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Factors Influencing the Choice of Wood Species for Furniture Production in Ado Ekiti Metropolis, Ekiti State, Nigeria

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ABSTRACT

Furniture making is a major source of employment in wood-based industries, which can be started on either a small or large scale, and is capable of alleviating poverty among youths. This study was conducted to evaluate the factors influencing the choice of timber for furniture production in Ado Ekiti metropolis, Ekiti State, Nigeria. A purposive sampling technique was employed to select furniture workshops, while snowball sampling was used to select respondents. Data were collected using 40 copies of a semi-structured questionnaire administered to furniture makers. The findings revealed that Gmelina arborea and Tectona grandis are the most commonly used timber species for furniture making due to their accessibility and product durability. The result shows that the furniture industries have a minimum of between 1-5 workers, and the major source of timber used is derived from the sawmill. The result revealed a decline in timber quality and quantity due to premature harvesting for economic reasons. Scarcity of the most preferred tree species and the high cost of timber are observed as the major challenges faced by furniture makers in the study area. Consequently, based on the findings of this study, it was recommended that the government should enforce stricter forestry regulations on timber harvesting to prevent illegal logging, mandating minimum girth length for key species, and furniture makers should be educated on wood seasoning to prolong the longevity of the furniture produced.

Keywords: Ado Ekiti, Furniture Production, Nigeria, Species, Wood

1. Introduction

The forest industry in Nigeria principally consists of sawmills, furniture, wood-based panels, and splints. However, the performance of each segment within the industry varies (Ogunwusi, 2012). Wooden furniture industries make a substantial contribution to development in tropical countries, producing important economic benefits and playing significant roles in promoting economic growth (ITC/ITTO, 2018). Furniture is an inevitable part of human existence. It is used for the beautification of both private and public spaces while also providing significant opportunities for income generation, employment, and the development of craftsmanship. The furniture includes doors, tables, chairs, decorations, cabinets and shelves, cupboards, beds, windows, roofing, and other items (Adedokun *et al*., 2018) made from sawn wood. In Nigeria, sawn wood is used for various purposes, including furniture across the country, and its prices are a fundamental prerequisite for the socio-economic development of the country (FAO, 2019). Among the semi-processed and processed wood categories, sawn wood has the highest production and demand, and it is the most widely distributed in Nigeria for the construction of buildings and furniture. Uzowulu (1990), in the study of the effect of labour productivity in the furniture industry in Ibadan, revealed that the furniture industry is a major contributor to the national economy, and only a few other industrial sectors contribute more in terms of generation of local funds as well as in employment of labour. The wood-based industries, therefore, have been identified as a veritable tool in poverty alleviation because of their potency in revenue generation, job creation, investment attraction, and creation of markets for local products (Olorunnisola, 2020).

Wood consumption in Nigeria is estimated at over 200,000 m^3 per annum (Arowosoge *et al*., 2011, while the utilization and further processing of the wood provides employment to numerous people and thus contributes to the local and national economy. In furniture making, certain wood species are prioritized for utilization over others. Arowosoge *et al.,* (2010) categorized 39 wood species and listed that 15 of these 39 wood species were commonly used for furniture making, while the other 24 species were categorized as lesser-used species. The choice of wood species utilized for furniture making differs due to the different features and characteristics of the wood. These characteristics are consistent with the species of tree, such as the strength, hardness, durability, and appearance, which vary between species (Revenshorst, 2013), the utilization potential, ease of machine and workability, cost (Busby and Binkley, 2018), and hardness, among others (Ogunjobi *et al*., 2019).

The high demand for wood species due to population growth by the furniture industry, and the rising demand for wood and wood products, coupled with the escalating prices of wood over the years, has led to a decline of popular species that are used for furniture making. More recently, Teischinger (2017) designated the usage of hardwood lumber in furniture making due to its longevity and durability over softwood. However, the furniture industry is faced with a number of challenges that are affecting the output and also threatening the profitability and sustainability (Grzegorzewzka, 2017) of the furniture

industry. Literature has underscored unprecedented illegal logging and unsustainable timber harvesting in Nigeria's forests. These are a major threat to the sustainable supply of raw materials and hence have an effect on the competitive performance amongst firms in the furniture industry. In addition, the enterprise mostly uses simple technologies with low technical know-how and low capital input, with crude hand tools and equipment, resulting in poor-quality products. Moreover, Aroso *et al*., (2016) observed that among the wood-based products, the furniture value-added part is the most ranked. While the domestic furniture market is growing rapidly, the sector is dominated by small-scale operators of about 3-5 men (ITTO, 2013). This research was aimed at (i) identifying the various types of wood used for furniture production in the study area, and (ii) examining the factors influencing the choice of wood used for furniture in Ekiti State, Nigeria, for competitive performance (Aribisala 2013).

2. METHODOLOGY

2.1 Study area

The study was conducted in Ado-Ekiti metropolis. This area comprises Ado North, North-east, North-west, South-east, and South-west local governments in Ekiti State, Nigeria. Ado Ekiti is located between Latitudes 7º 20' 03" and 7º 26' 12" N, Longitudes 3º 51' 65" and 3º 56' 48" E. Ado-Ekiti is a metropolitan city having varying scales of Furniture/carpentry enterprises constructing different types of wood products ranging from household items to building construction such as trusses. Ado-Ekiti, the headquarters of Ekiti State, is the capital city of Ekiti State, harbouring many fringes of natural and artificial forests. The City enjoys the supply of raw timber from neighbouring towns within and outside the State. Within the City, sawmilling has always been the main source of sawn wood delivery for users. Sawn woods are mainly produced from timber species sourced from the natural forests within the region. Sawn woods are utilised for a variety of purposes, and its utilization forms a major part of the many subsistence activities at the informal economic level in the city.

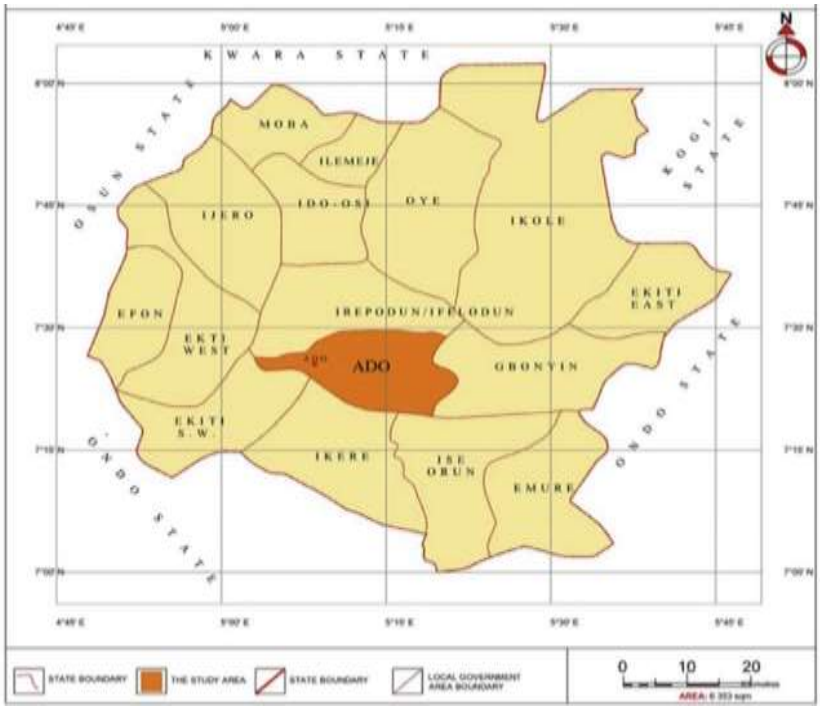

Figure 1: Map of Ekiti State showing the Study Area

2.2 Research Design

This study adopted a cross-sectional survey design. This is because the design allows for sampling of a few respondents to represent the entire population of furniture makers in Ado Metropolis.

2.3 Sampling Technique and Procedure

Multi-stage sampling techniques were used for this study. The first step involved the delineation of Ado metropolis into four (4) zones, which include the northern zone, the southern zone, the eastern zone, and the western zone. The second step is the purposive selection of furniture workshops in each zone, due to the abundance of furniture industries in the area. Finally, the respondents were also selected using a snowball sampling technique.

Table 1. Major areas in each zone where the research was conducted.

Northern Zone	Eastern Zone	Western zone	Southern Zone
Oke Ila	Oke Ureje	Basiri	Odo Ado
Nova Road	Poly Road	Fajuyi Area	Ajilosun
Adebayo	Elemi Area	Ilawe Road	Omisanjana
Tinuola Area	Afao Road	Fajuyi Housing estate	Moferere

2.4 Data Collection Techniques

Data was collected using a semi-structured questionnaire and personal observation. The semi-structured questionnaire was designed and administered to furniture makers by visiting their workshops or workplaces to obtain all necessary information used for this project. Ten (10) furniture makers were selected from each zone, making all samples a total of 40.

2.5 Data Analysis

The data collected were collated and analysed using SPSS version 27, and the results were presented in descriptive statistical form, such as frequency tables and charts.

3. RESULTS AND DISCUSSION

3.1 RESULT

3.2 Socio-economic characteristics of the respondents

Table 2 revealed the Socio-economic characteristics of the respondents based on age, gender, household size, and ethnic background. The result showed that 45.0% of the furniture producers are in the age range of 41-50 years, 22.5% of the furniture makers are within the age range of 31-40 years, 17.5% are between 21-30 years, while 15.0% are above the age of 50 years. The largest proportion (95.0%) of the furniture producers are male, while 5.0% are female.

The Majority (52.5%) of the furniture producers have a household size of 4-6 individuals, 27.5% have a household size of about 7 or above individuals, and 20% have a household size of 1-3 individuals. The result of the ethnic background revealed that 100% of the furniture producers are Yoruba. The result also showed that the majority (77.5%) had secondary school education, 20.0% had tertiary education, and 2.5% had primary education.

Table 2: demographic characteristics of the respondents

Variables	Categories	Frequency	Percentage (%)
Age	21-30	7	17.5
	31-40	9	22.5
	41-50	18	45.0
	50>	6	15.0
	Total	40	100
Gender	Male	38	95.0
	Female	2	5.0
	Total	40	100
Household size	1-3	8	20.0
	4-6	21	52.5
	7 and above	11	27.5
	Total	40	100

Ethnic background	Yoruba	40	100
	Igbo	0	0
	Hausa	0	0
	Total	40	100
Educational background	Primary	1	2.5
	Secondary	31	77.5
	Tertiary	8	20.0
	Total	40	100

Source: Field survey, 2024

3.3 Furniture making and workers' size

The result on the size of workers in the furniture industry in Figure 1 shows that 55.0% of furniture industries in the study area had between 1-5 workers, 25.0% of furniture industries had between 1-5 workers, and 20.0% had above 10 workers.

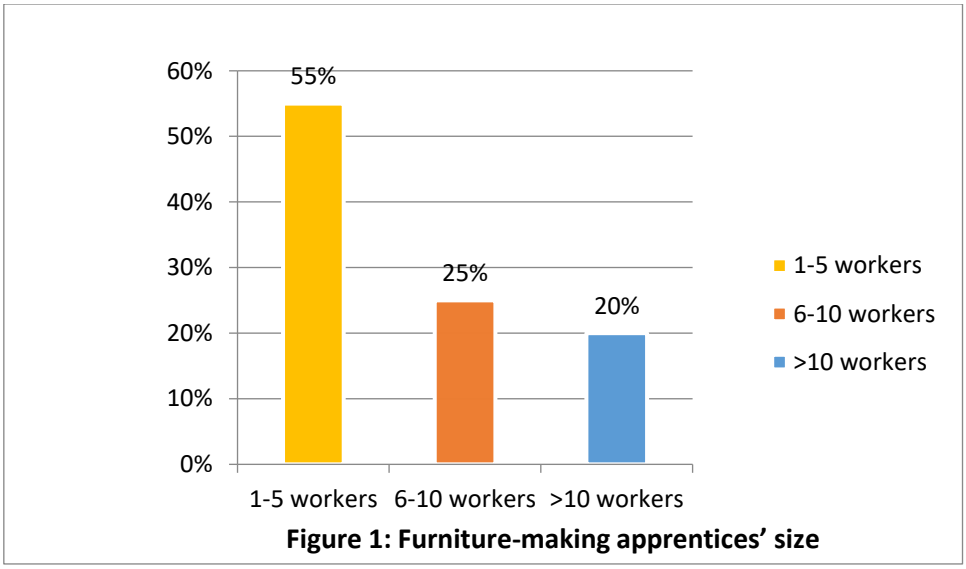

Figure 1: Furniture-making apprentices' size

Source: Field survey, 2024

3.4 Types of tree species used for furniture production

The result in Table 3 revealed the types of tree species commonly used for furniture production in the study area based on the respondents' experiences. The result showed that 24.4% of the respondents were using *Gmelina arborea* for furniture making, 21.2% used *Tectona grandis*, 16.9% used *Guarea thompsonii*, 18.1% of the respondents depended on *Khaya senegalensis*, 3.1% used *Terminalia ivorensis*, 10.0% of the respondents reported *Milicia excelsa*, 4.4% mentioned *Mansonia altissima*, while 1.9% of the respondents mentioned *Triplochiton scleroxylon.*

Table 3: Tree species commonly used in furniture production

S/N	Common Names	Local Names (Yoruba)	Scientific Names	Percentage %
1	Teak	Igi Teak	*Tectona grandis*	21.2
2	Beechwood	Igi Melaina	*Gmelina arborea*	24.4
3	Black guarea/Dark bosse	Obobo	*Guarea thompsonii*	16.9
4	African Mahogany	Oganwo	*Khaya senegalensis*	18.1

5	Black Afara	Afara	*Terminalia ivorensis*	3.1
6	African Teak	Iroko	*Milicia excelsa*	10
7	Obeche	Arere	*Triplochiton scleroxylon*	4.4
8	Mansonia	Ofun, Afon	*Mansonia altissima*	1.9

Source: Field survey, 2024

3.4 Sources of timber for furniture production

The sources of the timbers used for furniture production, as revealed in Table 4, indicated that 78.4% of the woods are derived from saw mills, 9.8% of the woods are from the wild, and 5.9% of the woods are derived from farm areas/plantations and forest reserves, respectively.

Table 4: Sources of wood used in furniture production

Timber sources	**Frequency**	**Percentage (%)**
Forest Reserves	3	5.9
Farm/Plantation	3	5.9
Saw millers	40	78.4
Wild	5	9.8
Total	**51**	**100**

Source: Field survey, 2024

3.5 Distance of wood sources to the furniture workshops

Table 5 revealed the distance covered by furniture makers from the wood source to the furniture workshops in the study area. The majority (37.5%) of the furniture makers transport woods from a source covering a distance of 21km-50km, 25% of furniture makers got their supply from a source covering between 11-20km, and over 50km respectively, while 12.5% of the furniture makers got their wood supply from a source less than 10km away from their workshops.

Table 5: Distance of wood source to the furniture workshops

Categories	**Frequency**	**Percentage (%)**
<10km	5	12.5
10km-19km	10	25.0
20-29km	15	37.5
>30km	10	25.0
Total	**40**	**100**

Source: Field survey, 2024

3.6 Reasons for the choice of timber used for furniture production

Table 6 revealed the reason for the choice of particular timber used in furniture making by the makers. The result showed that 41.2% of the makers' choice was based on the availability of timbers, 41.2% was based on the quality and durability of woods sawn from the timbers, 11.7% based their choice on the ease of working with the wood, while 5.9% of the respondents were based on the cost of acquiring the wood.

Table 6: Reasons for the choice of timber used

Reasons	Frequency	Percentage (%)
Availability	28	41.2
Cost	4	5.9
Quality/Durability	28	41.2
Ease to work with	8	11.7
Total	**68**	**100**

Source: Field survey, 2024

4.7 Respondents' awareness of change in wood quality and quantity

The result in Figure 2 shows that the majority of the respondents (75.0%) were aware of changes in both quality and quantity of wood supplied in recent times when compared with what was obtainable over ten years ago, while 25.0% were unaware of the change in both quality and quantity.

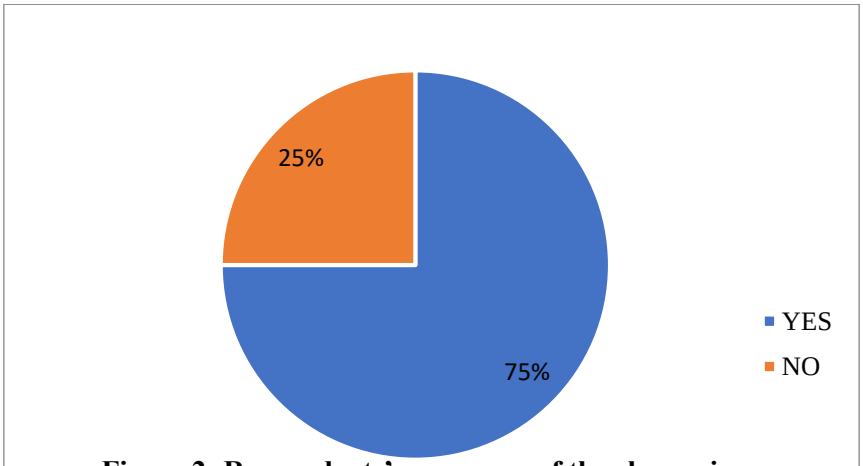

Figure 2: Respondents' awareness of the change in the quantity of wood supplied for furniture production

Source: Field survey, 2024

3.8 Discussion

The furniture industry is one of the major sources of employment capable of ameliorating poverty among youths in Ekiti State. The industry, according to the respondents, can be initiated either on a small scale, which may later be expanded, or on a large scale, depending on the availability of funds. In Ado Ekiti, the furniture industry is a fast-growing venture producing varieties of items used for different purposes, both in homes and offices. The majority (55.0%) of the furniture industries in Ado Ekiti had between 1-5 workers who were mainly male. The dominance of male participants (95.0%) in the furniture industry is associated to the fact that the industry is energy-demanding, which can only be supplied by strong and agile youth. The result aligns with previous research by Ojo *et al.*, (2020), who reported that furniture production is often male-dominated due to the physical nature of the work and societal norms. The high proportion of producers aged between 41-50 years (45%) observed suggests that experience plays a significant role in furniture production and sustainability. Furthermore, the predominance of respondents with secondary education reflects the accessibility of furniture production as a trade requiring vocational education rather than advanced academic qualifications. This assertion agrees with the findings of Adekunle *et al.*, (2019), who noted that tertiary education is not always necessary for skilled manual trades.

Eight tree species that are suitable for furniture making were identified. These tree species are derived from both far and near the furniture workshops. The major supply of wood utilized is purchased from the sawmill, while those from other sources are from plank sellers or products from illegal logging. The most preferred planks used in furniture making are derived from Gmelina and Teak trees. The relatively high preference for *Gmelina arborea* (24.4%) and *Tectona grandis* (21.2%) signifies the readily availability of these tree species, the durability of products produced from them, the workability, and their fast rate of development. Similarly, the result aligns with the findings by Abarca-Alvarado *et al.*, (2023), indicating that these two tree species are well-suitable for furniture making due to their workability and resistance to pests. The relatively low usage of species such as *Triplochiton scleroxylon* and *Mansonia altissima* could be associated with scarcity, cost of acquisition, or low growth rate and suitability for high-demand furniture products.

The importance of both availability, quality, and durability (41.2%) suggests that furniture makers prioritize timber that is both accessible and meets functional standards. This balance between practical and quality considerations aligns with the findings of Eboh and Umeh (2018), who observed that timber selection often involves trade-offs between cost, accessibility, and performance.

This study also showed that furniture made from Gmelina, Teak, and other hardwoods are durable. The durability (52.5%) of furniture produced from them lasting over 15 years, as reported by the respondents, underlines the importance of selecting high-quality timber species. This finding corroborates the work of Boampong *et al.,* (2015), who emphasized that the durability of furniture depends on proper timber selection and processing techniques.

Furthermore, a level of awareness (75.0%) of change in the quantity and quality of timber extracted from the forest and converted to planks for furniture making was observed, while a minority of the respondents were unaware of any significant change in timber quantity and quality. It was reported that timber or log sizes had reduced in diameter girth over time. This reduction in log sizes in the study area could be associated with excessive logging, high rates of deforestation, and inadequate conservation practices. Moreover, the only big and large available trees are reported to be left or conserved in cacao plantations in most cases. The improved level of the respondents' awareness recorded implied that the people are very conscious of their environment. Therefore, when properly educated and orientated, they might be willing to contribute to forest regeneration and sustainability.

4. CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

This study provides valuable insight into the factors influencing wood selection in furniture production. The findings show that the furniture industry is dominated by literate, middle-aged men. The most commonly used tree species for furniture making are *Gmelina arborea* and *Tectona grandis* due to their relative abundance, availability, and durability. Other species, such as *Khaya senegalensis* and *Milicia excelsa* are also utilized, but in smaller quantities because of their scarcity, as indicated by the notable decline in timber quantity and quality harvested and sawn. Timber availability and quality are the primary determinants of these wood selections, regardless of the tree age and girth size, as they are felled prematurely. The wood from these premature timbers is less dense and more susceptible to pest infestation, leading to reduced longevity of materials produced from them.

4.2 Recommendations

Based on the findings of the study, the following recommendations are suggested;

1. The government should implement stricter regulations on timber harvesting to prevent illegal logging by mandating minimum girth length for key species.

2. Large-scale reforestation and afforestation programs should be encouraged and focused on fast-growing but durable tree species

3. Raising awareness about the environmental impact of premature tree removal and unsustainable logging practices.

4. To ensure the continued viability of furniture production, investment in infrastructure, policy reforms, and awareness campaigns should be put in place.

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