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Checklist and Ethnobotanical Knowledge of Timber Species in Bayelsa State, Nigeria

Kayode J[1], Ihinmikaiye SO[2], Arowosegbe Sunday[1] and Oyedeji Ayodele[3]*

[1]*Department of Plant Science and Biotechnology, Ekiti State University, Ado-Ekiti, Nigeria*

[2]*Department of Biology, Federal University, Otuoke, Nigeria*

[3]*Department of Biological Sciences, Niger Delta University, Wilberforce Island, Nigeria*

Abstract

An appraisal of the ethnobotanical knowledge of the timber species in Bayelsa State, Nigeria, was carried out with the aid of a semi structured questionnaire guide. Five communities were selected from each of the eight Local Government Areas of the state, making a total of 40 communities used for the study. Ten respondents were randomly selected from each of the community, thus constituting 400 respondents in all, and were interviewed with the questionnaire guide. Group interviews were also conducted among the respondents to determine group consensus on the responses obtained during the individual interviews. The interviews were aimed at the determination of the timber species used in the study area, their abundance status and the ethnobotanical knowledge of the respondents on the identified timber species. The study revealed that respondents were quite familiar with the demography, ecology and physiology of the timber species in their environment irrespective of the socio-economic class they belong to. A total of 63 timber species, belonging to 28 families, were identified in the state. Field observation revealed that the choice of a species as source of timber was based majorly on the species' durability, resistance to insects (especially termites), and liability to soft rot and fungi attacks. The abundance scale used in this study revealed 13% of the identified timber species were of rare status. The indigenous knowledge of the native respondents on the identified rare species revealed that respondents were familiar with their growth forms, preferred habitats, methods of propagation and products derivable from the species. All the rare species were trees that thrive well in swamp forest of the study area and were capable of propagation from seeds. The transplantations of their wildlings were equally identified as a means of propagating them. The identified rare species have multipurpose utilities in the study area. Strategies that could conserve the rare species in the study area were proposed.

Keywords

Timber, Exploitation, Conservation, Forest, Bayelsa state

Introduction

Forest house an often complex array of resources, including woody and non-woody forest products, utilized by man. Nearly half (44%) of the world's forest cover lies in the tropics [1], indeed, the African forest contain a wide diversity of timber species on which more than one billion people depends to varying degrees for their livelihood [2]. However, inimical exploitation of forest resources, especially timber species, obviously reduced species diversity of the tropical rainforests. Study by Franccesa, et al. [3] revealed that forests in the tropical zone are the most hardly hit and gravely threaten. Thus, the indigenous timber species inherent in the tropical forest are recurrently disappearing from the wild.

In Bayelsa State, Nigeria, the rate of timber exploitation is inappropriate. Previous study of Ihinmikaiye and Okpo [4] revealed that forest communities in the region are rich in tree species, but the distribution now skewed with respect to the intermediate class. Obute and Ekiye [5] highlighted the implications of forest fragmentation and over harvesting leading to the depletion of vegetation resource base, and consequently the loss of the knowledge about useful floral species along with their ethnobotanical applications in State. In Ndukwu and Ben-Nwadibia [6] a total of 24 species belonging to 10 different families were found to have varying applications in ethnobotany: The studies indicated that the indigenous

***Corresponding author:** Ihinmikaiye Samuel Olatokunbo, Department of Biology, Federal University, Otuoke, Nigeria, ORCID iD: 0000-0001-9793-6224

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people have also developed different methods for collecting, processing, using and conserving these valuable plants and/or their products. Kayode, et al. [7] reported an increasing decline in the availability of timber species used for carving due to the annihilative method employed for harvesting the species. Many of the timber species have been over-exploited as a result of illegal logging among the indigenous people and the increasing rates of industrialization and urbanization in the State. Moreover, incessant demands by firewood seekers and woodcarvers as well as environmental pollution by crude oil pollution and pipeline vandalism have combined effects on the biodiversity and resilience of forest ecosystems of the region. Though, forests in the State still appear luxuriant because of the year- round rainfall with prevalent wetland terrain, and the fact that new leaves grow continually yet this cannot be taken to mean that the forest is still intact [8,9]. Recent initiative as suggested by some authors [10-12] advocate the introduction of the use of local practices, beliefs, myths and taboos into forest conservation programme. However, factors such as the presence of other tribes, new religions/westernization and poverty pose a threat to the effectiveness of such practices as a conservation tool. Thus, the present trend of timber exploitation in Bayelsa State has assumed unprecedented large scale devastation, with little thought for sustainable forest timber utilization. Kayode [13] stressed the fact that continued timber removal without the corresponding replacement within the forest is a major factor that could lead to biodiversity lost. Hence, this study aimed at assessing and documenting information about existing timber species found within the forest ecosystem of Bayelsa state, determine the ethnobotanical knowledge on them, their abundance status and suggest conservation strategies that could lead to their sustainable supply in the state.

Materials and Methods

Kayode, et al. [7] has provided the details of ecology and climate of the study area. The state was divided into three zones based on the existing political delineation as Bayelsa West (BW), Bayelsa Central (BC) and Bayelsa East (BE). Each of BC and BE zones is made up of three Local Government Areas (LGAs) while BW zone possessed two LGAs. Five communities were selected from each LGA, making a total of 40 communities used for the study. Ten respondents were randomly selected from each of the community, thus constituting 400 respondents in all, and were interviewed with the aid of semi structured questionnaire guide. The interviews were aimed at the determination of the timber species used in the study area, their abundance status and the ethnobotanical knowledge of the respondents on the identified timber species. Group interviews were conducted in each community in order to established group consensus on the identified species. Each group was made up of at least three respondents. Three group interviews were conducted in each village. Key informants, made up of sawmill workers, plank sellers and carpenters were identified in each zone and were also interviewed. Secondary information was also obtained from journals and books especially Hutchinson and Dalziel [14], Keay, et al. [15] and Nyananyo [16].

The similarity measures in the species identified by respondents in the different zones were determined as follow:

i. Index of Similarity (IS); as reported by Kayode [17] as:

$$IS = \frac{2c\,'100}{(a + b)}$$

ii. Sorensen and Dice similarity index (S_s) according to Magurran [18] as:

$$S_S = \frac{2a}{(2a+b+c)}$$

iii. Jaccard's index (S_j); as stated by Hubalek [19] as:

$$S_j = \frac{a}{(a+b+c)}$$

iv. Kulczynski index (IK); as stated by Hubalek [19] as:

$$IK = \frac{\frac{a}{a+b} + \frac{a}{a+c}}{2}$$

v. Asymmetrical Similarity (S_{AS}) as stated by Gurevitch, et al. [20] as:

$$S_{AS} = \frac{b}{(b+2c)}$$

Where

a is the number of timber species identified in one zone

b is the number of timber species identified in another zone

c is the number of identified timber species common to both zones.

The indices are useful for ecological community, they have been proposed to measure the degree to which species composition of sample sites is alike [21]. They are used here to compare similarity in the three senatorial zones in terms of their timber tree species content and or the degree to which the timber species' composition of the zones is alike base on their presence or absence in the zones. Incidence-based measures of (relative compositional) similarity are based only on the presence or absence of species. Similarity index is express in percentage, it's based on presence (not abundance) of timber tree species in compare zones, it determines how closely the timber commonly resembles in the compared zones and it exploits information on all species not only the shared species. Jaccard and Sorenson-Dice indices compare regional floral, it measure the strength of association on a zero to one (0-1) scale. Zero does not indicate association and 1 indicate maximum positive association. Kulczynski index describe the dissimilarity between the species occurring in the zones, it values range from 0 to 1, with the value 1 taking place when the species co-occur. Asymmetry index measures the ratio of skewness to the standard error. It is an indication of the asymmetry of a distribution [22].

The relative abundance of the identified timber species was determined based on the information supplied by the respondents. Consequent on the identification of the rare species, the communities sampled were revisited and

Table 1: Demographic character**,** socio-economic status of respondents and location of the villages studied in the three senatorial districts of Bayelsa State, Nigeria.

Variables		BW	BC	BE	Average
Sex	Male	72	69	71	71
	Female	28	31	29	29
Age	< 20	28	13	20	20
	20-65	52	71	65	63
	> 65	20	16	15	17
Religion	Christian	82	88	88	86
	Moslem	-	-	-	-
	Others	18	12	12	14
Literacy Status	Literate	64	63	65	64
	Illiterate	36	37	35	36
Economic Status	Low	66	68	77	70
	Medium	30	32	19	27
	High	4	-	4	1
Occupation	Farming	94	79	88	87
	Non-Farming	6	21	12	13

five respondents were selected in each community. The Indigenous Knowledge (IK) of the selected respondents on the identified rare species was determined and used to propose conservation strategies the species in the study area.

Visits were also conducted to forest reserves in the State and the extent of anthropogenic disturbances in each reserve were observed and recorded.

Results

The demographic and socioeconomic status of respondents was shown in Table 1. 71% of the respondents were males, of between the ages of 20-65 years (63%), Christian (88%), literates (64%) farmers (86.9%) and mostly of low economic status. Field observation revealed that they were conversant with the timber species in their environment. A total of 63 timber species belonging to 28 families were identified in the three senatorial zones of the State (Table 2). 59, 54 and 58 timber species were identified in BC, BE and BW respectively.

Table 2: Botanicals used for timber among the major ethnic groups in Bayelsa State.

S/N	Botanical names	Families	Local names	Availability status	Indigenous Knowledge
1	*Alstonia congensis*	Rubiaceae	Kigbe	Rare	Soft and light
2	*Alstonia macrophylla*	Apocynaceae	Obori	Rare	It's of superior quality, less liable to attack by insects
3	*Anopyxis klaineana*	Rhizophoraceae	Beni-tobutobu	Abundant	Hard, resist termite attack
4	*Anthocleista djalonensis*	Pandaceae	Sokoroko, Osunwa	Very Abundant	Availability, is a strong wood, termites proof & durable
5	*Anthocleista vogelii*	Pandaceae	Osunwa	Very. Abundant	Medium hard, keep well
6	*Antiaris toxica*	Moraceae	Alalawa	Abundant	Hard, availability
7	*Astonia bononei*	Apocynaceae	Kigbo	Abundant	Soft, easy to saw, good for light furniture and carpentry work
8	*Aubrevillea platycarpa*	Mimosaceae	Piri agbaka	Frequent	Hard, durable, soft rot resistance
9	*Avicennia germinans*	Acanthaceae	Ekeu	Abundant	Hard, durable
10	*Brachystegia nigerica*	Caesalpiniaceae	Okolodo	Occasional	Resist soft rot and decay
11	*Ceiba pentandra*	Bombacaceae	Talar	Frequent	Light weight easy to work, resist decay
12	*Combretodendron macrocarpum*	Lecythidaceae	Ozen	Rare	Fairly hard, durable
13	*Ctenolophon englerianus*	Ctenolophonaceae	Yowei tin	Abundant	Hard, durable, resist dry borer
14	*Dennetia tripetela*	Annonaceae	Piri tin	Abundant	Soft, good for casual woodwork
15	*Entandrophragma cylindricum*	Meliaceae	Aboudikor	Rare	Medium hard, keep well
16	*Entandrophragma excelsum*	Meliaceae	Ohor	Occasional	Heavy, durable
17	*Erythrina senegalensis*	Papilionaceae	Ogbolo Ibolo	Abundant	Hard, durable
18	*Erythrophleum ivorense*	Caesalpiniaceae	Eren	Frequent	Hard, resist decay, fungi and termite attack
19	*Erythrophleum suaveolens*	Caesalpiniaceae	Eren	Frequent	Durable
20	*Funtumia elastica*	Apocynaceae	Orobatin, Silk rubber	Frequent	Soft, easy to work on.
21	*Garcinia kola*	Clusiaceae	Okan	Abundant	Fairly strong, termites proof, good for carpentry
22	*Gmelina arborea*	Verbenaceae	Epele	Abundant	Light weight, hard and durable
23	*Gossampinus angulicarpa*	Bombacaceae	Esisagha, Sikaka	Frequent	Hard, resist rot & decay, termites proof
24	*Hevea brasiliensis*	Euphorbiaceae	Roba tin	Abundant	Availability, use for casual work

25	*Irvingia gabonensis*	Irvingiaceae	Okpukpa	Very abundant	Availability, durability, strong wood with good working qualities
26	*Irvingia smithii*	Irvingiaceae	Bakalaza tin	Abundant	Workable
27	*Khaya anthotheca*	Meliaceae	Ipelemu	Frequent	Highly valued for furniture & carpentry, with good qualities, termites proof, easy to work on
28	*Khaya ivorensis*	Meliaceae	Digi tin, Kow	Frequent	Soft, easy to work on. Durable
29	*Klaindoxa gabonensis*	Ixonanthaceae	Akoo	Abundant	Strong, durable, termite proof
30	*Laguncularia racemosa*	Combretaceae	Orke	Very abundant	Moderately hard and heavy
31	*Lophira alata*	Ochnaceae	Kuru	Abundant	Hard, suitable for furniture
32	*Mammae Africana*	Guttiferaceae	Bolo tin	Occasional	Hard, termite proof and durable
33	*Mansonia altissima*	Malvaceae	Ozon	Rare	Light weight, yield attractive plywood, easy to work on and durable
34	*Milicia excels*	Moraceae	Alagbatin, Olokpata	Rare	Hard, yield plank wood, resist insects attack
35	*Mitragyna stipulosa*	Naucleaceae	Bau	Occasional	Hard, workable, durable
36	*Monodora myristica*	Annonaceae	Okogolo	Abundant	Hard, Easy to work, insects' resistant. Suitable for carpentry
37	*Musanga cecropioides*	Urticaceae	Obonya tin	Very abundant	Soft, easy to work on
38	*Nauclea diderrichii*	Rubiaceae	Owoso	Occasional	Strong, durable, resist insects attack, respond well to sawing operations
39	*Nesogordonia papaverifera*	Malvaceae	Ikpalata	Abundant	Hard, easy to work on, durable, accept nail and screw easily
40	*Pachystela brevipes*	Melastomataceae	Ayanya, Adayan	Abundant	Strong, resist rot and decay
41	*Panda oleosa*	Pandaceae	Obiritia	Abundant	Availability easy to saw and work on
42	*Pentadesma butyracea*	Clusiaceae	Akanti	Frequent	Heavy, resist termites attack. Durable
43	*Piptadeniastrum africanum*	Mimosaceae	Sanga	Occasional	Hard, resistance to fungi and insects. Easy to work on
44	*Prioria mannii*	Caesalpiniaceae	Itofiya	Abundant	Resist dry wood borer, fungi and termite
45	*Pterocarpus mildbraedii*	Papilionaceae	geneghar	Abundant	Hard resistant to insect, easy to work on
46	*Pycnanthus angolensis*	Myristicaceae	Abbo	Abundant	Soft, availability, easy to work on
47	*Rhizophora harrisonii*	Rhizophoraceae	Angala	Very abundant	Strong, attractive as plank
48	*Ricinodendron heudelotii*	Euphorbiaceae	Eke	Frequent	Light, soft, easy to work on
49	*Sacoglottis gabonensis*	Houmiriaceae	Tala	Abundant	Soft, easy to work on
50	*Scottellia klaineana*	Achariaceae	Ewonoh	Rare	Fairly hard, susceptible to fungi attack
51	*Symphonia globulifera*	Clusiaceae	Akololo	Abundant	Ideal for fine furniture work, strong, durable, rot resistant easy to work on
52	*Terminalia acuminate*	Combretaceae	Oweibalaa, abalaa	Abundant	It yield good plank, strong & easy to work on
53	*Terminalia ivorensis*	Combretaceae	Turubainmo, ambe, sebe tin	Frequent	Workable, easy to saw, good for furniture work
54	*Treculia Africana*	Moraceae	Oyen, okorien	Very abundant	Availability, suitable for furniture making, durable
55	*Triplochiton scleroxylon*	Sterculiaceae	Phar	Rare	Hard, light weight, attractive durable
56	*Uapaca guineensis*	Uapacaceae	Ilee	Abundant	Hard and durable
57	*Uapaca heudelotii*	Uapacaceae	Iyoro ile	Abundant	Fairly hard, resist termites and insects attack
58	*Uapaca staudtii*	Uapacaceae	Okuruba ile	Abundant	Termite proof, durable
59	*Vitex doniana*	Verbenaceae	Moron	Abundant	Strong, durable, easy to work on
60	*Vitex grandifolia*	Verbenaceae	Buran-furu	Abundant	Resist termite attack

Field observation revealed that the choice of a species as source of timber was based majorly on the species' durability, resistance to insects (especially termites), and liability to soft rot and fungi attacks. Table 3 revealed that the species identified in the different zones were quite similar to one another. The similarities can be expressed as:

BW-BC > BE-BC > BE-BC

The abundance scale used in this study revealed that 12%, 47%, 18%, 10% and 13% of the identified timber species were of very abundant, abundant, frequent, occasional and rare status respectively. The indigenous knowledge of the native respondents on the identified rare species revealed that

Table 3: Similarity measures on the occurrence of timber species in the three zones of the study area.

Zones	Indices of Similarity*				
	IS	S_J	S_{SD}	S_O	S_{AS}
BW-BE	89.1	0.3	0.5	2.5	0.3
BW-BC	95.7	0.3	0.5	2.6	0.3
BE-BC	91.9	0.3	0.5	2.5	0.3

*Size according to secondary information.

respondents were familiar with their growth forms, preferred habitats, methods of propagation and products derivable from the species (Table 4). All the rare species were trees that thrive well in swamp forest and capable of propagation from seeds. The transplantations of their wildlings were equally identified as a means of propagating these species. All the identified rare species have multipurpose utilities in the study area. Thus, apart from their use as timber, they were also

Table 4: Conservation inference of the respondents' indigenous knowledge on the rare species.

S/n	Feature	Identified Rare Species	Respondents' Indigenous Knowledge	Conservation Inference
1	Growth Form	*Alstonia congensis*	Tree	Respondents are quite familiar with trees hence an enlightenment campaign on the importance of trees that necessitates tree cultivation by the aboriginals is required.
		Alstonia macrophylla	Tree	
		Combretodendron macrocarpum	Tree	
		Entandrophragma cylindricum	Tree	
		Mansonia altissima	Tree	
		Milicia excelsa	Tree	
		Scottellia klaineana	Tree	
		Triplochiton scleroxylon	Tree	
2	Habitat	*Alstonia congensis*	Rainforest, Swamp forest	The swamp forest vegetation of the study area will support the cultivation of most of the rare species.
		Alstonia macrophylla	Rainforest, Swamp forest	
		Combretodendron macrocarpum	Rainforest, Savannah	
		Entandrophragma cylindricum	Swamp forest, Rainforest	
		Mansonia altissima	Rainforest, Savannah	
		Milicia excelsa	Forest Island, Rainforest, Derived savannah	
		Scottellia klaineana	Swamp forest, Rainforest	
		Triplochiton scleroxylon	Rainforest	
3	Propagation	*Alstonia congensis*	Seeds, Wildlings	(a) Respondents could be encourage to preserve wildlings of these species in their farms. (b) The aborigines' familiarity with seeds propagation could be exploited through provision of seeds and/or seedlings of these species for cultivation in the study area.
		Alstonia macrophylla	Seeds, Wildlings	
		Combretodendron macrocarpum	Seeds, Wildlings	
		Entandrophragma cylindricum	Seeds, Wildlings	
		Mansonia altissima	Seeds, Wildlings	
		Milicia excelsa	Seeds, Wildlings	
		Scottellia klaineana	Seeds, Wildlings	
		Triplochiton scleroxylon	Seeds, Wildlings	
4	Major Products	*Alstonia congensis*	Timber, Medicine, Shade	Investment in these species will meet future needs of respondents and provide worthwhile economic returns.
		Alstonia macrophylla	Timber, Furniture	
		Combretodendron macrocarpum	Timber, Medicine, Fuel	
		Entandrophragma cylindricum	Timber, Medicine	
		Mansonia altissima	Timber, Medicine	
		Milicia excelsa	Timber, Medicine, Shade	
		Scottellia klaineana	Timber, Medicine	
		Triplochiton scleroxylon	Timber, Medicine, Foods	

Table 5: Forest reserves in Bayelsa state, Nigeria.

S/n	Reserve	Size	Main LGA**	Observed Anthropogenic factors*
1.	Apoi Creek Forest Reserve	64.77 km^2	Southern Ijaw	H, L, OE
2.	Bayelsa National Forest	NA	Yenagoa	H, L
3.	Edumanon Forest Reserve	86.76 km^2	Ogbia, Nnebe	H, L, OE, PD
4.	Egbedi Creek Forest Reserve	66.32 km^2	Kolokuma/Opokuma	H, L
5.	Ikibiri Creek Forest Reserve	191.71 km^2	Southern Ijaw	H, L, F
6.	Nun River Forest Reserve	97.15 km^2	Southern Ijaw, Yenagoa	H, L, F
7.	Taylor Creek Forest Reserve	218.91 km^2	Yenagoa	H, L

NA: Not Available; **The main location(s) (LGA), where the forest is domicile; *H: Hunting; L: Logging, OE: Oil Exploration; F: Farming; PD: Plantation Development.

used for medicine. Table 5 revealed that five forest reserves abound in the study area. These reserves were heavily preyed upon by anthropogenic factors especially hunting, logging, oil exploration and farming activities. Field observation revealed that while the Niger Delta University is located at the fringing forest of Nun River Forest Reserve, an expansion of *E. guineensis* plantation was on-going in Edumanon Forest Reserve hence these reserves are diminishing rapidly. Similarly, oil exploration pipelines were observed at Apoi Creek and Edumanon Forest Reserves. Thus, the populations of an array of trees in the reserves are being threatened.

Discussion

The indigenous community of the study area maintained verse knowledge on the utility values of plant species in their environment. The awareness demonstrated on timber species cut across the socio-economic strata thus affirming the previous contention of Kayode [23] that socio-economic classifications were not prerequisites to tree mindedness of the indigenous people. The indigenous people derived numerous products from the forest in their environment. Inyang [24] asserted that the entire Niger Delta region of Nigeria is richly blessed with a variety of natural resources, especially forest resources of immense economic potentials. A total of 63 indigenous timber species, belonging to 28 families were identified in this study. This figure fall within that of Gill and Okoegwale [25] who documented 74 timber species as number of indigenous timber in Nigeria, The indigenous knowledge of the respondents on the identified species included their texture, durability and susceptibility to fungi and pests. Thus, the desirable characters that a species possessed were used to determine its suitability for a particular wood product. This observation tends to support the previous assertion of Bloniarz [26] that the intended utility dictates the timber species to be used. Researchers such as Kayode [13], Adekunle, et al. [27] and Adekunle, et al. [28] have shown that people always prefer to use species that are of superior quality and high economic value. The various similarity indices used in this study tend to suggest similarities in the diversity of the identified species in the tree different zones of the study area. Cantlon [29] contended that areas with similar microclimate will support the same type of plant species. The respondents also demonstrated considerable knowledge on the ecology and physiology of the identified species. Gadgil, et al. [30] asserted that Indigenous peoples with a historical continuity of resource-use practices often possess a broad knowledge base of the behavior of complex ecological systems in their own localities. They contended further that this knowledge has accumulated through a long series of observations transmitted from generation to generation. The respondents in this study were equally versed in the demography of the identified timber species. Those that were rare in occurrence were identified and the rare species were found to be trees capable of being cultivated in the study area. Thus, the application of the knowledge-practice-belief complex of indigenous peoples relating to conservation of biodiversity, as previously advocated by Gadgil, et al. [30] becomes relevant. The indigenes of the study area were quite familiar with trees and with propagation from seeds. Thus, an awareness campaign on the need to plant indigenous tree species might likely produce a promising result. Similarly, preservation of tree wildlings of the identified species could be encouraged. The identified species have multiple utilities in the study area. This might constitutes a veritable incentive to their cultivation by the indigenous community.

The existing forest reserves were presently prone to deforestation through hunting, logging, oil exporation and plantation development and farming. Hunting was prominent in the study area to the extent that a wildlife market abounds in Yenagoa, the state capital. The market-Swali Market-is situated in close proximity to five of the existing forest reserve. The trade in wildlife breeds poaching while the reckless use of firearms in these forest reserves hindered forest policing activities by forest guards. Akani, et al. [31] observed that the thriving wildlife market in Swali Market could be attributed not only to its closeness to the reserves but also its accessibility by good roads and water. The market is located on the shore of the River Nun. Similarly, Hamadina, et al. [32] asserted that the ongoing and future development project at the campus of the Niger Delta University shall have significant adverse impacts on the Nun River Forest Reserve directly through habitat loss/fragmentation, nuisance, influx of people; and indirectly by exacerbating the existing threats. At present logging activities are being carried out indiscriminately and mostly illegal in all these reserves. The reserves in the study area are further damaged by plantation establishment such as the expansion of oil palm plantations in Edumanom Forest Reserve, the oil pollution arising from the oil exploration activities. Oil pollution cause depletion of oxygen, reduce plant growth [33], increased defoliation and yellowed leaf colour in mangrove [34]. Mangroves are now known to be slow growing and take decades to be replaced by mature vegetation. Hoff [35] revealed that mangrove does

not recover quickly from oil pollution.

In conclusion, this study revealed that respondents were aware of the continuous erosion of timber species in the study area thus confirming the previous observation of LENF [36]. Preference for timber species is presently skewed toward the species that were available rather than the choice species thus lending credence to a similar observation made by Kayode [13]. Consequent on this observation the need to halt the present trend of deforestation in the study area is inevitable. Government should embark on community based forest management scheme. The existing laws on forest management are obsolete; they should be reviewed and made more effective. Also, personnel of forestry department should be well-equipped and mobilized for efficient and effective forest monitoring. Pollution, mostly arising from oil bunkering activities should be controlled. Public awareness campaigns should be embarked with a view to enumerating the dangers involved in the genetic loss of the indigenous timber species. Perhaps some of the existing forest formations in the state should be dedicated to sprits and deities. LENF [36] previously asserted that the native laws have been successful in preserving these 'evil forests'. Studies have shown that people respect the traditional laws and obey traditional rules and regulations. The use of such ancient conservation rules and practices has been used effectively elsewhere in some climes [37].

Authors' Contribution

S. O. Ihinmikaiye and J. Kayode carried out the field enthobotany research and draft the manuscript. S. Arowosegbe participated in the study inception, contributed to the draft of the manuscript. A. A. Oyedeji participated in the field research and helped to confirm the timber species determination. All authors read and approved the final manuscript.

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