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Original Article

Survey of tree species processed by sawmills in south-south zone of Nigeria

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ABSTRACT

The south-south zone of Nigeria, enriched with rain forest with choice timber species, has numerous sawmills. Tree species processed in sawmills depend on their uses within the locality. Hence the study surveyed tree species processed in sawmills and their uses in the south-south zone of Nigeria. Twenty sawmills each were randomly selected from Akwa Ibom, Bayelsa, and Delta States in the South-South zone of Nigeria. Data on the socio-economic profile of sawmillers, timber species processed, dimensions, and uses were obtained using a structured questionnaire. Data was analyzed using descriptive statistics such as frequencies, means, and percentages. Most of the sawmillers were male (93.3%), with a mean age of 43.0±0.98, married (96.7%), with mean years of experience of 15.3±0.89 and a capital base of 9190000±505471.2. *Daniella olivera* was the most sawn and *Ricinodendron heudolotii* (35.0%), *Chrysophyllum albidum* (50.0%), and *Lophira alata* (45.0%) were the least sawn in Akwa Ibom, Bayelsa and Delta State, respectively. In the south-south zone of Nigeria, *Daniella olivera* (96.7%) and *Ricinodendron heudolotii* (11.7%) were the most and least sawn, respectively. These species were processed and used for construction and furniture work. Numerous species are exploited and processed by sawmills in the South-South zone of Nigeria. Investment in private plantation establishments, afforestation, and sophisticated processing machines is paramount for the sustenance of forests and sawmills in the South-South zone of Nigeria.

K E Y W O R D S : *Forest, Timber processing, Trees, Utilization*

INTRODUCTION

Nigeria's vegetation is broadly grouped into two, forests and savanna located in Southern and Northern region respectively. Southern Nigeria forests are categorized into mangrove, freshwater swamps and tropical rainforest which serve as habitat for various hardwood species (Olorunnisola, 2023). With population expansion and development comes increased demands for forest products. Thus, the forest is being looted encouraging deforestation (Adediran *et al*., 2016). Deforestation is precarious to lives and properties as forest protective service is destroyed in the process. It is of major interest in developing countries (Chakravarty *et al*., 2011) due to rapid depletion of biodiversity and reduction in their forest areas (Ohwo *et al*., 2020).

South-South zone of Nigeria was massively enclosed by rainforest in year 1500 which significantly reduced rapidly over the years (Olowokudejo and Oyebanji, 2016). The reduction in rainforest stems from exploration, processing, spillage and utilization of fossil fuel (Nigeria

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part to sustainable development through green economy, country report to the Rio+ 20, 2012). Olowokudejo and Oyebanji (2016) reiterated that above half of 9.6 million ha of rain forests in Nigeria was used to carter for fuel wood needs in city and village neighborhoods. Furthermore, the establishment of African Timber and Plywood, (AT& P) in Sapele, Delta State and the lucrative nature of sawmilling milling business led to installation of numerous small-scale mills in the south which intensified extensive exploitation of forest trees. In 2010, the rain forest zones harbored 945 out of the 1325 sawmills that existed in Nigeria especially in Edo, Delta, Ondo, Ogun, Oyo, Osun, Cross River States (Ogunwusi, 2012).

Sawmills is most dominant and highly commercial in the south creating job, income (Ohwo and Adeyemi, 2015), energy (Okunomo, 2010) and sustaining livelihood (Ohwo and Ogoha, 2017). The forest thus is burdened with log supply to sawmill for both domestic and external consumption (Larinde and Erakhrumen, 2021). Sawmills processed timber into lumber with circular saw, mighty mite, kernali brand, head rigs and French manufactured CD4, CD5, CD6 horizontal band saws, brenta vertical, antiglo machine, jevo machine, primultini vertical and forestor, with few using the Numeric Controlled (NC) devices (Ogunwusi, 2012). They are mostly focus in cities, usually regarded as the heart of activity with manufacturing capacity of 500m^3 annual outputs per mill (Olufemi *et al*. 2012). Sawmills are the basic suppliers of lumber to the furniture and construction industries known for huge utilization of lumber (Larinde and Erakhrumen, 2021). This is credited to population expansion and mobility, access to credit facilities, increased literacy, number of families and wages stimulating the purchase of different furniture items (Sakagami and Sakaguchi, 2022).

Logs, the basic raw material for lumber production is obtained mainly from natural forest in Nigeria (Raw Materials Research and Development Council (RMRDC), 2009). During legal logging operation where merchantable trees are marked by the State Forestry Department for felling, non-merchantable adjoining trees are destroyed in the process of felling and creation of paths for transporting the logs (Danilovic *et al*., 2015). The low lumber recovery of logs in sawmills where the waste generated is more than half of the log volume (Ohwo *et al*., 2020) also contributes to deforestation as more logs are extracted from the forest to meet demands for sawn-wood (Ohwo and Ogoha, 2017). Chainsaw milling activities is another form of converting wood in Nigeria where logs are converted into boards after felling at the stump site before evacuation from the forest using the chainsaw machine, also contribute significantly to deforestation. This process is often practiced in Nigeria rainforest zone during illegal logging activities (Adeleye, 2018).

Hence, this study surveyed various tree species processed in sawmills within South-South zone of Nigeria for effective management plan.

METHODOLOGY

Study area

This study was done in South-South zone of Nigeria. The area lies approximately between Latitude 4°25'N and 7°40'N, and Longitudes 5°41'E and 9°70'E. The zone occupies 10.3% (94,924 km^2) of Nigeria land mass. The region is made up of six constituent states (Akwa Ibom, Bayelsa, Cross River, Delta, Edo and Rivers States).

Sampling procedure

Three states were randomly selected from the six constituent states of South-South zone of Nigeria. The selected states were Akwa Ibom, Bayelsa and Delta States. Forty two, thirty three and forty eight sawmills exist in Akwa Ibom, Bayelsa, and Delta States respectively. Sampling intensity of 47.6%, 60.6% and 41.7% was used in randomly selecting 20 sawmills each from Akwa Ibom, Bayelsa and Delta States respectively.

Data collection and analysis

Primary data on sawmills socio-economic profile, timber species processed and their uses were obtained through structured questionnaire. Data were analysed using descriptive statistics. Wood density, an important factor for wood utilization was obtained using model (1)

Wood density = Mass (kg)/ Volume (m^3) (1)

RESULTS AND DISCUSSION

Demographic Characteristics of Sawmill Owners/managers

The demographic profile of sawmills owners/managers (Table 1) shows that the mean age of sawmill operators was 43±0.98 years. Respondents' gender characteristic shows that 93.3% of the work-force were male; 96.7% were married and possessed the ability to read and write with 60.0% possessing secondary. The high involvement of male between the ages of 31-50 years implies that timber processing activities are energy demanding. These activities of loading, off-loading, movement of logs to sawing machines and arranging of lumber in sheds requires young, active, well-built male with good physical

fitness. Mong'are *et al*. (2017) and Ohwo and Ogoha (2017) stated that sawmilling and other energy demanding and tough jobs are dominated by male. The dominance of middle age male in timber processing shows that they have the energy and strength to handle stress. This is in line with the findings of Mong'are *et al.,* (2017) and Ohwo *et al*. (2020) that the middle age people tend to dominate sawmill business. The large engagement of married and educated people in timber processing is a reflection that sawmilling provides income and employment as reported by Ohwo (2016). Education altitude may also help the saw millers in proper management and records of production and business activities.

Respondents' number of years of sawmilling reveals that 30.0%, 23.3%, and 21.7% have been in sawmilling for 11-15, 6-10 and 16-20 years respectively. Respondents who have spent over 21-30 years in sawmilling were about 21.7% while starters were negligible with just 3.3%. The low level of starters in sawmilling corroborates Larinde and Erakhrumen (2021) that there exist prolific decline of Nigeria local sawmills. These sawmills were managed by owners who constitute 66.7% of the respondents'. The result for sawmill capital base shows that 70.0% of the respondents' capital bases were between ₦5,000,000 - ₦9,999,999 while 26.0% had capital bases of ₦10,000,000 - ₦14,999,999 investment. Olorunnisola (2023) affirm the dominance of sole sawmill owners. He further emphasized need for collaborative engagement because of the capital intensive nature of sawmilling especially in equipment purchase

Table 1: Demographic characteristics of sawmill owners/managers in South-South zone of Nigeria

Variables	Group	Frequency	Percentage	Mean
Age of operator	31-40	23	38.3	
	41-50	29	48.3	
	51-60	08	13.4	43±0.98
	Total	60	100	
Gender	Male	56	93.3	
	Female	4	6.7	
	Total	60	100	
Marital status	Single	02	3.3	
	Married	58	96.7	
	Widowed	00	0.0	
	Total	60	100	
Level of education	No formal education	00	0.0	
	Primary	10	16.7	
	Secondary	36	60.0	
	Tertiary	14	23.3	
	Total	60	100	
Years of experience	1-5	02	3.3	
	6-10	14	23.3	
	11-15	18	30.0	
	16-20	13	21.7	
	21-25	06	10.0	
	26-30	07	11.7	15.3±0.89
	Total	60	100	
Sawmill management type	Owner managed	40	66.7	
	Leased	20	33.3	
	Total	60	100	
Capital base (Value as at 2022)	₦1000000 - ₦4999999	03	2.0	
	₦5000000 - ₦9999999	38	70.0	
	₦10000000 - ₦14999999	16	26.0	
	₦15000000 - ₦19999999	03	2.0	9,190,000±505471.2
	Total	60	100	

Source: Field survey 2022

Tree Species Processed in Sawmills in South-South zone of Nigeria

The tree species sawn in sawmills in Akwa Ibom, Bayelsa and Delta State is presented in Tables 2, 3 and 4 respectively. In Akwa Ibom State, 33 species were available for sawing (Tables 2) with *Daniella olivera* (100.0%) and *Pterocarpus osun* (95.0%) the most sawn while *Ricinodendron heudolotii* the least sawn (35.0%). In Bayelsa State, 37 species were sawn in sawmills (Tables 3). The most sawn timber species were *Daniella olivera* (100.0%) and *Pterocarpus osun* (100.0%) with *Chrysophyllum albidum* (50.0%) the least sawn. In Delta State, 25 species were processed in sawmills with *Ceiba pentandra* (100.0%), *Khaya species* (90.0%) and *Daniella olivera* (90.0%) the most sawn, while *Lophira alata* (45.0%) was the least sawn (Table 4). A total of 49 tree species belonging to 25 families were sawn in the zone with *Daniella olivera* the most (96.7%) and *Ricinodendron heudolotii* the least (11.7%) processed (Tables 5). The most commonly sawn tree species belong to the family, *Caesalpiniaceae* and *Papilionaceae* followed by *Combretaceae, Miniosacaea* and *Rubiaceae.*

The identified tree species sawn in sawmills in Southern Nigeria were mostly rainforest species and indigenous to the zone except for species of *Gmelina arborea* which was the only exotic tree species sawn. These species are dominant in the freshwater swamp forests area of Nigeria as reported by Ofoegbu *et al.* (2014) and Ohwo and Agbogidi (2015). These authors identified species of *Afzelia africana, Pterocarpus soyauxii, Khaya ivorensis, Lophira alata, Cylicodiscus gabunensis, Brachystegia eurycoma, Daniella ogea, Entandrophragma cyclindricum, Alstonia boonei, Cistanthera papaverifera, Amphimax pterocarpoides, Halea ciliata, Terminalia ivorensis, Triplochiton scleroxylon* and *Sterculia oblonga* as tree species present in rainforest and sawn in South-South zone of Nigeria.

Forty eight (48) out of the 49 species identified constitute 8.0% of the total known Nigerian forest trees species while the 49 species identified makes up 81.7% of the marketable wood species in Nigeria. This result corroborates the findings of Ohwo and Agbogidi (2015) who identified 43 traded wood species in Delta State, constituting 72.0% marketable wood species and 7.0% of the total known Nigerian forest trees species in Nigeria. The most processed timber species are faced with overexploitation because of high wood quality.

The high dependence on logs by sawmills from natural forest within South-South zone of Nigeria accounts for the high deforestation rate observed in the natural forest and reserves. This agrees with the reports of Ohwo *et al*., (2020). Furthermore, the poor involvement of saw millers in plantation forestry implies that revenue generated from the sawmilling business is diverted to other sectors, thus negatively affecting development of forestry sector. This is a greatest challenge confronting the sector as reported by Bhandari *et al*., (2019). Thus, effective management via afforestation and reforestation is imminent to ensure their continuity. Olorunnisola (2023) proposed establishment of large timber plantations and usage of substitutes or lesser known wood species for continous timber supply to users.

These species were processed for various uses. The suitability of timber species for any use depends not only on their density (Table 5), but on grains, texture, workability, shrinkage properties, strength and finishing properties. Their uses ranged from construction to furniture work, canoe building, decking, bed, doors, billets, railway slippers amongst others as in Awka Ibom (Tables 2), Bayelsa (Tables 3) and Delta States (Tables 4). The diverse use of these wood species corroborates reports of Adeniyi *et al*. (2013), Arowosoge (2015) and Olorunnisola (2023). These authors stated that sawn-wood is utilized for building, construction, making roofs and furnitures. Arowosoge (2015) identified *Khaya ivorensis, Milicia excelsa, Nesogordonia papaverifera and Nauclea diderrichii* as some preferred roofing wood species in South-west Nigeria. Adeniyi *et al.* (2013) identified *Ceiba pentandra, Bombax bounopozense and Diospyros mespiliformis, Mansonia altissima, Lophira alata* species as suitable for furniture and heavy construction work, respectively.

Table 2: Processed timber species and uses in Akwa Ibom State

S/N	Species	Trade name	Frequency (N=20)	Percentage	Rank	Uses
1	*Amphimas pterocarpoides*	Awang	18	90	3	Roofing
2	*Baillonella toxisperma*	Minnisop	14	70	6	Furniture
3	*Baphia nitida*	Baphia	13	65	7	Roofing
4	*Brachystegia eurycoma*	Achi	10	50	10	Doors/door frame
5	*Bombax buonopozense*	Cotton	14	70	6	Decking and covet
6	*Ceiba pentandra*	Araba	19	95	2	Furniture
7	*Diospyros spp*	Ebony	16	80	5	Cubic used as billet for export
8	*Khaya species*	Mahogany	17	85	4	Furniture
9	*Lophira alata*	Ekki/iron wood	10	50	10	Cubic for rail line
10	*Lovoa trichiliodes*	Ceda	11	55	9	Doors, beds
11	*Melicia excels*	Iroko	18	90	3	Doors, beds
12	*Mitragyna stipulosa*	Owen	10	50	10	Furniture
13	*Piptadeniastrum Africana*	Small leaves	16	80	5	Roofing
14	*Poga oleosa*	Poga	13	65	7	Doors, interior decoration
15	*Pterocarpus osun*	Red camwood	19	95	2	Roofing, canoe building
16	*Pterocarpus soyauxii*	White camwood	9	45	11	Roofing
17	*Pycnanthus angolensis*	Akuanuiri	17	85	4	Decking bridges
18	*Standtia stipitata*	Achara	16	80	5	Door and bed
19	*Terminalia ivorensis*	White afara	17	85	4	Furniture
20	*Terminalia superba*	Black afara	19	95	2	Furniture
21	*Cordia millenii*	Omon	13	65	7	Roofing
22	*Gmelina arborea*	Gmelina	14	70	6	Furniture and construction
23	*Nuclea diderrichii*	Opepe	16	80	5	Roofing and furniture
24	*Triplochiton scleroxylon*	Obeche	17	85	4	Facing board
25	*Alstonia boonei*	Egbu wood	9	45	11	Tie rod, casket and furniture
26	*Anogeissus leiocarpus*	Ataraban	16	80	5	Roofing
27	*Daniella olivera*	Agba	20	100.0	1	Roofing, furniture
28	*Fagara macrophylla*	Uko	12	60	8	Roofing
29	*Mansonia altissima*	Mansonia	9	45	11	Ceiling, interior decoration
30	*Micimerlinia brazzavililesis*	Zebra wood	17	85	4	Furniture, bed, roofing
31	*Pericopsis elata*	Ebelebe	10	50	10	Furniture
32	*Afzelia Africana*	Kerosene wood	9	45	11	Roofing
33	*Ricinodendron heudolotii*	Ukin	7	35	12	Fishing boat

Source: Field survey, 2022

Table 3: Processed timber species in Bayelsa State

S/N	Species	Trade name	Frequency (N=20)	Percentage	Rank	Uses
1	*Afzelia Africana*	Apa	12	60	8	Furniture
2	*Albizia ferruginea*	Ayinre	15	75	5	Furniture
3	*Brachystegia eurycoma*	Okwen/Eku	13	65	7	Doors, frames
4	*Daniella olivera*	Owaje	20	100	1	Roofing
5	*Khaya species*	Mahogany	17	85	3	Roofing, bed and furniture
6	*Lophira alata*	Ekki	12	60	8	Cubic for rail line
7	*Milicia excels*	Iroko	13	65	7	Door, furniture
8	*Nauclea diderrichii*	Opepe	15	75	5	Roofing, bed
9	*Terminalia ivorensis*	Black afara	17	85	3	Roofing, furniture
10	*Treculia Africana*	Okwa/ize	17	85	3	Furniture
11	*Vitellaria paradoxa*	Shear butter	16	80	4	Furniture
12	*Alstonia boonei*	Alstonia	14	70	6	Casket, noggin
13	*Albizia lebbeck*	Albizia	11	55	9	Furniture
14	*Antiaris africana (toxicaria)*	Ijebu iroko	18	90	2	Door, bed
15	*Baphia nitida*	Baphia	11	55	9	Roofing
16	*Bombax buonopozense*	Bombax	17	85	3	Decking and covet
17	*Ceiba pentandra*	Araba	18	90	2	Furniture
18	*Chrysophyllum albidum*	Otieme	10	50	10	Roofing
19	*Cordia millenii*	Omo	18	90	2	Roofing
20	*Diospyros species*	Ebony	18	90	2	Roofing, furniture
21	*Gmelina arborea*	Gmelina	14	70	6	Furniture, construction
22	*Nauclea dedirrichii*	Opepe	15	75	5	Roofing, bed
23	*Nesogordonia papaverifera*	Danta	13	65	7	Roofing, bed
24	*Ostryoderris species*	Oriri	14	70	6	Roofing, bed
25	*Pycnanthus angolensis*	Akomu	16	80	4	Roofing, bed
26	*Sterculia oblonga*	Aye danta	15	75	5	Roofing, bed
27	*Terminalia superba*	White afara	18	90	2	Roofing, furniture
28	*Anopyxis klaineana*	Eto	13	65	7	Roofing
29	*Blighia sapida*	Ukpe	12	60	8	Door, bed, roofing
30	*Corynanthe pachyceras*	Nikiba	17	85	3	Roofing
31	*Hylodendron gabunense*	Akesi	13	65	7	Furniture
32	*Lovoa trichiloids*	Ceda	14	70	6	Furniture
33	*Metrosideros polymorpha*	Ohia	14	70	6	Roofing
34	*Triplochyton schleroxylon*	Obeche	15	75	5	Furniture
35	*Piptadeniastrum Africana*	Ekimi	10	50	10	Furniture
36	*Pterocarpus osun*	Red camwood	20	100	1	Canoe building
37	*Poga oleosa*	Poga	11	55	9	Roofing
38	*Uapacca staudtii*	Upaka	14	70	6	Furniture

Source: Field survey, 2022

Table 4: Processed timber species in Delta State

S/N	Species	Trade name	Frequency (N=20)	Percentage	Rank	Uses
1	*Anopyxis klaineana*	Ake	13	65	7	Furniture, roofing
2	*Amphimas pterocarpoides*	Awo	15	75	5	Roofing
3	*Brachystegia eurycoma*	Okwen	14	70	6	Door, door frame
4	*Bombax buonopozense*	Ido undu	14	70	6	Decking and covet
5	*Chrysophyllum albidum*	Udala	11	55	8	Furniture
6	*Ceiba pentandra*	Araba	20	100	1	Furniture
7	*Cordia millenii*	Kieboeke	16	80	4	Roofing
8	*Gmelina arborea*	Gmelina	14	70	6	Furniture
9	*Lovoa trichiloids*	Walnut	11	55	8	Roofing/furniture
10	*Poga oleosa*	Imono	11	55	8	Door, interior decoration
11	*Pterocarpus osun*	Isele	18	90	2	Roofing, canoe building
12	*Blighia sapida*	Ilipa	13	65	7	Furniture
13	*Lophira alata*	Kumu	9	45	10	Rail line cubic
14	*Nauclea dedirrichii*	Owoso	16	80	4	Roofing, furniture
15	*Nesogordonia papaverifera*	Danta	15	75	5	Roofing, furniture
16	*Terminalia superba*	Gbarada	18	90	2	Furniture
17	*Terminalia ivorensis*	Ubiri	17	85	3	Furniture
18	*Afzelia Africana*	Akpalata	14	70	6	Roofing
19	*Daniella olivera*	Orubwa	18	90	2	Roofing/furniture
20	*Khaya species*	Mahogany	18	90	2	Furniture
21	*Milicia excels*	Iroko	15	75	5	Furniture
22	*Ostryoderris species*	Oriri	16	80	4	Roofing
23	*Sterculia oblonga*	Ebenebe	14	70	6	Door, bed
24	*Uapacca staudtii*	Onye/Lagoswood	17	85	3	Roofing
25	*Vitellaria paradoxa*	Shear butter	10	50	9	Roofing, furniture

Source: Field survey, 2022

Table 5: List of tree families and species processed in Sawmills in South-South zone of Nigeria

S/N	Family	Species	Frequency (N=60)	Percentage	Rank	Density (Kg/m^3)
1.	*Anisophylleaceae*	*Poga oleosa*	35	58.3	12	432.50
2.	*Apocynaceae*	*Alstonia boonei*	23	38.3	23	400.50
3.	*Bombacaceae*	*Bombax buonopozense*	45	75.0	8	480.56
4.	*Boraginaceae*	*Cordia millenii*	47	78.3	6	400.46
5.	*Caesalpiniaceae*	*Brachystegia eurycoma*	37	61.7	10	624.72
		Amphimas pterocarpoides	33	55.0	14	785.00
		Daniella olivera	58	96.7	1	496.57
		Afzelia Africana	35	58.3	12	816.94
6.	*Combretaceae*	*Terminalia ivorensis*	51	85.0	5	512.59
		Terminalia superba	55	91.6	3	544.63
		Anogeissus leiocarpus	16	26.7	27	880.00
7.	*Ebenaceae*	*Diospyros species*	34	56.7	13	848.98
8.	*Euphorbiaceae*	*Uapacca staudtii*	31	51.7	16	736.85
		Ricinodendron heudolotii	7	11.7	35	450.00
9.	*Fabaceae*	*Hylodendron gabunense*	13	21.7	30	900.00
		Pericopsis elata	10	16.7	33	688.80
10.	*Leguminosae*	*Micimerlinia brazzavililesis*	17	28.3	26	848.98
11.	*Malvaceae*	*Nesogordonia papaverifera*	28	46.7	19	800.93
		Ceiba pentandra	57	95.0	2	320.37
12.	*Meliaceae*	*Khaya species*	52	86.7	4	736.85
		Lovoa trichiloides	36	60.0	11	544.63
13.	*Mimosaceae*	*Piptadeniastrum africana*	26	43.3	20	688.80
		Albizia lebbeck	11	18.3	32	640.74
		Albizia ferruginea	15	25.0	28	640.74
14.	*Moraceae*	*Treculia Africana*	17	28.3	26	615.00
		Antiaris Africana	18	30.0	25	432.50
		Milicia excelsa	46	76.7	7	688.80
15.	*Myristicaceae*	*Pycnanthus angolensis*	33	55.0	14	496.57
		Standtia stipitata	16	26.7	27	913.05
16.	*Myrtaceae*	*Metrosideros polymorpha*	14	23.3	29	915.00
17.	*Ochnaceae*	*Lophira alata*	31	51.7	16	1121.30
18.	*Papilionaceae*	*Baphia nitida*	24	40.0	22	1280.00
		Pterocarpus osun	57	95.0	2	656.76
		Pterocarpus soyauxii	9	15.0	34	752.87
		Ostryoderris species	30	50.0	17	750.62
19.	*Rhizophoraceae*	*Anopyxis klaineana*	26	43.3	20	448.52
20.	*Rubiaceae*	*Mitragyna stipulosa*	10	16.7	33	560.00
		Nuclea diderrichii	47	78.3	5	752.87
		Corynanthe pachyceras	17	28.3	26	710.35
21	*Rutaceae*	*Fagara macrophylla*	12	20.0	31	848.98
22.	*Sapindaceae*	*Blighia sapida*	25	41.7	21	910.16
23.	*Sapotaceae*	*Baillonella taxisperma*	14	23.3	29	881.02
		Chrysophyllum albidum	21	35.0	24	654.76
		Vitellaria paradoxa	26	43.3	20	720.00
24.	*Sterculiaceae*	*Mansonia altissima*	9	15.0	34	720.00
		Triplochiton scleroxylon	32	53.3	15	385.00
		Sterculia oblonga	29	48.3	18	768.89
25.	*Verbenaceae*	*Gmelina arborea*	42	70.0	9	560.00

Source: Field survey, 2022

CONCLUSION AND RECOMMENDATION

Numerous timber species were harvested and processed in South-South zone of Nigeria. The frequency of availability of certain species in sawmills connotes their intense exploitation. For continuity of forest estate, timber processing ventures and constant supply of lumber to end users, it is imperative to carry out aggressive afforestation measures and encourage private plantation establishment of the most sawn timber species to prevent their extinction.

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Authors' Contribution

O.O.A. managed data collection, interpretation of data, writing of manuscript, material support, and review of manuscripts and wrote the first draft of the manuscript. O.O.A. managed the literature searches and developed methodology and data analysis. O.O.A have read and approved the final manuscript.

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