



## ANALYSIS OF SAWN WOOD MARKET STRUCTURE IN BENUE STATE, NIGERIA

Idoko, S. S. and Tee, N. T.

Department of Social and Environmental Forestry, College of Forestry and Fisheries  
Joseph Saawan Tarka University (JOSTUM), Makurdi, Nigeria

### ABSTRACT

*The paper analysed the structure of sawn wood markets in Benue State. A multi-stage sampling technique was used to select respondents. A total of 100 sawn wood marketers from five Local Government Areas (LGAs) in the State were selected and sampled, Copies of semi-structured questionnaire were used to elicit data for the study. The Market structure was analyzed using concentration ratios such as Lorenz curve and Gini coefficient. The analysis of the distribution of the sales income of sawn wood marketers in Benue State revealed a Gini coefficient of 0.26. The Lorenz curve for the income distribution of sawn wood marketers in the State showed a little departure from the 45<sup>o</sup> line and this is in line with the GC of 0.26. This implied a low variation in incomes and sales distribution of sawn wood marketers in Benue State. It also showed a low market concentration of timber traders, which implied a fairly equitable distribution of marketing agents in the state. A summary of the sawn wood market structure in Benue State indicated that the market structure studied was oligopolistic i.e. few sellers and many buyers.*

**Key words:** Sawn wood, Markets, structure

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### INTRODUCTION

Sawn wood marketing involves the exchange between a wood buyer and a seller at a given price for profit maximization (Ohwo and Adeyemi, 2015). It entails the sum total of business activities involved in the production and movement of sawn wood from point of production to the consumers (Bauer and Yameh, 1993). In Nigeria, sawn woods are marketed locally in sawmills and wood sheds, with sawmills accounting for about 93.32% of total number of wood-based industries in Nigeria (Fuwape, 2001). Reports have shown that sawn wood marketing contributes to livelihoods in Nigeria (Sekumande and Oluwatayo, 2011) and globally (Giliba, 2010).

Market structure refers to certain characteristics of the market, which are believed to influence its nature of competition and the process of price formation. These characteristics according to Adegeye and Dittoh (1985) include: size and number of buyers and sellers ensuring adequate intensity of price and quality competition; freedom of entry and exit and the

extent of product differentiation (Ebe, 2007; Kotler *et al.*, 2007). The major characteristics that economists have focused on in describing the market structure are the nature of competition and the mode of pricing in that market. The market structure will affect how firms price their products in the industry. For example, in a competitive market, the firms are price takers, while the monopoly industry has the sole duty of price setting. A market structure will affect the supply of different commodities in the market and affect the barrier to entry for companies that tend to join that market. According to Sambe *et al.* (2016), market structure defines the marketing system of different types of enterprises, their behaviour and the relationships, as well as the relationship among various sellers and buyers, and between buyers and sellers. The structure of the forest produce market in Nigeria is monopolistic, implying the existence of one major supplier (government) and many buyers. In an ideal economic situation, the market structure of timber markets should have profound implications on the prices and by extension on

the conduct and performance of the market (Popoola, 1998). The structure of forest product market, as it is presently, is bereft of good performance. According to Popoola (1998), structural and institutional weaknesses exist in the Nigerian market, hence the failure of the market to operate effectively. This paper, therefore, takes a look at the sawn wood market structure in Benue State.

## METHODOLOGY

### *Study Area*

The study was carried out in Benue State, located in the north central region of Nigeria. Benue State is bounded in the Southwest by Cross river state, Enugu State and Ebonyi State; in the Southeast by the Republic of Cameroon; in the West by Kogi State and in the Northeast and East by Taraba State. The State has three agro-ecological zones, namely; the Derived Savanna, the Guinea Savanna and the lowland rainforest (Keay, 1949). It lies between latitude 6°25' and 8°08'N and longitude 7°47'E and 10°E and has an area of 30,910 km<sup>2</sup> (FORMECU, 1998). According to the result of the 2006 National census, Benue State has a total population of 4,219,244 as against 2,780,398 in 1991 (NPC, 2006). The population of the State was projected to 5,741,800 at 3% annual growth rate in 2016 and projected to 6,141,300 at 2.3% annual growth rate in 2022, with a population density of 199.5/km<sup>2</sup>. The State has a total of 23 LGAs which are divided into three geo-political zones. Benue State has a tropical sub-humid climate, with two distinct seasons, namely; a wet season and a dry season. Open woodland with tall grasses (1-3m high) and trees (up to 15m high) characterize the vegetation of Benue State. The trees are mostly savanna trees with short boles, thick barks and broad leaves.

### *Sampling Technique and Sample Size*

A multi-stage sampling technique was adopted for the selection of the respondents. The first stage involved the purposive selection of five LGAs with the largest sawn wood markets and marketers in the State. The LGAs selected are; Makurdi, Gboko, Otukpo, Okpokwu and Katsina-Ala. The LGAs were selected because of their spatial distribution, market sizes, relative abundance of sawn wood marketers and availability of sawn wood species in them. A total of 100 sawn wood marketers were randomly selected from the timber markets in

the LGAs as respondents. One hundred (100) copies of Semi-structured questionnaire were used as the main instrument of data collection for this study. Data collected included, among others, those on the distribution of the marketers' sales income, ease of entry and exit into the market, the number and relative size of buyers and sellers, the degree of product differentiation and the status of knowledge about costs, prices. Other data collected were information on the method of price determination, existence of traders' association, membership of association, activities of the association, benefits derived from the association, method of product advertisement/promotion, sources and knowledge of market information, sources of start-up capital and entry barriers.

### *Data analysis*

Market structure was analyzed using concentration ratios such as Lorenz curve and Gini coefficient. An important variable in market analysis is concentration, which explains which segment of the market possesses the largest share of the market or business. In this study, the concentration of timber marketers was determined by means of Gini-coefficient (GC) and the accompanying Lorenz curve. The Lorenz curve is a graph used in economics to show income distribution or spread. The Lorenz curve is obtained by plotting the cumulative proportions of sellers, from the smallest to the largest, against their cumulative sales. In this curve, the cumulative percentage of the sellers was plotted on the X axis, while their respective cumulative percentage of income was on the Y axis. These were then joined to produce the Lorenz curve. The line of equal distribution (LED) or the egalitarian line is a straight line from the origin. It is 45° to the origin. If the distribution of sales/income is completely equitable, the curve will pass through the 45-degree line. The greater the inequality, the greater the deviation from the 45-degree line.

Gini coefficient was determined from the Lorenz curve as the ratio of the area above the Lorenz curve to the sum of the area above and below the curve as shown below

$$GC = \frac{A}{A+B} \dots\dots (1)$$

Where

GC= Gini coefficient

A= proportion of the population above Lorenz curve

B= proportion of the population below Lorenz curve

GC=0 implies perfect equality

GC=1 implies perfect inequality

GC=0<1 implies a degree of inequality

Gini coefficient was used to examine the distribution of sales income of sawn wood marketers, which is a reflection of the market structure in the study area. The Gini coefficient varies from 0 to 1, where 0 implies perfect equality in the distribution (perfect market) and 1 implies perfect inequality (imperfect market).

The closer the Gini coefficient is to zero, the greater the degree of equality in sales income/volume, the lower the level of concentration and the more competitive the markets are. Similarly, as the Gini coefficient approaches unity, the greater the degree of inequality, the higher the level of concentration, the more imperfect the markets are and, consequently, the lower the efficiency of such markets.

## RESULT

### *Demographic characteristics of sawn wood markets in Benue State*

The result showed that 97.0 % of the marketers were males. The age distribution of the marketers indicated that 83 % were young men of less than forty (40) years and 81.0 % were married. The majority (45.0 %) had 4 to 6 persons in their households, while 99.0 % of the marketers had at least primary school education. Most of them (61.0 %) were indigenes of the State and 87.0 % had trade experiences of at least 5 years. The result is presented in Table 1.

### *Structure of sawn wood markets in Benue State*

The result of the structure of sawn wood market in Benue State as revealed by the estimate of Gini Coefficient is presented in Table 2.

### *Lorenz Curve for Income Distribution of Sawn Wood Marketers in Benue state*

The Lorenz curve relating the cumulative proportion of total sales and the cumulative proportion of sawn wood marketers in Benue State is as shown in Figure 1.

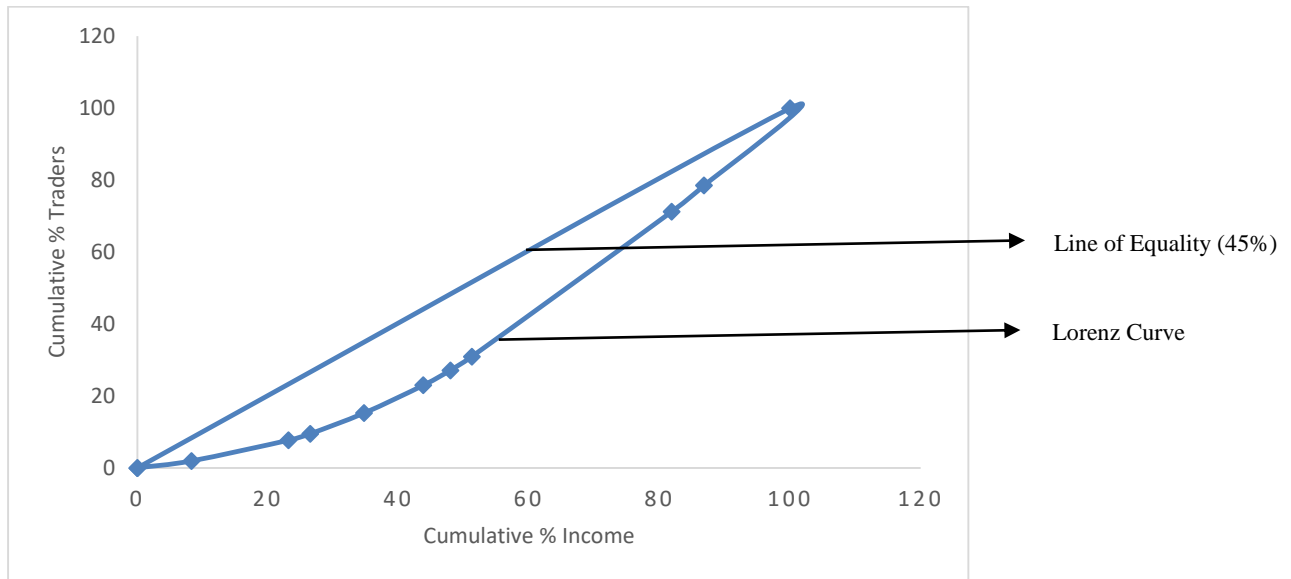
**Table 1: Demographic characteristics of sawn wood marketers in Benue State**

<b>Variables</b>	<b>F (N=100)</b>	<b>%</b>
<b>Gender</b>		
Male	97	97.0
Female	3	3.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Age (Years)</b>		
15-20	13	13.0
20-29	40	40.0
30-39	30	30.0
40-49	15	15.0
50-59	2	2.0
60 and above	0	0.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Marital status</b>		
Single	18	18.0
Married	81	81.0
Separated	-	-
Divorce	-	-
Widowed	1	1.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Household Size</b>		
1-3	26	26.0
4-6	45	45.0
7-9	26	26.0
10 and above	3	3.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Education</b>		
No formal education	1	1.0
Primary School	15	15.0
Secondary School	43	43.0
Tertiary School	41	41.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>State of origin</b>		
Benue	61	61.0
Non-Benue	39	39.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Years in the trade(experience) (yrs)</b>		
< 5	13	13.0
5-9	19	19.0
10-14	24	24.0
15-19	20	20.0
20-29	15	15.0
25-29	3	3.0
30 and above	6	6.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>State of origin</b>		
Benue	61	61.0
Non-Benue	39	39.0
<b>Total</b>	<b>100</b>	<b>100</b>
<b>Type of marketer</b>		
Wholesaler	2	2.0
Retailer	38	38.0
Both	60	60.0
<b>Total</b>	<b>100</b>	<b>100</b>

**Table 2: Gini Coefficient Estimation of Income Disparity of Sawn Wood Marketers in Benue State**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5= 1x2</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9= 3x8</b>
<b>Monthly Income</b>	<b>Mid-Point</b>	<b>Freq. of Traders</b>	<b>% Traders</b>	<b>Cumulative % Traders</b>	<b>Total Income</b>	<b>% Total Income</b>	<b>Cumulative % Total Income</b>	<b>Paired Sum</b>	<b>Trapezoidal Area</b>
<20,000	15000	10	8.26	8.26	150000	1.92	1.92	1.92	15.87
20000-29900	25000	18	14.88	23.14	450000	5.76	7.68	9.6	142.81
30000-39900	35000	4	3.31	26.45	140000	1.79	9.47	17.15	56.69
40000-49900	45000	10	8.26	34.71	450000	5.76	15.23	24.7	204.13
50000-59900	55000	11	9.09	43.8	605000	7.74	22.97	38.2	347.27
60000-69900	65000	5	4.13	47.93	325000	4.16	27.13	50.1	207.02
70000-79900	75000	4	3.31	51.24	300000	3.84	30.97	58.1	192.07
80000-89900	85000	37	30.58	81.82	314500	40.24	71.21	102.18	3124.51
90000-99900	95000	6	4.96	86.78	570000	7.29	78.5	149.71	742.36
100000 and above	105000	16	13.22	100	168000	21.50	100	178.5	2360.33
Total	-	121**	100		7815.00	100			7393.07

\*\* Multi-choice responses by respondents, therefore total frequency is higher than total number of respondents



**Figure 1: Lorenz curve of income disparity of sawn wood marketers in Benue State**

## DISCUSSION

The analysis of the sales income of sawn wood marketers in Benue State revealed a Gini coefficient of 0.26. In absolute terms, this implies that there is a low degree of inequality among the sawn wood market actors in Benue State, and therefore, market, tended towards competition. This is in agreement with Sambe *et. al.* (2016), who reported that the overall structure of timber markets in Benue State indicated that there were many small-scale dealers such that none could control the market. This type of market structure is competitive because the individual dealers had little influence on the market prices. Generally, the following factors of workable competition characterized the sawn wood market in Benue State. They included: adequate number of buyers and few sellers, freedom of entry into the market by new participants with only the requirement of registering with the market union, presence of collusion and price discrimination in some cases.

The operations of timber markets in Benue State were partially de-regulatory. Government involvement is more in the fixing of prices of standing trees and collection of revenues from the marketers. Government's involvement in terms of price control boards, subsidies and loans were completely absent. Those areas were left in the hands of sawn wood marketers

and the buying public. Naturally, the absence of regulatory bodies pre-supposes that the forces of demand and supply of sawn wood products in the market should be effectively competitive. Following Sosnick (1968) as mentioned by Tee (2007), a market is effectively competitive if and only if it is free from two kinds of flaws. These are: conditions that are considered undesirable both in them and in their effects, and conditions that are considered undesirable only because of their effects. The first conditions comprise unfair tactics, and irrationality as depicted by self-defeating choices by buyers and sellers. Unfair tactics include malicious interference with competition, fraud against customers or suppliers, sale of inherently bad products without notice. The second condition comprises inadequate research, undesirable discrimination and undesirable collaboration, predation, pre-emption and refusals to deal. In view of these, sawn wood markets in Benue State could not be said to be perfectly or effectively competitive, because it was not free from such flaws. Competitors employed different tactics to ensure they acquired large share of the market. Some also engaged in malicious practices such as selling wood at dimensions less than the standard market dimensions to unsuspecting customers. Furthermore, there were no persons employed by the buyers to seek ways of improving products

quality and reducing costs. There were also clear cases of collaboration since marketing associations were in existence in all the timber markets in the State.

The Lorenz curve for the income distribution of sawn wood marketers in Benue State showed a little departure from the 45<sup>o</sup> line and this is in line with the GC of 0.26. This implied a low variation in incomes and sales distribution of sawn wood marketers in Benue State. It also showed a low market concentration of timber traders, which implied a fairly equitable distribution of marketing agents in the state.

A summary of the sawn wood market structure in Benue State revealed that:

- There were many small scale buyers and few sellers, of which are large enough to wield price settings and volumes of trade
- There was competition in the marketing of products.
- Most products were homogenous and substitutable.
- There were no barriers to entry into the market or exit. Every marketer had freedom of entry and exit once the minimum condition of registration is fulfilled.
- The information transmission medium was effective. It was majorly achieved through their market associations/unions.

Based on the theoretical models of market structure propounded by Bain (1972), and Adegeye and Dittoh (1985), the aforementioned features indicated that the market structure studied was oligopolistic i.e. few sellers and many buyers. This finding corroborates with the report of Popoola (1998), Idoko (2007) and Sambe (2016) on sawn wood markets in Benue state.

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## CONCLUSION

Sawn wood marketing contributes to livelihood sustainability through employment and cash income generation in the rural and urban communities in Benue State. The structure of sawn wood markets in Benue State affects the pricing and marketing of sawn wood in the State. This happens mostly through market competition. The demographic attributes of sawn wood marketers in Benue State revealed that most of them were indigenes of the state, males, young, energetic and responsible, which could have significant effects on the level of competition in the market. The Lorenz curve for the income distribution of sawn wood marketers in Benue State showed a little departure from the 45<sup>o</sup> line and this is in line with the GC of 0.26. The Gini coefficient of 0.26 implied that there was a low degree of inequality among the sawn wood market actors in Benue State, and therefore, market, tended towards competition. There were also many buyers and few sellers in the markets. The overall structure of the market showed that the sawn wood markets in Benue State were oligopolistic in nature and the State government involvement is more in the fixing of prices of standing trees and collection of revenues from the marketers. Improvement in the sawn wood market structure in Benue State will ensure an efficient marketing system that is highly competitive. There is, therefore, the need for an improved sawn wood structure in State. It is recommended that the State government increases its participation in sawn wood marketing activities. This it can do in the areas of price regulation, provision of subsidies, basic amenities (such as good roads, water, electricity etc) and loans to marketers, reduction of the prices of petroleum products and improvement of security in our forests, timber markets and the entire country.

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