarcated; grain straight or slightly interlocked, with medium to coarse texture.
Weight	Light, with air-dry density of 496 kg/m <sup>3</sup>
Natural Durability	Non-durable; important risks of decay attacks at any processing step, from logs up to final products
Strength	Medium
Shrinkage (green to oven-dry)	Comparatively Large
Movement In Service	Medium
Indication of Forest Availability	The tree grows almost in all forest parts of Liberia but more abundant in the wet ever green forest zone of the country.
Working Properties	Works easily with hand and machine tools; nails and glues well.
Historical Production Volumes (m <sup>3</sup> )	819.796 (136 pieces of logs) 4.019(6 bundles)
Uses	Core stock for plywood, joinery, general millwork, furniture components, boxes and crates, a decorative veneer can be produced from selected logs.
	
<p style="text-align: center;"><b>Tangential Cells</b>                      <b>Radial Cells</b></p>	

Scientific Name	Dialium aubreviellie
Code	DIA
Family	Leguminosae
Common/ Trade name	Khleng (Thailand), Xoay, Kralanh (Cambodia), Kerandji (Indonesia)
Distribution	Spanned the West coast of Africa, mostly found on flat and hilly lands but not in swamps.
Wood	Heartwood generally golden-brown or red-brown when freshly cut but darkening on exposure, some species becoming almost black; sapwood white to yellowish-white, distinct. Texture moderately fine to somewhat coarse; grain interlocked to wavy; moderately to highly lustrous; without distinctive odor or taste; ripple marks prominent.
Weight	961kg/m <sup>3</sup> . air-dry density over green weight
Natural Durability	Moderately durable
Strength	Strong
Shrinkage (green to ovendry)	Large
Movement In Service	Medium
Forest Availability	The tree grows in all forest parts of the country but preferable abundant in the drier north-western forest zone of Liberia.
Working Properties	Difficult to saw and machine because of the high density, rapid dulling of cutters, dresses smoothly
Historical Production Volumes (m <sup>3</sup> )	1214.805 (311 pieces of logs) 11.864( 12 bundles)
Uses	Carpenter tools, tool handles, industrial flooring, machinery parts, heavy construction



Scientific Name	Nesogordonia papaverifera
Code	NES
Family	Sterculiaceae
Common/ Trade name	Kotibé (Ivory Coast), Otutu (Nigeria), Owoé (Cameroon), Arborbora (Gabon), Kondofindo (Zaire), Naouya (Angola), Abumana, Akumaba, Epro (Ghana)
Distribution	From Sierra Leone to Cameroon and northern Gabon
Wood	Heartwood reddish-brown; sharply defined from 5 -6 cm. wide lighter-colored sapwood. Texture is fine and even; grain narrowly interlocked producing a stripe figure; medium luster; without characteristic odor or taste.
Weight	Heavy, with air-dry density of 800 kg/m <sup>3</sup>
Natural Durability	Heartwood is durable and fairly resistant to termite attack
Strength	Moderately strong
Shrinkage (green to ovendry)	Large
Movement In Service	Medium
Indication of Forest Availability	The tree also grows in dry semi-deciduous but frequent in the moist evergreen forest zone of Liberia.
Working Properties	Works well with hand and machine tools.
Historical Production Volumes (m <sup>3</sup> )	N/ A
Uses	General construction, floors, joinery, turnery, boatbuilding, tool handles, gunstocks, plywood, utility cross-arms, furniture





Tangential Cells



Radial Cells

Scientific Name	Nauclea diderrichii
Code	NAU
Family	Rubiaceae
Common / Trade Name	Kusia (Ghana), Badi (Ivory Coast), Bilinga (Gabon), Akondoc (Cameroon), N'Gulu-maza (Zaire), Kilingi (Uganda)
Distribution	The tree is widely distributed from Sierra Leone to the Congo region and eastward to Uganda
Wood	The heartwood is a uniform and rather distinctive yellow or orange-brown; the pale colored sapwood is distinctly defined; texture is coarse; luster medium; grain is usually interlocked and irregular, producing a variety of patterns on quartered surfaces.
Weight	Moderately heavy, with air-dry density of 752 kg/m <sup>3</sup>
Durability	The heartwood is very durable and moderately resistant to preservative treatment
Strength	Moderately strong
Shrinkage (green to oven dry)	Large:
Movement In service	Small
Indication of Forest Availability	Found in all forest parts of Liberia. Most abundant in the drier forest zone of Liberia
Working Property	Bilinga is reported to work with moderate ease in most machining operations, but irregularity of grain is likely to cause difficulty in planning. Operations
Historical Production Volume(m <sup>3</sup> )	10,272.523 (2274 pieces of logs) 9.855(15 bundles)
Uses	Exterior and interior constructional work, flooring, cabinet work, fittings, railway sleepers, harbour works, sliced veneers, machine parts, wagon bottoms, turnery and transmission poles. Locally, it is also used for mortars, canoes, bridges and tables
 	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

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Scientific Name	Didelotia idea
Code	DID
Family	Caesalpiniaceae
Common/ Trade name	Bondu (Liberia), Angok, Towe (Gabon), Ekop-gombe, Combe (Cameroon), Timba (S/ Leone), Broutou, Toubaouate (Ivory Coast)
Distribution	Distributed in Sierra Leone, Liberia, Côte d'Ivoire and Ghana
Wood	The heartwood is pinkish red, turning reddish brown upon drying, and is distinctly demarcated from the up to 7.5 cm wide, yellowish brown to reddish brown sapwood. The grain is straight or slightly interlocked, texture coarse and even
Weight	moderately heavy, with air-dry density of 650 kg/m <sup>3</sup>
Natural Durability	Heartwood is only moderately durable, being susceptible to attacks by fungi, termites and pinhole borers
Strength	Moderately strong
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Moderately small
Indication of Forest Availability	The tree grows in all forest parts of Liberia but preferably abundant in moist evergreen forest..
Working Properties	The wood works fairly well with both hand and machine tools; holds nails and screws well, and glues satisfactorily
Historical Production Volumes (m <sup>3</sup> )	7800.394 (1625 pieces of logs) 11.823(57 bundles)
Uses	It is suitable for light construction, light flooring, joinery, interior trim, ship building, vehicle bodies, furniture, ladders, toys, novelties, boxes, crates, tool handles, draining boards, turnery, veneer, plywood, hard-board and particle board
 	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

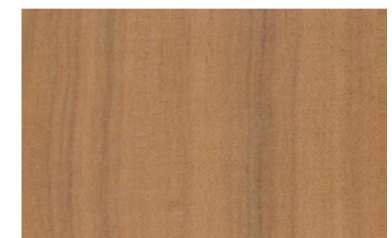
38

Scientific Name	Disthemonathus Benthamianus
Family	Ceasalpinnaceae
Code	DIS
Common / Trade Name (s)	Barré (Ivory Coast), Bonsamdua (Ghana), Eyèn (Cameroon), Ayanran (Nigeria), Movingui, (Gabon) Monkey can't Climb
Distribution	Widely but sparsely distributed throughout the high forests of West Africa
Wood	Heartwood yellowish to yellow-brown, sometimes with dark streaking; sapwood narrow, whitish or straw colored, fairly distinct. Texture fine; grain often interlocked, sometimes wavy; lustrous; some logs produce a decorative figure.
Weight	Moderately heavy, with air-dry density of 720 kg/m <sup>3</sup>
Natural Durability	Heartwood is moderately durable and moderately resistant to termite attack.
Strength	Moderately strong
Shrinkage	Small
Movement In service	Small
Indication of forest Availability	In Liberia, it is found in all forest parts of the country but more frequent in drier forest zone of the country.
Working Property	Works fairly readily with machine and hand tools. Takes a good finish, good gluing properties, easy to peel into veneers, moderately good steam-bending properties.
History Production Volume (m <sup>3</sup> )	67.136 (13 pieces of logs) 9.317(10 bundles)
Uses	Furniture, cabinetwork, joinery, flooring, decorative veneers. It is suggested as an oak alternative.

Scientific Name	Mansonia altissima
Code	MAN
Family	Sterculiaceae
Common/ Trade name	Aprono (Ghana), Bété (Ivory Coast), Ofun (Nigeria), Koul (Cameroon)
Distribution	Occurs in Ivory Coast, Ghana, and southern Nigeria
Wood	The heartwood varies from a light to dark gray-brown, frequently with a purplish cast, often shows alternating lighter and darker bands; texture fine and uniform; grain generally straight: luster is low
Weight	Moderately heavy, with air-dry density of 592kg/m <sup>3</sup>
Natural Durability	Heartwood is highly durable, highly resistant to termite attack
Strength	Medium
Shrinkage (green to oven-dry)	Comparatively Large
Movement In Service	Medium
Indication of Forest Availability	Extremely rare in Liberia Only once found on the eastern slopes of the ridge in the Gio National Forest
Working Properties	Works easily with hand and machine tools with little dulling of cutters, has good nailing and gluing properties
Historical Production Volumes (m <sup>3</sup> )	13.145 (4 pieces of logs)
Uses	High quality cabinet and furniture work, joinery, turnery, decorative veneers. Bark contains a cardiac poison of the digitalis group. Used as an alternative for walnut





Tangential Cells


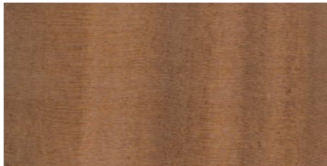


Radial cells



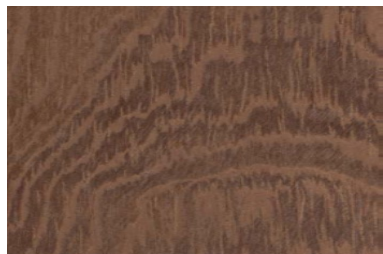
Scientific Name	Mammea Africana
Code	MAM
Family	Irvingiaceae
Common/ Trade name	Bompegya (Ghana), Kaikumba/Oboto (Liberia, Sierra Leone), Ologbomodu (Nigeria), Aborzok (Cameroon), Bokoli (Zaire)
Distribution	Found in mixed deciduous forests from Sierra Leone to Angola and Zaire, prefers rather wet environment and sometimes forms small stands on flood plains.
Wood	Heartwood dark red or red-brown, darkening to a mahogany color; sapwood light or pink-brown, well demarcated. Specked with horizontal gum ducts. Texture somewhat coarse; grain straight to interlocked; without luster; odor or taste nor characteristic.
Weight	Heavy, with air-dry density of 769 kg/m <sup>3</sup>
Natural Durability	Durable; heartwood is reported to have good decay resistance but is moderately susceptible to termite attack
Strength	Moderately strong
Shrinkage (green to oven dry)	Large
Movement In Service	Medium
Indication of Forest Availability	Mammea africana is found throughout Liberia, scattered through the high forest both dry and moist evergreen forest.
Working Properties	Saws cleanly and works well but mineral matter in the vessels tends to blunt cutters. Appreciable quantities of gum are exuded if veneers are hot-pressed into plywood. Takes a fine finish.
Historical Production Volumes (m <sup>3</sup> )	115.261 (23 pieces of logs) 1.978(2 bundles)
Uses	Furniture components, joinery, millwork, general carpentry. Considered as a mahogany substitute
 	
Tangential Cells	Radial Cells

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Scientific Name	Entandrophragma angolense
Code	ENTA
Family	Meliaceae
Common/ Trade name	Mukusu (Uganda), Tiam (Ivory Coast), Edinam (Ghana), Acuminata, Livuite (Angola), Abeba (Cameroon), Gedu nohor (Nigeria), Lifaki, Vovo (DRC), Dongomanguila (E. Guinea), Abeubegne (Gabon)
Distribution	French Guinea to Angola and eastward through the Congo to the Sudan and Uganda
Wood	The heartwood is generally a dull reddish-brown and distinct from the sapwood, which may be up to 4 inches thick. Texture is similar to Mahogany and khaya; grain is interlocked
Weight	moderately heavy, with air-dry density of 545kg/m <sup>3</sup>
Natural Durability	Heartwood is moderately durable and extremely resistant to preservative treatment
Strength	Medium
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Small
Indication of Forest Availability	It is found all over Liberia, in high forests as well as secondary formations. Its frequency is higher in the south eastern forest zone of the country.
Working Properties	Works rather easily with hand and machine tools, but there is tearing of interlocked grain; otherwise a good finish is obtained in most operations. The wood finishes and stains well and provides satisfactory glue bonds. It nails and screws well.
Historical Production Volumes (m <sup>3</sup> )	645.513 (116 pieces of logs) 683.667(472 bundles)
Uses	Tiam provides both plain and decorative veneer and is used extensively in this form. Other uses include furniture and cabinet making and, to a certain extent, boat construction.
 	
Tangential Cells	Radial Cells

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Scientific Name	Entandrophragma Candollei
Code	ENTC
Family	Kosipo
Common / Trade Name	Omu (Nigeria), Candollei (Ghana), Kosipo (Liberia)
Distribution	West Africa to Angola and the Congo region; in evergreen, moist, and semi- deciduous forest.
Wood	Heartwood dull brown or purple-brown and clearly demarcated from the whitish to pale brown sapwood; texture rather coarse; grain generally inter-locked; without distinctive odor or taste.
Weight	Moderately heavy, with air-dry density of 720 kg/m <sup>3</sup>
Durability	Heartwood moderately durable and moderately resistant to termite attack.
Strength	Medium
Shrinkage	Comparatively large.
Movement In service	Medium
Indication of Forest Availability	The tree can be found in all forest parts of the country but more abundant especially in transitional formations.
Working Property	Rather difficult to saw, works readily with band and machine tools, tends to tear interlocked grain, polishes and finishes well.
History Production Volume (m <sup>3</sup> )	105.148 (21 pieces of logs) 46.740 (33bundles)
Uses	Joinery, furniture and cabinetwork, flooring, decorative veneers, plywood, boat construction.



Tangential Cells

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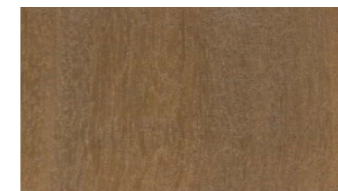
Radial Cells

Scientific Name	Lovoa Trichilloides
Code	Lovoa
Family	Meliaceae
Common / Trade Name	Mpengwa (Ghana), Anamemila, Apopo, Sida (Nigeria), Bombulu (Zaire), Dibétou (Gabon, Ivory Coast), Congowood, Tigerwood (USA), Lovoa, Apopo, ida, African walnut, temariri
Distribution	West Tropical Africa from Sierra Leone to Gabon
Wood	The Heartwood is yellowish-brown, sometimes marked with dark streaks or veins; sapwood light gray, narrow, clearly demarcated. Texture fine to medium; grain usually interlocked with an attractive ribbon figure; lustrous; cedar like scent.
Weight	544 kg/m <sup>3</sup> (oven dry weight/ air-dry density)
Durability	The heartwood is moderately durable, liable to dry-wood termite attack. Sapwood liable to powder-post beetle attack.
Strength	Medium
Shrinkage	Small
Movement in Service	Small
Indication of Forest Availability	Lovoa is found throughout Liberia in both dry and moist evergreen forest, mostly scattered, sometimes in small groups. Most frequent in south-eastern forest zone of Liberia.
Working Property	Easy to work but sharp tools are required to avoid tearing, particularly when machining quarter sawn faces. Good gluing properties, moderate steam-bending properties.
Historical Production Volume (m <sup>3</sup> )	4485.969 (810 pieces of logs) 199.495(160 bundles)
Uses	General carpentry, Furniture and cabinetwork, decorative veneers, paneling, joinery, shop fixtures





Tangential Cells

58



Radial Cells

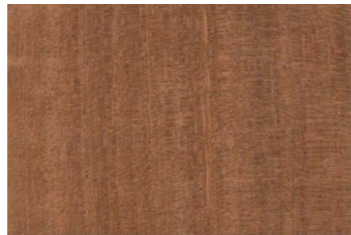
Scientific Name	Lophira alata
Code	LOP
Family	Ochnaceae
Common / Trade Name	Bongossi, Bakundu (Cameroon), Kaku (Ghana), Esore (Ivory Coast), Aba (Nigeria), Endwi (Sierra Leone), Azobe or ekki, Iron wood
Distribution	West Africa and extending into the Congo Basin
Wood	Heartwood dark red, chocolate-brown, or purple-brown with conspicuous white deposits in the vessels; sapwood pale pink, well defined; texture coarse; grain usually interlocked; luster low; without characteristic odor or taste
Weight	Very heavy, with air-dry density of 1,121 kg/m <sup>3</sup>
Durability	The Heartwood is very durable but only moderately resistant to termite attack. Resistant to acids. Good Resistant to teredo attack.
Strength	Very Strong
Shrinkage (green to oven dry)	Very large
Movement	Large
Indication of Forest Availability	It is found throughout Liberia in good quantities
Working Property	Very difficult to work with hand and machine tools; severe blunting effect if machined when dry; can be dressed to a smooth finish; gluing properties usually good
Historical Production Volume(m <sup>3</sup> )	147004.392 (21093 pieces of logs) 186.462(160 bundles)
Uses	Heavy construction work, harbor work, heavy-duty flooring, parquet flooring, railroad Sleepers
	
<p style="text-align: center;"><b>Tangential Cells</b>                      <b>Radial Cells</b></p>	

Scientific Name	Entandrophragma cylindricum
Code	ENTCY
Family	Meliaceae
Common/ Trade name	Aboudikro (Ivory Coast), Penkwa (Ghana), Muyovu (Uganda), Sapelli (Cameroon), Libuyu (Zaire)
Distribution	Sierra Leone to Angola and eastward through the Congo to Uganda.
Wood	Heartwood-medium to fairly dark reddish-brown or purplish-brown; sapwood whitish or pale yellow, distinct. Texture rather fine; grain interlocked, sometimes wavy, producing a narrow, uniform, roe figure on quartered surfaces; lustrous; without a distinctive taste but with a cedar-like scent.
Weight	Moderately heavy, with air-dry density of 623 kg/m <sup>3</sup>
Natural Durability	Heartwood is moderately durable and as resistant to preservative treatment.
Strength	Medium
Shrinkage (green to oven dry)	comparatively large
Movement In Service	Medium
Indication of Forest Availability	Grows throughout Liberia but more frequently in the moist evergreen forests zone of the country.
Working Properties	Works fairly easily with machine tools, although interlocked grain offers difficulties in planing and molding; finishes and glues well; works quite well with hand and machine tools
Historical Production Volumes (m <sup>3</sup> )	178.293 (25 pieces of logs) 489.712(383 bundles)
Uses	Furniture and cabinetwork, decorative veneers, plywood, joinery, flooring, paneling
	
<p style="text-align: center;"><b>Tangential Cells</b>                      <b>Radial Cell</b></p>	

Scientific Name	Entandrophragma utile
Code	ENTU
Family	Meliaceae
Common/ Trade name	Efuodwe (Ghana), Sipo (Ivory Coast), Okeong (Nigeria), Assié (Cameroon), Kosi-Kosi (Gabon), Mufumbi (Uganda)
Distribution	Principally from West and Central Africa
Wood	Heartwood fairly uniform red- or purple-brown; well demarcated from the light-brown sapwood. Texture medium; grain interlocked and rather irregular, faint cedar-like scent. Timber is corrosive to metals.
Weight	Moderately heavy, with air-dry density of 657kg/m <sup>3</sup>
Natural Durability	Heartwood is durable and extremely resistant to preservative treatment
Strength	Medium
Shrinkage (green to oven-dry)	Comparatively large
Movement In Service	Medium
Indication of Forest Availability	Can be found in both north and southern part of Liberia, but most abundant in the south east of Liberia.
Working Properties	Works fairly easily with hand and machine tools, interlocked grain may cause tearing in planing and shaping, finishes well, glues and nails easily
Historical Production Volumes (m <sup>3</sup> )	1686.998 (242 pieces of logs) 6.745(5 bundles)
Uses	Furniture and cabinetwork, joinery, decorative veneers and plywood, boat construction



Tangential Cells



Radial Cells


Scientific Name	Klainedoxa gabonensis
Code	KLA
Family	Irvingiaceae
Common/ Trade name	Kroma (Ivory Coast), Odudu (Nigeria), Mututu (Uganda)
Distribution	From Guinea to the Congo Basin, Uganda, and Sudan
Wood	Heartwood orange-yellow or golden-brown, turning on exposure to a dark brown with black veining; sapwood not clearly demarcated. Texture fine to medium; grain straight to interlocked; without characteristic odor or taste.
Weight	Very heavy, with air-dry density of 1,089 kg/m <sup>3</sup>
Natural Durability	Heartwood highly durable, immune to termite attack
Strength	Very Strong
Shrinkage (green to oven-dry)	Very large
Movement In Service	Large
Indication of Forest Availability	In Liberia, it is spread throughout the country in the evergreen forests as well as in moist semi-deciduous forests. Population trend and density is unknown.
Working Properties	N/ A
Historical Production Volumes (m <sup>3</sup> )	1616.160 (284 pieces of logs) 11.223(12 bundles)
Uses	Heavy durable construction, factory flooring, mine timbers, railroad crossties, tool handles




Tangential Cells



Radial Cells

Scientific	Khaya ivorensis
Code	KHI
Family	Meliaceae
Common / Trade Name	Munyama (Uganda), Acajou d'Afrique (Ivory Coast), Dubini, Dukuma fufu (Ghana), Ogwango (Nigeria)
Distribution	Occurs in the rain forests from the Ivory Coast to the Cameroons and Gabon
Wood	The heartwood is light pinkish-brown darkening upon exposure to reddish-brown; sapwood whitish or yellowish, not always sharply demarcated. Texture medium to coarse; grain straight to interlocked, producing a stripe figure; lustrous
Weight	Moderately Heavy, with air-dry density of 570 kg/m <sup>3</sup>
Durability	Heartwood is moderately durable, prone to buprestid and termite attack. Sapwood liable to powder-post beetle attack
Strength	Medium
Shrinkage (green to oven dry)	Small
Movement In Service	Small
Working Property	The timber works fairly easily with both hand and machine tools
Indication of Forest Availability	The tree grows in other forest parts of Liberia but most frequent in southeastern Liberia.
Historical Production Volume (m <sup>3</sup> )	4.731 (1 piece of log)
Uses	It is very useful for furniture and interior decoration, and forms a good quality joinery wood suitable for ships' cabins and railway coaches. It is also used for boat planking and for the manufacture of veneer and plywood
	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

Scientific Name	Erythrophleum ivorensis
Code	ERY
Family	Leguminosae
Common/ Trade name	Tali (Ivory Coast), Erun, Sasswood (Nigeria), Potrodom (Ghana), Kassa (Zaire), Muave (Zambia), Mwavi (Tanzania), Sasswood tree (general use)
Distribution	Widely distributed in tropical Africa from the west to east coast. The tree is more frequent in evergreen, deciduous, and savanna forests.
Wood	Heartwood is red-, yellow-, or orange-brown, darkening on exposure, sometimes streaked; sapwood creamy-yellow, distinct; texture coarse; grain interlocked or irregular; moderately high luster
Weight	Heavy, with air-dry density of 897 kg/m <sup>3</sup>
Natural Durability	Heartwood is rated as very durable and highly resistant to termite attack; also described as resistant to marine borers
Strength	Strong
Shrinkage (green to oven dry)	Large
Movement In Service	Small
Indication of Forest Availability	The tree grows in all forest areas of Liberia but most abundant in the drier forest zones of the country.
Working Properties	Dry wood is very difficult to saw and machine, rapid blunting of tools, carbide-tipped cutters are suggested; works to a smooth finish and takes a high polish, turns well. Sawdust may cause nose and throat irritation
Historical Production Volumes (m <sup>3</sup> )	2625.779 (777 pieces of logs) 279.720(271 bundles)
Uses	Flooring, heavy construction, railway crossties, harbor and dock work
	
<p style="text-align: center;">Tangential Cells                      Radial Cells</p>	

Scientific Name	Fagara Macrophylla
Code	FAG
Family	Rutaceae
Common/ Trade name	Olon dur (Gabon), Munyenye (Uganda), Fagara (Liberia)
Distribution	Found throughout West Africa, from Sierra Leone to Angola and east to Uganda
Wood	Heartwood bright or pale yellow darkening slightly on exposure; sapwood narrow, somewhat lighter, barely distinguishable. Grain interlocked giving a stripe figure; texture medium to fairly coarse; luster rather high; has a sweet scent when freshly sawn that does not persist
Weight	Very heavy, with air-dry density of 1025 kg/m <sup>3</sup>
Natural Durability	Heartwood durable but not resistant to termite attack, but moderately resistant to pressure impregnation.
Strength	Very Strong
Shrinkage (green to oven-dry)	Small
Movement In Service	Small
Indication of Forest Availability	The tree grows in all forest areas of the country but most abundant in the north western parts of the country.
Working Properties	Generally moderately difficult to work but takes a fine smooth finish, good steam bending properties.
Historical Production Volumes (m <sup>3</sup> )	268.912 (78 pieces of logs)
Uses	Fine furniture and cabinetwork, flooring, paneling, veneer, turnery.



Tangential Cells



Radial Cells

Scientific Name	Khaya anthotheca
Code	KHA
Family	Meliaceae
Common /Trade Name	Munyama (Uganda), Acajou d'Afrique (Ivory Coast), Dubini, Dukuma fufu (Ghana), Ogwango (Nigeria), Acajou-blanc, Khaya
Distribution	It occurs in West Tropical Africa from the Ivory Coast to Angola and eastward through the Belgian Congo to Uganda
Wood	Heartwood light pinkish-brown darkening upon exposure to reddish-brown; sapwood whitish or yellowish, not always sharply demarcated. Texture medium to coarse; grain straight to interlocked, producing a stripe figure; lustrous; brittle heart present in some logs.
Weight	Moderately Heavy, with air-dry density of 560 kg/m <sup>3</sup>
Natural Durability	The heartwood is moderately durable and extremely resistant to preservative treatment
Strength	Medium
Shrinkage (green to oven dry)	Small
Movement in Service	Small
Indication of Forest Availability	Though the tree grows in other forest parts of the country, it is most frequent in the south central forest of south eastern Liberia.
Working Property	It works easily with both hand and machine tools and does not dull cutting edges abnormally
History Production Volume(m <sup>3</sup> )	57.011 (15 pieces of logs)
Uses	The wood is of importance for furniture, paneling, and interior work. It is also used for boat planking, and a high grade of plywood is made from it

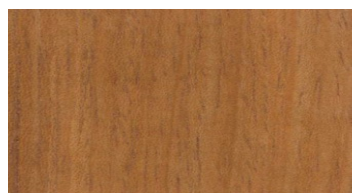


Tangential Cells

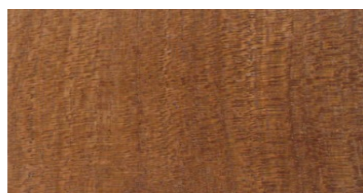


Radial Cells

Scientific Name	Heritiera utilis
Code	TAR
Family	Sterculiaceae
Common/ Trade name	Niangon (Côte d'Ivoire), Ogoue (Gabon), Niangon, Nyankom (Ghana), Whismore (Liberia), Yami (S/ Leone)
Distribution	Endemic to Upper Guinea: Côte d'Ivoire, Ghana, Liberia, S/ Leone
Wood	Wood is pink brown to purplish red brown, wood is oily to the touch. Sap wood: clearly demarcated; 3 to 4 cm thick; Coarse texture with interlocked grain
Weight	Moderately heavy, with air-dry density of 630 kg/m <sup>3</sup>
Natural Durability	Heartwood is rated as nondurable, stake tests show an average service life of only 2 years; not resistant to marine borers.
Strength	Medium
Shrinkage (green to oven dry)	Very small
Movement In Service	Small
Indication of Forest Availability	The tree grows in both moist, evergreen and dry semi-deciduous forests zone of Liberia, but most abundant in the south east of the country.
Working Properties	It is an easy wood to work with hand and machine tools
Historical Production Volumes (m <sup>3</sup> )	9317.947 (2889 pieces of logs)
Uses	Furniture, paneling, flooring, window frames, frames, outside paneling, ship-building, veneer and plywood, structural work, cabinet work, etc.



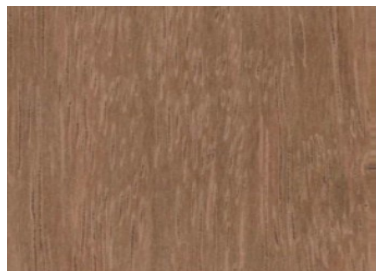
Tangential cells



Radial Cells

Scientific Name	Funtumia elastica
Code	FUN
Family	Apocynaceae
Common/ Trade name	Mutundu, rubber tree, Lagos silk rubber
Distribution	Along the West Coast of Africa, from Guinea to Congo and Uganda
Wood	The sapwood and heartwood are not differentiated; the wood is yellowish white, homogeneous, fine textured, and straight grained, and showing no figure either on flat sawn or quartered material.
Weight	Light, with air-dry density of 512 kg/m <sup>3</sup>
Natural Durability	The timber is not durable, it is subject to sap stain and to attack by stag beetles
Strength	Medium
Shrinkage (green to oven dry)	Medium
Movement In Service	Small
Indication of Forest Availability	It is often found in young secondary forest in Liberia
Working Properties	The wood is easy to work, takes nails and screws well, and can be painted without too much absorption of the oil and varnish.
Historical Production Volumes (m <sup>3</sup> )	N/A
Uses	The timber is used locally for doors and planks because it is easy to work. It has been used for low-cost joinery and furniture

Scientific Name	Gilbertiodendron preussii
Code	GIL
Family	Caesalpiniceae
Common/Trade name	African oak, Red oak (generally used at sawmills), limbali
Distribution	The tree grows along the west coast of Africa, from Sierra Leone to Gabon.
Wood	The heartwood is golden brown with a somewhat reddish tinge. The wood has a low lustre. Texture is moderately coarse. The grain is straight to somewhat interlocked. It is a hard and heavy wood.
Weight	Heavy, with air-dry density of 810 kg/m <sup>3</sup>
Natural Durability	Durable, and moderately resistance to termites
Strength	Moderately strong
Shrinkage (green to oven dry)	Large
Movement In Service	Medium
Indication of Forest Availability	It is found throughout Liberia and is much more frequent in the south east forest zone of the country.
Working Properties	work with both hand and machine tools, and finishing is easy
Historical Production Volumes (m <sup>3</sup> )	30535.682 (7404 pieces of logs) 3.248(23 bundles)
Uses	It is reported to serve very well in boat and ship-building for which it is recommended, and also for construction purposes.

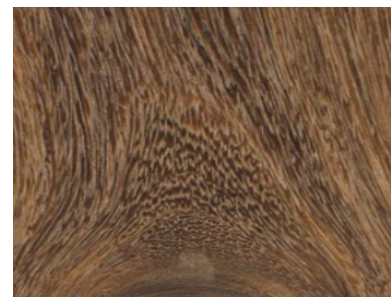


Tangential Cells



Radial Cells

Scientific Name	Haplormosia macrophylla
Code	HAP
Family	Leguminosae-Pap.
Common/Trade name	Black gum (Liberia), Dinankrohia, Larme (Ivory Coast), Idewa (Gabon), Akoti (Nigeria)
Distribution	A nonspecific genus found in western Liberia and in the Ivory Coast.
Wood	The heartwood is light chocolate brown, often with darker streaks and lighter parenchyma markings. It shows a figure on the tangential surface when the wood is properly cut; luster is moderate, and the texture is moderately fine; grain is straight to interlock
Weight	Heavy, with air-dry density of 870 kg/m <sup>3</sup>
Natural Durability	Highly durable; very resistant, even to termites
Strength	Moderately strong
Shrinkage (green to oven dry)	Comparatively Large
Movement In Service	Medium
Indication of Forest Availability	The species is Monospecific genus and its occurrence is only unique to Liberia particularly to the north- western forest parts of the country.
Working Properties	It works fairly well with the proper tools, finishes well.
Historical Production Volumes (m <sup>3</sup> )	34.508 (12 pieces of logs)
Uses	Suitable for piling and for heavy duty saw timbers; widely used locally for furniture & other purposes




Tangential cells





Radial Cells



Scientific Name	Hannoa klaineana
Code	HAN
Family	Simaroubaceae
Common/ Trade name	Hannoa (Effeu)
Distribution	Senegal - Uganda and Angola
Wood	The wood is nearly white or straw colored without distinction between heartwood and sapwood; a rather high luster, no odor, and a slightly bitter taste; texture is medium to coarse, and the grain usually is straight
Weight	340kg/m <sup>3</sup>
Natural Durability	Not durable
Strength	Weak
Shrinkage (green to oven dry)	N / A
Movement In Service	N / A
Indication of Forest Availability	The tree grows in all forest parts of Liberia but most frequent in forests south central of the country.
Working Properties	Easy to work but liable to blue stain unless dried properly.
Historical Production Volumes (m3)	39.669 (9 pieces of logs)
Uses	Locally, it is use for doors, ceilings, carving, and canoes. The wood has no established value on the timber markets.

Scientific Name	Guarea cedrata
Code	GUA
Family	Meliaceae
Common / Trade Name(s)	Bossé (Ivory Coast), Kwabohoro (Ghana), Obobo (Nigeria), Édoucié (Cameroon)
Distribution	Sierra Leone, Liberia ,Guinea ,Uganda and Congo
Wood	Heartwood pinkish-brown, darkening on exposure; sapwood variable in width, pale in color, often well demarcated; texture medium to fine; grain straight, wavy, or interlocked; lustrous.
Weight	Moderately heavy, with air-dry density of 576 kg/m <sup>3</sup> 36
Natural Durability	The heartwood is durable and extremely resistant to preservative treatment
Strength	Medium
Shrinkage (green to oven dry)	Small
Movement in Service	Small
Indication of Forest Available	Found throughout all forest parts of Liberia but frequent in the evergreen forests as well as in the moist semi-deciduous forests of the country.
Working Property	Works fairly well with hand and machine tools, some picking of interlocked grain, slight to moderate blunting of cutters, glues well, takes a good polish and finishing
History Production Volume (m <sup>3</sup> )	67.664 (11 pieces of logs) 16.229 (12 bundles)
Uses	Utilized in veneer for decorative purposes and also in the solid form for furniture, interior trim, and boat construction
	
<span style="display: inline-block; width: 150px; text-align: center;">Tangential Cells</span> <span style="display: inline-block; width: 150px; text-align: center;">Radial Cells</span>	

Scientific Name	Guibourtia Ehie
Code	GUI
Family	Leguminosae
Common / Trade Name	Ehie, Anokye (Ghana), Amazoué, Amazakoue (Ivory Coast), Essingang (Cameroon), Ovang, Kevazingo (Gabon), Waka (Zaire), Bubinga
Distribution	Ivory Coast, Ghana, Southern Nigeria, and Gabon. Prefers closed rain forests and transitional forests, often in small groups
Wood	Heartwood yellow-brown to dark brown with gray to almost black stripes; sapwood yellow-white, clearly demarcated; texture moderately coarse; grain straight to interlocked; attractive figure; unpleasant odor when freshly cut
Weight	Heavy, with air-dry density of 832 kg/m <sup>3</sup>
Natural Durability	Heartwood moderately durable, rarely attacked by termites
Strength	Moderately strong
Shrinkage (green to oven dry)	Large
Movement in Service	Medium
Indication of Forest Availability	The species is found in all forest parts of the country especially in swampy or periodically inundated forests, also near river or lakeshores.
Working Property	Saws slowly but well for its density, works fairly easily with hand and machine tools, planes to a good finish, must be heated before slicing into veneers. May stain when in contact with metal.
Historical Production Volume(m <sup>3</sup> )	N/ A
Uses	Fine furniture and cabinetwork, turnery, decorative veneers, flooring. A walnut-like wood. Yields a gum copal used in pharmaceuticals and as a base for varnishes
 	
<p style="text-align: center;">Tangential Cells <span style="margin-left: 150px;">Radial Cells</span></p> <p style="text-align: center;">49</p>	

Scientific Name	Hallea ciliate (Mitragyna ciliate)
Code	HAL
Family	Rubiaceae
Common / Trade Name	M'Boy (Sierra Leone, Liberia), Bahia (Ivory Coast), Baya, Subaha (Ghana), Elolom (Cameroon), Elelom (Gabon), Vuku, M'Voukou (Zaire), Nzingu (Zambia, Uganda), Abura; Poplar (commonly used in Liberia)
Distribution	Mainly West Africa from Sierra Leone to the Congo region and Angola, gregarious in fresh-water swamps
Wood	Heartwood is uniform light yellowish-or pinkish-brown; sapwood wide, not usually differentiated. Texture fine and even; grain moderately straight to interlock or spiral; luster low; sometimes with gum veins that appear as dark streaks; freshly-cut timber has an unpleasant odor
Weight	Light, with air-dry density of 544 kg/m <sup>3</sup>
Natural Durability	Heartwood is non-durable nor resistant to termites; sapwood liable to powder-post beetle attack.
Strength	Medium
Shrinkage (green to oven dry)	Large
Movement In service	Medium
Indication of Forest Availability	The tree is found in most inland forest swamps of Liberia but most frequent in the wet ever green and moist semi- deciduous forest parts of the country.
Working Property	Works well with both hand and machine tools and takes a good finish if cutters are kept sharp; blunting is slight to severe because of silica; easy to glue; veneers easily.
History Production Volume(s)	1784.697 (459 pieces of logs) 100.552(81 bundles)
Uses	A general-purpose timber; furniture components, joinery, domestic flooring, plywood and carving.