



EXTENT OF WOOD UTILIZATION BY SMALL SCALE FURNITURE MAKERS: A CASE STUDY OF ABA TIMBER MARKET, ABIA STATE

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Abstract

This study examined the extent of wood utilization by small scale furniture makers in timber market, Aba Abia State. The study involves a random selection of 35 small scale furniture makers in Aba timber market. Structured questionnaires were used to collect information on the types of timber species used in furniture production, lumber dimensions used and percentage volume of wood used in furniture making. The data obtained was analyzed using descriptive statistics and Kruskal Wallis ranked sum test. The result from data collected showed that timber species like *Milicia excelsa*, *Khaya spp* and *Terminalia ivorensis* are most commonly used while species like *Terminalia superba*, *Garcinia kola*, *Lovoa trichilioides* were fairly or rarely used. Some lumber dimensions such as 1" x 12" x 12', 1" x 6" x 12', 1" x 4" x 12', 3" x 6" x 12', 3" x 12" x 12' and 3" x 3" x 12' were used for the production of furniture in timber market Umuahia. Also, some of the species like *Khaya spp*, *Milicia excelsa*, *Terminalia ivorensis* and others were highly utilized based on percentage volume on weekly basis. It is therefore recommended that necessary actions be taken to widen species utilization to increase value and profit, without expanding the area of harvest.

Keywords: Lumber dimension, wood, furniture makers, timber species

Introduction

Wood has been used for thousands of years as a construction material, fuel, for making tools and weapons, furniture and paper, and as a feedstock for the production of purified cellulose and its derivatives, such as cellophane and cellulose acetate (Sterret, 1994). Wood has been an important construction material since humans began building shelters, houses and boats. Nearly all boats were made out of wood until the late 19th century, and wood still remain in common use today in boat construction. Elm in particular was used for this purpose as it resisted decay as long as it was kept well (Binggeli, 2013). The furniture industry is an important sector in the Nigeria economy in terms of employment and socio-economic development. This shows the importance of forestry and sustainable wood utilization through furniture construction to national development (United Nations, 2006). There are numerous problems faced by small scale furniture markers which need to be addressed, they are the problem of utilization of wood in furniture processing, inaccurate and poorly furnished product to mention but a few (Atuhe, 2005). These problems are caused due to the insufficient information on the volume of wood used during furniture making, thus carrying out this research will give an insight on the volume and types of wood

utilized in the course of furniture making by small scale wooden furniture makers and consequently lead to reduction of deforestation and hence wood waste reduction. Also this research will further investigate the type of tree species used in small scale furniture making. Such information can be used as a guide in choosing the right processing technologies and timber management practices in order to achieve efficient wood utilization.

Materials and Method

Study Area

This project was carried out at Timber Market Aba, Abia State. The market is located at Osisioma, and lies on and longitude 7°22'18"E and latitude 5°07'23"N. It is one of the major timber markets in Abia State. The total annual rainfall ranged between 1,500mm and 3,000mm (Dike and Obiajunwa, 2012). The relative humidity is usually high throughout the year, reaching a maximum during the wet season when values above ninety per cent are recorded. Temperature is averagely 26°C throughout the year.

The soil is sandy-loam and parent material is Precambrian basement complex. The soil is deep in most places and without stones. The slope is gentle and less than 4° except at the sources of streams (Dike, 2003).

Sampling Procedures

Random sampling procedures were carried out in timber market Aba, Abia State. The market has numerous small scales wooden furniture workshops of which thirty (35) were sampled. Data on demographic characteristics of respondents' working experience, education background, tree species used, lumber dimension used, the types and volume of the wood used for the construction of selected piece of furniture were collected using structured questionnaire. The tree species and Lumber dimensions were ranked based on the frequency of use for each carpentry workshops.

Statistical Analysis

Descriptive statistics method and kruskal wallis rank sum test were used to analyzed the data from questionnaire. R statistical software 3.5 (R core team) was used to perform the statistical analysis.

Results and Discussion

The demographic information on the respondents summarized in Table 1 revealed that 46.4% of the respondents in the study area were males, while 18.7% were females. The results clearly show that males dominate the Aba Furniture makers. Other classifications and their respective percentages on education and marital status of the respondents are presented in the Table 1. All respondents acquired experience in practical furniture making. 14.3% have been in the business of furniture making for 1-2years, 28.6% have put to use the practice for 3-4years while 57.1% have been active in furniture business for 5years and above.

In Table 2, Kruskal wallis rank sum test was used to analyzed the data. A non-parametric method was used because the data is ranked. From the analyzed data based on individual species used for furniture production in Aba, there was no significant difference in the individual species selection ($\chi^2 = 15.503$, $df = 10$, $P = 0.1148$). Based on grouping of timber tree species used for furniture production, there was a significant difference in the groups of timber products used by furniture producers in the Timber market ($\chi^2 = 13.609$, $df = 3$, $P = 0.003488$).

Common timber species fairly used in furniture production

Bitter kola, Iroko, Mahogany, Obeche, Bush-mango and Tiger-wood were reported to be fairly used and represents 23.26% of all responses in timber market, Aba.

Timber species not used in furniture production

About 18 responses to the utilization of individual tree species in furniture production representing 8.99% of all responses in timber market, Aba reported that Bitter kola, Black afara, Obeche, Tiger-wood and White afara were not used for furniture production.

Timber species that are rarely used in furniture production

In timber market, Aba some species like Bitter kola,

Black afara, Iroko, Mahogany, Obeche, Bush-mango and White afara were said to be rarely used based on 25 responses of individual tree species representing 15.81% of all responses in timber market, Aba.

Very common timber species used in furniture production

Achi, Bitter kola, Black afara, Gmelina, Iroko, Mahogany, Obeche, Bush-mango, Tiger-wood, Whistling pine and White afara were reported to be most commonly used in future production in timber market, Aba based on 31 responses to individual species representing 51.93% of all individual responses. These timber species were chosen based on diverse considerations, including social and economic factors. This has led to a large number of species generally being referred to as lesser known species (LKS), less used species (LUS), unpopular species (rarely used) and secondary species (Freezaillah, 1984).

The tick line indicates the median, the range below the median indicate 25% region of the data point, while the region above the median line indicate 75% of the data points (Figure 1). The dots above indicate outliers. The bars are called whiskers and represent 95% confidence interval. Iroko (15.7% of all business units), Mahogany (14.4%) and Black afara (13.6%) timber species were mostly used by the various business units in Aba Timber market for furniture production. Achi (1.6% business units) and Whistling pine (1%) were the least used timber species in Aba Timber market.

Very common lumber dimensions used in furniture production

About 32 business units in Aba Timber market reported that 1" x 12" x 12' lumber dimension were mostly used in furniture production, followed by 1" x 6" x 12' (30 business units) and 1½" x 3" x 12' (25 business units) (Table 3). In addition, different lumber dimension such as, 3" x 6" x 12' and 3" x 12" x 12' were reported to be very commonly used by the following business units.

Table 4 summarizes the type and volume of wood used to construct some of the furniture like dining table, bed, chairs, cupboard etc. on weekly basis. About 10-30% volume of Tiger-wood, Achi were reported to be used on weekly basis to produce furniture by 10 business units in timber market, Aba, 30-50% volume of bitter kola and Obeche were used to construct furniture by 14 business units on weekly basis. About 12 business units reported that they used 60-80% volume of Bush-mango and White afara to construct furniture, 80-100% volume of Black afara, Iroko and mahogany were used by 17 business units to produce furniture. Thus, the furniture making markets in developing countries can be improved by planting more trees and improving the management practices of the existing forest resources (Semana, 1977).

Conclusion

Wood still remains an important raw material which plays major role in various construction works and can

be put into different utilization purposes. It is therefore necessary to widen species utilization to increase value and profit, without expanding the area of harvest. Making available information on the resource base, outputs from research and development, as well as carrying out systematic and aggressive marketing and above all, cooperation between consumers and producers are vital in furniture making. Efforts at regenerating promising species should be fostered, as research on these species continues to further adjust and manipulate their properties to improve value.

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Table 1: Demographic information on the respondents

Variables	Category	Frequency	Percentage
Sex	Male	25	46.4
	Female	10	18.7
Age	20-30	32	45.7
	31-40	15	26.6
	41 and above	7	11.7
Marital Status	Single	13	28
	Married	17	29.9
	Divorced	3	5.1
Education Background	No education	15	27.9
	FSLC	15	21.4
	WAEC/GCE	13	21.6
	OND	3	3.9
	HND/B.SC	4	5.3

Table 2: Number of responses on the use of individual timber species in furniture production

Species	Scientific name	Fairly				Total
		common	Not used	Rare	Very common	
Achi	<i>Brachystegia eurycoma</i>	0	0	0	10	10
Bitter kola	<i>Garcinia kola</i>	19	10	14	30	73
Black afara	<i>Terminalia ivorensis</i>	0	10	10	63	88
Gmelina	<i>Gmelina arborea</i>	0	0	0	28	28
Iroko	<i>Milicia excelsa</i>	22	0	12	67	101
Mahogany	<i>Khaya spp.</i>	19	0	14	60	93
Obeche	<i>Triplocliton scleronxylon</i>	24	14	13	15	66
Bush mango	<i>Irvingia gabonensis</i>	22	0	14	30	66
Tiger-wood	<i>Lovoa trichilioides</i>	20	10	12	1	43
Whistling pine	<i>Casuarina equisetifolia</i>	0	0	0	6	6
White afara	<i>Terminalia superba</i>	24	14	13	20	71
Grand total		150	58	102	335	645
Percentage		23.26	8.99	15.81	51.93	

Table 3: Various lumber dimensions collected from timber market, Aba for production of furniture

S/N	Various dimension of lumber used	(VC) Very common	(FC) Fairly common	(R) Rare	(NU) Not used
1	1" x 12" x 12'	32	0	0	0
2	1" x 6" x 12'	30	17	11	11
3	1" x 4" x 12'	30	15	15	0
4	1½" x 6" x 12	25	18	14	2
5	3" x 12" x 12	12	11	11	0
6	3" x 3" x 12	10	0	0	0

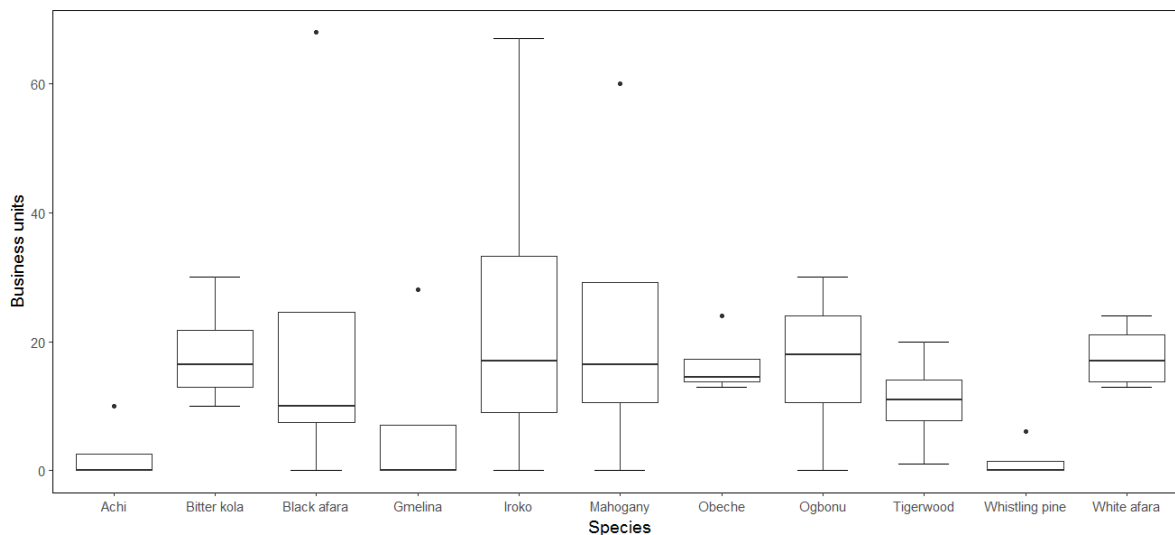


Figure 1: A box plot of the number of business units that use different timber species.

Source: R core team, (2018)

Table 4: Types and percentage volume of wood used to construct some of the furniture on weekly basis

S/N	Species	Volume (%)	Frequency
1	Tigerwood, Achi	10-30%	10
2	Bitterkola, Obeche	30-50%	14
3	Bushmango, White afara	60-80%	12
4	Black afara, Iroko, Mahogany	80-100%	17