

# LESSER UTILIZED “WOOD” A VERITABLE TOOLS TO SUSTAINABLE FOREST MANAGEMENT IN NIGERIA



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## Abstract

This review assessed the roles of lesser used wood in sustainable forest resources management in Nigeria. It was revealed that lesser utilized tree species are in abundance in the country. They are usually left on forest floors after logging operations to decay and those on agricultural lands are burnt during land preparation. Lack of awareness, insufficient database, inability of people to adapt to changes, inappropriate promotion into wrong end-uses and grading and the irregular or insufficient supplies to wood industries are some of the major problems of lesser utilized wood species in developing countries. Aggressive awareness creation, provision of database on the properties and abundance of lesser utilized species will go a long way to enhance their utilization.

**Keywords:** lesser utilized wood, Database, wood industries, Sustainable forest management

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## Introduction

Nigeria has a total land area of about 923,768km<sup>3</sup> (FGN, 2016). According to FAO (2010), of the land, 9.9 percent or about 9,041,000 ha are forested and 382,000 ha are planted forest. Also, the country is estimated to have lost an average of 409,650 ha or 2.38 per cent of their forest covers per year. The change in the forest cover was estimated to have loss about 47.5percent between 1990 and 2010. According to Mongabay (2020) the Primary forest loss between 2002-2018 was 113,948ha and tree cover loss between 2001-2018 was estimated to be 818,286ha for Nigeria. Part of the proximate divers of this forest loss is population increase and increasing demand for wood and wood products (Patrick, 2016).

The quest to manage Nigeria forest in a sustainable way has been a serious challenge, in the face of illegal logging of forests wood and bad government policies implementation (Owolabi, 2019, Adiji and Adejoba 2019). Sustainable forest management offers a holistic approach to ensure forest activities to deliver social, environmental and economic benefits, balance competing needs, maintain and enhance forest functions now and in the future (FAO, 2020). In other to make effective use of the forest resources to reduce deforestation and continue to meet the demand of wood by wood industries there is need to make use of the nation's wood resources judiciously. According to Akindele (2005) Nigeria is endowed with over 4,600 plant species making the country 11th most biodiverse country in Africa.

Nigeria forests have over 560 tree species, which ranges from 30 to 70 species per hectare. Among the most popular tree species in peculiar to Nigeria includes Iroko (*Melicia excelsa*), Obeche (*Triplochiton scleroxylon*), Mansonia (*Mansonia altissima*), Mahogany (*Entandrophragma cylindricum*), Omo (*Cordia millenii*), Aye (*Sterculia rhinopetalia*), Afara (*Terminalia superba*), Ayinre (*Albizia lebbek*), Danta (*esogordonia papaverifera*), and Abura (*Mitragyna ciliata*). Beak consultants (1999) reported that, of numerous tree species in Nigeria, 60 tree species have been found to be of market value while others are neglected or destroyed during harvesting. Currently, some of the valuable timber species has been overexploited and are fast going extinction and the available are not allow to mature before been harvested.

For us to sustainably utilize the nation wood resources there is need to shift to lesser utilized wood species. Many of the possibly valued trees are being left behind and often simply to be burnt in forest clearing operations like logging, agricultural conversions, road construction, and other construction purposes. Freezaillah (1984), the possibly valued trees are called lesser known species, lesser utilized species, secondary species, unpopular species, non-obligatory species and weed species. This wood species are commercially less accepted species and are not being put to best advantage, which make them to be left in the forest after a logging operation (Oluwadare, 2007).

## Published Works on Some Lesser-Utilized Wood Species

According to Ogunwusi (2013), it was reported that *Azelia africana* and *Anogeissus leiocarpus* are two timber species in Nigeria used in the construction industry. He also classifies *A. africana* as a high grade wood species while *A leiocarpus* as a medium wood species. In its bid to determine the portion of the heartwood, sapwood and bark proportions of the two species along with their wood densities and alcohol benzene soluble extractable

contents. Its result shows that the heartwood ratio in *A. africana* ranged from 44.6% to 75.9% with a mean of 60.9%. The sapwood proportion also varied from 32.5% to 43.6%, with a mean of 28.76%. The bark ratio varied from 5.8% to 12.24% with a mean of 10.20%. The heartwood content of *A. leiocarpus* was a paltry 6.12% while the proportions of the sapwood and bark were 87.80% and 10.77% respectively. The mean densities of the two wood species were 716kg/m<sup>3</sup> in *A. africana* and 731kg/m<sup>3</sup> in *A. leiocarpus*. The mean alcohol benzene soluble extractable content was 2.64% in *A. africana* and 1.82% in *A. leiocarpus*. It also suggested that *A. africana* will be more durable while *A. leiocarpus* is less durable than the former which may require adequate preservative treatment in situations where it will be used for outdoor purposes (Ogunwsi, 2013).

According to Owoyemi (2018) on density and anatomical features *Cocos nucifera* wood, an ever green palm tree which is one of the widely grown tree crop, It was reported that the mean results obtained for the Fibre Length, Fibre Diameter, Lumen Width and Vessel Diameter were 1.49mm, 0.030mm, 0.02mm, and 0.27mm respectively. It also shows that the basic density distribution of *Cocos nucifera* middle, base and top portion has 1107.85kg/m<sup>3</sup>, 1052.67kg/m<sup>3</sup> and 1003.79 kg/m<sup>3</sup> respectively.

Jimoh, (2018) classified three potential timbers grown in Nigeria using EN338 (2009) strength classification for structural size specimen of *Vitex doniana*, *Ceiba pentandra* and *Pseudocedrela kotschy*. The result shows that the equilibrium moisture content (EMC) is 15.70%, 13.71 % and 24.28 % for *Vitex doniana*, *Ceiba pentandra* and *Pseudocedrela kotschy* respectively. *Pseudocedrela kotschy* had the highest density of 813 kg/m<sup>3</sup> followed by *Vitex doniana* 706 kg/m<sup>3</sup> while *Ceiba pentandra* had the lowest density of 402 kg/m<sup>3</sup>. It further assigned *Vitex doniana*, *ceiba pentandra* and *Pseudocedrela kotschy* to strength class D30, C16 and D35 respectively in accordance with EN338(2004).

In a preliminary report on utilization potential of *gliricidia sepium* (Jacq.) Stand for timber by Oluwadare (2007), reported that the mean Moisture Content (MC) of 8.62% was insignificantly lower in the wood nearest the pith, basic density was 1062.7 kg m<sup>-3</sup> nearest the pith than nearest the bark 987.8 kg m<sup>-3</sup> with a mean of 1025.3 kg m<sup>-3</sup>. Tangential (TS) and Volumetric Shrinkage (VS) were significantly higher in the wood nearest the bark with mean of 4.3 and 6.9%, respectively. Mean impact bending was 0.65 m with no significant difference between the wood samples. Modulus of Rupture (MOR) and elasticity (MOE) were significantly higher (153.8, 7678.1 Nmm<sup>-2</sup>) nearest the pith than 85.8 and 5580.21 N mm<sup>-2</sup> for wood nearest the bark respectively.

## Challenges of Lesser Utilized Wood in Nigeria

### Awareness Creation

According to an Anonymous in 2019, Centres for Wood Research through their continuous work since in the 1990s, the physical, mechanical and aesthetic characteristics of most of the lesser-known regional species have been described. Though this method intensify knowledge base of these species but proved to be inadequate to promote their use. This day, other than the lack of information that needs to be identified, the theoretical knowledge about the characteristics of wood is no longer the central problem. However, it is expected to update the data according to the current protocols. As far as Nigeria is concern there is no or little awareness on the use of lesser used/known wood species.

### Lack of Database for Lesser Utilized/Known Wood Species

Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information. A database management system is important because it manages data efficiently and allows users to perform multiple tasks with ease. The lack of database management is not only peculiar to lesser utilized wood species in Nigeria. It is a major problem in forestry management which is affecting the proper planning and management of forestry. Although, there exist some research work on the properties of lesser utilized wood species but there is need to compile this report and compare their properties with choice wood for proper use by end user.

### Inability of Man Adapting to Change

Man naturally are difficult to adapt to changes unless the security and fear on the subject matter are removed. Although, most of all the commercially known wood species has been heavily harvested and some are going into extinction, wood user want to know what will happen to the lesser utilized wood in service. Cultural believe also contribute to difficult of people to use lesser utilized because of the previous knowledge of known commercial wood species. According to Hines and Eckman (2008), local people often prefer indigenous species for a variety of uses such as charcoal, furniture, house construction material and medicine. This is due to the fact that little or no emphasis is put on wood properties required for their end uses and the use of wood from the species without good knowledge of their properties may result in safety hazards and inefficient utilization (Mahonge and Hamza, 2001). According to Smith and Eastin (1990), research in the area of new species introduction indicates that raw material preferences within the international timber trade are slow to change and calls for intensified and calculated marketing efforts to reverse this trend.

### **Inappropriate Promotion into Wrong end-uses and Grading:**

The lack of necessary information of most of the properties of lesser known/utilized wood, has led to being market into wrong end uses due to scarce wood resources. In as much they are put to wrong end use, this is a major cause of their failure in service. It is very important to consider the chemical, mechanical, physical, anatomical and durability properties of lesser known/utilized wood before they are put to use. Timber grading is also an essential step into the value process to determine wood usability for structural uses. It requires well-described characteristics obtained easily by taking non-destructive measurements to quantify reliable indicators of mechanical properties (Agnès et al, 2019).

### **Irregular or Insufficient Supplies to Wood Industries**

The fair of irregular or insufficient supplies is making forest products manufacturers and export customers to generally be reluctant to accept substitutes for traditional species (Poku 1999). Also according to Freezaillah (1984), present conditions now are not conducive to the utilization and supply of the lesser utilized/known wood species especially in the following cases agri-conversion and related development of forested land; inundation of forested land due to construction of dams; conversion of natural forests into forest plantations and low logging out-turn, particularly in many tropical American (8.4 m<sup>3</sup> per ha) and African (13.5 m<sup>3</sup> per ha) countries.

### **Way Forward**

#### **Awareness**

Provision and dissemination of information about the properties of Nigeria lesser utilized/known wood species to wood industries, in the face of challenge to meet the demand for wood by wood industries and users. A successful promotion and utilization of Lesser-used species (LUS) will yield a relief and reduce demand on the few primary species. But the efficient utilization of the lesser-used wood species depends on knowledge of properties such as their durability, water sorption behavior among others need to be disseminated (Gladys, 2009). According to FAO report by Freezaillah, Information on the resource base, inputs from research and development, systematic and aggressive marketing and, above all, cooperation between consumers and producers are vital and implicit in the steps to be taken. Certainly there is a need for adequate knowledge and information about the resource base in order to be able to classify the LKS into abundant and sparse species.

### **Provision of Database for Lesser Utilized/Known Wood Species in Nigeria**

Establishment of database for the properties of the lesser utilised/known wood species will help in promoting their utilization. Wood industries and user will have the confidence to use the lesser utilised/known wood species when they know more about the species. Scientific information on the natural durability, anatomical properties, sorption behavior, and mechanical properties need to be provided. Also a reliable knowledge of wood anatomical properties and the behavior of wood under stress are essential for engineers, architects, and carpenters in order to use timber more efficiently. As it play an important role in selecting the proper wood for particular usage because it affects strength properties, appearance, resistance to preservative treatment, and resistance to decay (Gladys, 2009).

### **Enhancing the Properties of Lesser Utilized Wood**

Research has showed that some of the lesser utilized wood are not very durable while other are durable which is factor of their density class. (Gladys, 2009, Adiji and Owoyemi, 2015). Some wood are naturally durable. Natural durability of wood is the term for its resistance against the attack by wood-decay organisms, such as fungi, insects or marine organisms. The European Standard EN 350 serves as a guideline for determining natural durability or for allocating natural wood species to durability classes as very durable, durable, moderately durable, little durable and non-durable. The classification were done based on the service life; very durable has 25years above while durable, moderately durable, little durable and perishable wood are within 15-25, 10-15, 5-10 and less than 5 years respectively. Wood species belonging to the non-durable class are not generally suitable for use in construction works and cannot withstand damp environment or last long when in contact with the ground. Wood is exposed to numerous biological deteriorations in different environments. According to Adiji and Owoyemi (2015), irrespective of the durability class of wood should be treated before use in service. Enhancing the properties of wood to withstand bio- deteriorating agent and also strength properties of wood.

### **Conclusion**

Lesser utilized/known wood species is one of the way that can help to meet demand by wood industries and wood user and also help to manage the forest estate in a sustainable way by harnessing them well, that is, when they are well harnessed. Inasmuch that lesser utilized/known wood species are in much abundance in Nigeria and are being allowed to be wasted, their promotion into effective use will go a long way to reduce the pressure on the nation's forest estate.

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