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USE OF WOOD RESIDUES FROM TIMBER SHED BY RESIDENTS OF ABAKALIKI COMMUNITIES AND ITS ENVIRONS IN EBONYI STATE, NIGERIA

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ABSTRACT

Wood residues have always been a major concern to residents living in areas where sawmills are located. Wastes generated in these Timber Shed include: sawdust, slabs, tree barks, wood dust, wood shavings and wood offcuts. This paper focused on assessing the utilization of wood wastes by residents living around Timber sheds and sawmills in Abakaliki. A multi-stage random sampling technique was used to select residents in the study area. Information was collected through the use of well-structured questionnaire, in depth interviews and personal observations. The data generated were analyzed using descriptive statistics. The outcome of the results indicated that majority of respondents (59.2%) were married, with most of them having 4 - 6 family members. Also, majority of the respondents by 57.1% obtained their wood residues from timber shed freely. Majority of the respondents by 49% agreed to the use of wood residues for heating and cooking. Other wood residues use found among the communities' dwellers include bedding for poultry/other animals (18.4%), flooring, mulching (9.2%) and planting of ornamental plants (7.1%). Wood residues if effectively maximized would help in reducing the overexploitation of the natural forest and thus help in conservation.

***Keywords*:** Timber shed, wood residues, sawdust, Off-cuts, Abakaliki

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INTRODUCTION

Industrialization has brought mixed benefits to mankind. Since the dawn of civilization, industries have been established to meet various human needs (Ugheoke *et al.,* 2006). Forest industries engage in the processing and efficient utilization of timber, and also a producer of semi-finished intermediate goods for other sectors (Ogunwusi and Jolaoso, 2012). However, timber sheds generate various wood residues which include sawdust, wood offcuts, wood shavings and wood offcuts (Dosunmu and Ajayi, 2002). Biomass fuels especially fuelwood and charcoal can be gotten. These are highly demanded by both households and industrial sectors in all ecological zones of the country.

Nigeria generates about 1.8million tons of sawdust annually and 5.2million tons of wood wastes (Owoyemi *et al*., 2016). The humongous volume of wood waste generated annually can be linked to the fact that wood is the most multipurpose raw materials the world has ever known and the implication of this, is high deforestation rate. At every level of wood processing production, some amounts of wood wastes are generated and due to mismanagement, they are accumulated to form heaps causing

environmental hazards, some find their ways into nearby water bodies causing drainage blockage, pollution for the aquatic animals in these waters. Some are indiscriminately burnt, releasing dangerous gas into the atmosphere thereby polluting the air as stated by (Dosunmu and Ajayi, 2002; Aina, 2006; Aiyeloja *et al*., 2013). They contain significant spectrum of organic substances capable of producing adverse effects on the physical, chemical and biotic environment and indirectly affect human health (FAO, 1991).

Sonigitu (2011) revealed that one of the major problems limiting high level utilization of wood waste over the years in Nigeria was that no concrete effort made to incorporate fuel burners into the wood processing companies. The amount of residues called waste, generated from wood industries cannot be undermined and these residues are not efficiently conserved, preserved and utilized. Waste management of all kinds including wood waste has been of a great concern to every responsible, responsive and sensitive government or any environmentally friendly organization.

This study was aimed at assessing the utilization of wood wastes by residents living around Timber sheds in Abakaliki. This is expected to provide background information on the types, pattern and quantities of wood residues utilized and how these may change in line with certain factors. Government at different levels has been making a consistent effort in embarking on enlightenment programs on how to convert waste to wealth.

MATERIALS AND METHODS

Study area

Chief Linus Edeh Memorial Timber Shed located in Abakaliki in Ebonyi state falls within latitude 6° 19° and 29° 46° north and longitude 8° 06° and 49° 25° East (Fig.1). Ebonyi state is located in the South Eastern part of Nigeria and is divided into three senatorial zones which are Ebonyi North, Ebonyi Central and Ebonyi South and thirteen local government areas. Abakaliki is in the Northern part of the State, it is also the biggest city and the state capital.

The city has a tropical wet and dry climate, relative humidity of 79.7%, and its vegetation falls within the derived Savannah. In Abakaliki, the wet season is warm, oppressive, and overcast and the dry season is hot, muggy, and partly cloudy. At the time of the research, the timber shed was roofed and arranged in lines with several sheds in each line. Each shed was an open small scale factory with an average of 5-8 workers. The wood was sawn, planed, curved and grooved with various types of machines.

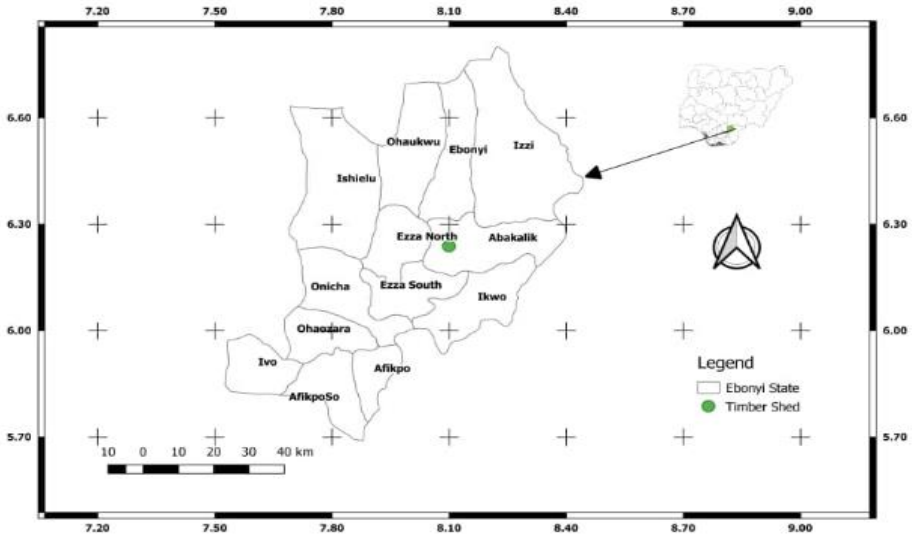

Figure 1: Map showing the peri–urban communities used as the study area.

Plate 1: Heaps of wood residues, mainly comprising of sawdust at the Timber Shed

Experimental Design

The targeted respondents of this study were residents of abakaliki and ezza north where the timber shed was located which were the two communities involved. They were purposively selected for the study due to proximity. A multi-stage random sampling technique was used to select residents in the study area. A total of one hundred (100) residents were randomly selected to fill the questionnaires designed in such a way that respondents stated Purpose of usage, wood residues and weekly expenditure in acquiring wood waste.

Data Collection and Analysis

Information was collected from residents in close proximity to the Timber Shed through the use of structured questionnaire. Only ninety-eight (98) copies of the questionnaire were used for analysis, as two (2) of the copies were discarded due to mismatched information. Oral interview was also used for relevant information. The data obtained were statistically analyzed using simple descriptive statistics such as percentages and frequency counts.

RESULTS

Social-economic characteristics of the sampled respondent of the studied area

Results showed that majority of the respondents (59.2%) were married while 24.5% of them were single with divorced rate of 4.1% and number of widowed were at 12.2% (Table1). About 39.8% of the respondents had a family size of 4 to 6 people, while least percentage falls within the family size >12 people in the community. It was presented in Table 1 that respondents with the highest amount of income were 6.1 % while 3 % refuses to give any response regarding their monthly income (Table 1).

Table 1: Social-economic characteristics of the sampled respondent of the studied area

Variable	Frequency	Percentage (%)
Age		
15-25yrs	16	16.3
25-35yrs	55	56.1
35-45yrs	24	24.5
45-55	3	3.1
Marital Status		
Single	24	24.5
Married	58	59.2
Divorced	4	4.1
Widow	12	12.2
Total	98	100
Level Of Education		
Primary	3	3.1
Secondary	57	58.2
Tertiary	34	34.7
No formal	4	4.1
Total	98	100.1
Occupation		
Farmer	22	22.5
Timber Dealer	16	16.3
Petty traders	27	27.6
Government worker	12	12.2
Private worker	10	10.2
Teacher	5	5.1
Unemployed	6	6.1
Total	98	100
Family Size		
1-2	14	20.4
4-6	60	39.8
7-9	18	19.4
10-12	4	17.3
>12	2	3.1
Total	**98**	**100**
Gender		
Male	19	19.4
Female	79	80.6
Level of Income (Per Month)		
Less than 10000	8	8.2
10100-20100	9	9.2
20100-30000	30	30.6
30100-40000	27	27.6
40100-5000	15	15.3
Above 50000	6	6.1
No response	3	3.0
Total	98	100

Respondents weekly expenditure in acquiring wood residue in the study

As presented in Table 2, majority of the respondents (57.1%) obtained their wood residues for free of charge while 17.4 % of the respondents obtained their wood residues by being charged between N500 to N700 weekly. This study further revealed in Table 2, that 8.2 % of the respondents do spent above N900 weekly to obtain wood residues, while 7.1 % of the respondents had no response to the expenses acquired on collection of wood residues.

Table 2: Respondents weekly expenditure in acquiring wood residue in the study

Weekly expenditure	Frequency	Percentage (%)
Obtained free	56	57.1
500-700	17	17.4
700-900	10	10.2
>900	8	8.2
No Response	7	7.1
Total	**98**	**100**

Purpose for which wood residues are utilized by respondents in the study area

Furthermore, in table 3, 49% of the respondents in the communities stated that wood residues were used for the purpose of heating/cooking. It was shown that up to 18.4% of the respondents in the study area stated that wood residues were used for poultry/other animals' bedding. Although, 8.2% and 7.1% used it for mulching and planting respectively, with only 2% of the respondents refusing to give any response.

Types of wood residues that is been used by respondents in the study area

The results from table 4 showed that higher percentage of respondents used offcuts from wood for cooking while 10% used wood slabs for floor covering.

Table 3: Purpose for which wood residues are utilized by respondents in the study area

Purpose of usage	Frequency	Percentage (%)
Heating and cooking	48	49
Poultry/other animals'bedding	18	18.4
Mulching	9	9.2
Heating/cooking, poultry/ other animals' bedding	6	6.1
Animals bedding and flooring	8	8.2
Planting	7	7.1
No response	2	2
Total	**98**	**100**

Table 4: Types of wood residues that is been used by respondents in the study area

Types of Wood Residue	Purpose of Usage	Frequency	Percentage (%)
Sawdust and wood shavings	Heating/cooking, Flooring, Poultry/other animals' bedding, Planting	35	35.7
Off–cuts from wood	Heating/cooking	55	56.1
Wood slabs	Flooring	8	8.2
Total		**98**	**100**

DISCUSSION

The analysis of income of the respondents significantly revealed that most earned between ₦20,000 to ₦50,000 monthly when compared with those that earned between less than N10,000 monthly indicating their interest in the collection and use of wood residues. The low income of most of the respondents may implies their collection of waste to support themselves in various ways. Some of respondents' western educational level influenced their responses relating to the use of wood residues in the study area. This backs up some past studies that explained that the higher the educational level the lower the applications of wood residues. The use of Timber Shed wood residues for cooking would be overcome with modern methods of use of electric, gas and kerosene stove in the houses of people with high level of education. This is in support of view by Nnaji *et al*., (2012) showing that educational level is a key factor influencing wood residues usage in Nigeria. However, 17.4% of the respondents in the communities, claimed to spend between N500 and N700 weekly indicating a low cost procurement of wood residues from sawmills, reason being that wood residues mostly appeared not to be useful in timber sheds as sustainable value– added usage according to Erakhrumen and Idele, (2016).

Wood residues were also used in poultry and other animal's bed (litter for bed), planting and mulching aside from cooking. Although, the applications of these wood residues in this study area still appear limiting in terms of economic advantages and environmental considerations Larinde *et al.,* (2018). As reported by the study there is no doubt that the sawmills contributes to the local economy in one way or the other but it's beyond the scope of this report.

CONCLUSION and RECOMMENDATION

In view of this study, it has become imperative that different wood wastes are being generated in Timber-shed, Abakaliki, Ebonyi State. The study also showed that ultilization of wood waste residues contributed substantially to energy needs of people whether obtained for free or paid for. Therefore, government and all stakeholders in forestry profession should promote policies and guidelines aimed at increasing the utilization quantity of these wood residues in the provision of energy for both household and industrial use. These wood wastes if fully utilized will help in reducing the overexploitation of the natural forest and thus help in conservation.

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