Analysis of Timber Market Structure and Efficiency in Benue State, Nigeria

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**Authors’ contributions**

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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**ABSTRACT**

This study analyzed timber market structure and efficiency in Benue State. Applying a multistage sampling approach at 30% sampling intensity, seven out of 23 Local Government Areas in the State were sampled for the study. A total of 256 respondents (164 timber traders, 79 chainsaw millers and 13 sawmillers) were sampled and interviewed using copies of semi-structured questionnaire to elicit data for the study. These were collated and analyzed using marketing efficiency and Gini–coefficient to determine timber market concentration and efficiency. Gini-coefficient values were 0.1699 in Zone A, 0.3394 in Zone B, and 0.1917 in Zone C. This implies low concentration of timber traders in the timber market, indicating a fairly equitable distribution of timber traders in the study area. Chainsaw millers’ Gini-coefficient values were 0.1891 for Zone A, 0.3218 for Zone B and 0.1829 for Zone C. Those of sawmillers were 0.2885 for Zone A and 0.2195 for Zone C. The marketing efficiency of timber traders in Zone B was 134.27%, followed by 131.52% for Zone C and 122.13% for Zone A. Similarly, chainsaw millers’ marketing efficiency were 184.19% in Zone A, followed by 179.38% in Zone B and 161.80% for Zone C. Finally, Sawmillers’ marketing efficiency for Zone C was the highest (284.66%), followed by Zone A.

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Timber marketing is therefore, a viable and efficient enterprise in Benue State. Sustainable management of forest resources in the state should be maintained for continuous supply of timber in the state.

Keywords: Timber market; market structure; marketing efficiency.

1. INTRODUCTION

Timber plays a significant role in the nation’s socio-economic development with relevant benefits to human welfare [1]. The benefits range from its usefulness for interior and exterior decorations in homes and industries, production of electric poles, plywood, pulpwood, veneers, and planks needed by building and construction industries [2]. Timber therefore impacts the rest of the economy by making positive contributions to raw material production and supply for construction purposes, furniture making and packaging among others [3]. By virtue of its proximity to the rural areas, close to the source of supply of raw materials, the industry stimulates the dissemination of technical skills from subsistence economy to an industrialized economy. These benefits could be sustained through efficient production, distribution and utilization. Efficient distribution and utilization may reduce wastages, and hence the pressure on the forest and its rate of disappearance.

Timber marketing is an asset in the economy of timber. According to Lintu [4], marketing provides a means through which people can create efficient economic value for their resources and products. Consequently, efficiency in timber marketing is an economic asset to the forestry sub-sector for a sustained resource production, distribution and consumption. An efficient marketing system of timber will provide a means for maximising products’ values and also stimulating equitable distribution of its economic benefits among the different actors in the market [5,6].

Market structure deals with how a market is organised. It 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. Market structure is therefore concerned with the organizational characteristics of a market, which influence the nature of competition and pricing within the market. It can further explain which segment of the market possesses the largest share of the market or business. Concentration, which shows the nature of the market and the pricing system, is very important in market structure analysis [7]. From the foregoing, a good market structure influences the efficiency of a market. Thus, Adegeye and Dittoh [8] maintained that an efficient and good marketing system can only operate where there is good market structure and conduct in place and it is fully utilized.

Marketing efficiency is the provision of the best services to producers and consumers consistent with the prices both are willing to accept [9]. It is the achievement of the highest return on the resources employed. The efficiency of marketing is therefore a function of what comes out from its structure, conduct and performance. Thus, Popoola and Rahji [10] posited that an efficient marketing system is a prerequisite for increased and sustained production, and so, it is relevant in stimulating and producing forestry development and economic growth. This therefore helps in appraising the extent to which interaction between buyers and sellers in the market stimulate outcome that are consistent with profit levels, sales volume, utilization and sustainability [11].

The foregoing discussion shows that relevant information on marketing structure and efficiency would be very vital for resource allocation and income distribution in an economy. The information would be very useful in developing appropriate policy interventions to maintain equity and also provide funds, security and physical facilities and effective market performance for economic development. However, there is paucity of information on timber market structure and efficiency in Benue State. In an attempt to narrow this gap and engender development of suitable policies for economic development, this study analyses the efficiency and market concentration of timber market in Benue State.

2. METHODOLOGY

The study was carried out in Benue State, located at longitudes 6°35’ E and 10°E and latitudes 6° 30’ N and 8° 10’ N within the guinea savanna area of Nigeria with a total land mass of 30,955 km² [12]. The state has twenty-three local government areas (LGAs) with a total population
of 4,219,244 as against 2,780,398 in 1991 [13]. Benue State lies in the southern Guinea Savanna. The natural forest types and their distribution show three distinct types namely trees/woodland/shrubs, lowland rain forest and riparian forest. However, the percentage coverage of this natural forest is very small relative to the major land use in Benue state [14].

The study population comprised timber traders, chainsaw operators and sawmillers in Benue State. A multi-stage sampling approach at 30% sampling intensity was applied to select study sites and respondents. This was to ensure equity and a normal distribution of results from the sampled population for the study. Thus, seven LGAs out of 23 in the State were sampled from the three geopolitical zones (2 in zone A; 2 in zone B; and 3 in zone C) for the study. The LGAs were purposively sampled based on the concentration of timber markets and trading activities. The sampled LGAs include Konshisha and Kwande in Zone A, Makurdi and Gboko in Zone B, Otukpo, Opokwu, and Oju in Zone C. From the sampled LGAs, 164 timber traders and 79 chainsaw millers were proportionately sampled for the study. However, due to the presence of only few saw millers (15) in the study area, complete enumeration was applied to draw respondents for this category of the study population. A total of 256 respondents (164 timber traders, 79 chainsaw millers and 13 saw millers) were therefore sampled for the study.

2.1 Data Collection and Analysis

Data for the study were collected using semi-structured questionnaire and personal observations. Three sets of semi-structured questionnaires were designed and administered on timber traders, chainsaw millers and saw millers from the sampled LGAs.

Data was collected and analysed using Gini coefficient and marketing efficiency (revenue cost ratio) expressed in percentages.

2.1.1 Analytical tool

2.1.1.1 Gini coefficient

The Gini-coefficient was used to examine the market concentration of timber dealers, that is, the measurement of the level of seller concentration in the market in order to determine the degree of competition or monopoly in the market. Bila and Bulama [15] used Gini coefficient to determine the degree of market concentration of sellers of grains markets in Eastern Nigeria and Maiduguri Cattle Market respectively by using the formula:

$$G = 1 - \sum \gamma$$  \hspace{0.5cm} (1)

Where,

- $G$ = Gini – coefficient
- $\gamma$ = Percentage of sellers per period of study
- $\gamma$ = Cumulative percentage of total sales (revenue)

The G has a value ranging from 0 to 1 expressing the extent to which the market is concentrated. When $G$ is equal to zero (0), there is perfect equality in the size of the distribution of sellers however, when $G$ is equal to one (1), there is perfect monopoly in the market.

2.1.1.2 Determination of marketing efficiency

Marketing efficiency refers to maximization of the ratio of output in marketing. This study adopted Olukosi and Isitor [16] technique in marketing efficiency. This is represented by equation 2 as:

$$\text{Marketing Efficiency} = \frac{\text{Total Revenue}}{\text{Cost of Marketing}} \times 100\%$$  \hspace{0.5cm} (2)

Total Revenue = Gross Income

Cost of Marketing = (Transportation, taxes, Association dues, loading and offloading, and gifts).

3. RESULTS AND DISCUSSION

3.1 Market Concentration of Timber Traders, Chainsaw Millers and Sawmillers in Benue State

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 traders, chainsaw millers and sawmillers was determined by means of Gini-coefficient (Table 1).

The value of Gini-coefficient for timber traders was 0.16991 or 16.99% in Zone A, 0.33936 or 33.93% in Zone B and 0.19169 or 19.16%
Table 1. Gini coefficient values of timber marketers in Benue State between August and October, 2013

<table>
<thead>
<tr>
<th>Type of marker</th>
<th>Gini coefficient value</th>
<th>Standard error (STE)</th>
<th>Lower bound Gini coefficient</th>
<th>Upper bound Gini coefficient</th>
<th>Confidence level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timber traders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone A</td>
<td>0.16991645</td>
<td>0.05978144</td>
<td>0.05274698</td>
<td>0.28708592</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Zone B</td>
<td>0.33936049</td>
<td>0.21572661</td>
<td>-0.08345589</td>
<td>0.76217688</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Zone C</td>
<td>0.19169795</td>
<td>0.19494520</td>
<td>-0.19038762</td>
<td>0.57378351</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Chainsaw millers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone A</td>
<td>0.18912742</td>
<td>0.05081262</td>
<td>0.08953651</td>
<td>0.57378351</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Zone B</td>
<td>0.32184737</td>
<td>0.14255092</td>
<td>0.04245269</td>
<td>0.60124204</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Zone C</td>
<td>0.18289433</td>
<td>0.05110957</td>
<td>0.08272141</td>
<td>0.28306724</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Sawmillers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zone A</td>
<td>0.28846274</td>
<td>0.12818473</td>
<td>0.03722524</td>
<td>0.53970024</td>
<td>95.00000000</td>
</tr>
<tr>
<td>Zone C</td>
<td>0.21953727</td>
<td>0.11269667</td>
<td>-0.00134414</td>
<td>0.44018467</td>
<td>95.00000000</td>
</tr>
</tbody>
</table>

Source: Computed from field data

in Zone C. This shows low market concentration of timber traders. This means a fairly equitable distribution of marketing agents in the study area. However, there was a relatively higher Gini-coefficient value of 0.33936 for the timber traders in Zone B compared to C and A. This is due to more urban and trade activities, species to cut and accessibility of the zone.

For chainsaw millers the Gini-coefficient values were 0.18912 or 18.91% for Zone A, 0.32185 for Zone B and 0.18289 or 18.28% for Zone C (Table 1). This shows low market concentration of timber traders. This reveals an economically fairly equitable distribution of volume of trade among chainsaw millers in the study area. However, based on the values of Gini-coefficient in each case, trade in zone C was less un-equally distributed followed by zone A and lastly B.

The result of Gini-coefficient values for sawmillers presented in Table 1 were values of 0.28846 or 28.84% for Zone A and 0.21953 or 21.95% for Zone C. The gini coefficient value was not computed for Zone B since it had only one sample. This shows low market concentration of sales volume among sawmillers in the study area. This implies an economically fairly equitable distribution of volume of trade among Sawmillers in the study area. However, based on Gini-coefficient values in each case, trade in zones A and C were more or less the same.

3.2 Efficiency of Timber Trade by Timber Traders in Benue State

The respective total revenues and the costs of marketing presented in Table 2 are N473,240 ($1 = 1220) and N387,490 for zone A, N1,255,900 and N935,330 for Zone B and N1,147,800 and N872,720 for Zone C respectively. Table 2 presents the marketing efficiency in Benue State. The marketing efficiency of timber traders in Zone B was 134.27%, followed by 131.52% for Zone C and 122.13% for Zone A. This means timber marketing in Zone B was more efficient, followed by Zone C and the least in Zone A.

Table 2 presents marketing efficiency of timber traders in zones A, B, and C. Costs were incurred on timber flitches, transport, taxes, loading and off-loading, road charges and others. The analysis of the result showed that the mean monthly gross income for timber traders in Zone A was N473,240 while the mean total marketing cost was N387,490 representing 81.88% of the mean gross income. Expenditures on timber purchase amounting to 82.39% of the total marketing cost was the highest cost followed by loading and offloading (6.75%), and transportation (6.48%). The lowest cost of marketing, which is 0.66% of the total marketing cost, was recorded on dues. Similarly the gross income for timber traders in Zone B was N1,255,900 while the mean total marketing cost was N935,330 representing 74.47% of the mean gross income. Expenditures on timber possessed the highest cost followed by transportation (3.22%) followed by loading and off-loading (1.3%) while others (0.05%) had the least cost. For Zone C, the mean monthly gross income was N1,147,800 while the mean total marketing cost was N872,720 representing 76.03% of the mean gross income. Following the same trend, expenditures on timber (92.38%) had the highest
cost, transportation came next with 3.83% followed by loading and offloading (2.3%), others costs were least with 0.27%.

3.3 Chainsaw Millers Marketing Efficiency in Benue State

The respective revenues and marketing costs of chainsaw millers presented in Table 3 were ₦86,828 and ₦47,140 for Zone A, ₦292,970 and ₦164,240 for Zone B and ₦221,170, and ₦136,690 for Zone C. The marketing efficiency of chainsaw milling was highest for Zone A, with 184.19% followed by 179.38% for Zone B and 161.80% for Zone C. The implication of this result is that in Benue State, chainsaw milling is highly efficient. The mean marketing efficiency of chainsaw millers in zones A and C revealed that chainsaw millers in zone ‘A’ received average gross revenue of ₦86,828 per month. The mean total marketing costs was ₦47,140, representing 54.29% of the mean gross income. A breakdown of the marketing costs revealed that loading and offloading had the highest proportion (30.35%), followed by expenses on timber (25.38%), wages (19.24%), and transport (16.93%). The least cost of 0.75% was incurred on miscellaneous services such as information, goodwill gifts. For zone B the average gross revenue per month was ₦292,970 while the cost was ₦164,240 representing 56.06% of the mean gross income. Expenditure on timber (33.01%) possessed the highest cost followed by wages (30.35%), transport (19.66%) and taxes (5.99%) while the least cost was incurred on miscellaneous services. Similarly the study showed that all chainsaw millers sampled in Zone C received average gross revenue of ₦221,170 per month while the mean total costs was ₦136,690 representing 61.80% of the mean gross income. In the same vein expenditure on timber (30.64%) possessed the highest cost followed by transportation (25.79%), wages (22.10%), loading and offloading 18.48%, while the least cost of 0.83% was recorded on dues.

3.4 Sawmillers Marketing Efficiency in Benue State

The result on the profitability and marketing efficiency of Saw millers is presented in Table 4. Saw millers’ revenue and marketing costs were ₦687,370 and ₦367,240 for Zone A, ₦453,000 and ₦317,000 for Zone B, and ₦1,044,500 and ₦636,930 for Zone C respectively. The marketing efficiency index of saw millers for Zone C was the highest (284.66%), followed by Zone A (187.17%) and Zone B (142.90%). These values are well above 100%, implying that the revenue generated from timber trade by Saw millers is sufficient to offset all costs with reasonable proportions (42.90% - 184.66%) as profit margin. The Sawmilling enterprise in Benue State is therefore profitable, and by extension efficient on that account.

Expenses incurred on timber trade by the Sawmillers were from cost of timber stands, labour for loading and off-loading, transportation cost, road tariffs and other miscellaneous services. Assessment of the most incidental cost incurred by the saw millers showed that in zone A diesel/oil and vehicle maintenance (25.53%) was the most incidental cost, followed by wages (18.98%), transportation (17.78%), expenses on timber (14.60%) and electricity bills (0.83%). Similarly, in Zone B, wages (27.13%), had the highest incidental cost, followed by transportation (18.93%), taxes (17.35%) and expenditure on timbers (14.72%). Other Miscellaneous costs had zero incidental cost, while electricity bills (1.26%) had the least incidental cost. In the same vein, in Zone C, expenditure on timber (39.09%) possessed the highest incidental cost. The second cost component with high incidence was transportation (18.99%), followed by rent and other miscellaneous costs (11.46%) each, while cost of loading and offloading (0.36%) had the least cost incidence. The remaining items of cost were vehicle maintenance and diesel/oil, electricity bills, rent and taxes.

3.5 Concentration and Efficiency of Timber Trade in the Study Area

Market concentration in market structure is concerned with the organizational characteristics of a market which influence the nature of competition and pricing within the market. According to Todaro [17], for economic variables with relatively equitable distribution, the Gini coefficient value should be between 0.20 and 0.35.

According to Todaro [17], for economic variables with relatively equitable distribution, the Gini coefficient value should be between 0.20 and 0.35.

United Nations Development Programme, UNDP [18] reported that Gini-coefficient with high inequality typically lies between 0.5 and 0.7. This suggests that saw miller and chainsaw operators were not able to control large shares of wood supply or sales in the study area. As such none could influence supplies by increasing or decreasing the quantity supplied. Each of the participant's output was an insignificant part of the volume of trade in the market such that it could not affect market price.
Table 2. Profitability and marketing efficiency of timber trade by timber traders in Benue State, Nigeria

<table>
<thead>
<tr>
<th>Zone</th>
<th>Total revenue B (₦)</th>
<th>Exp on timber Flichtches (₦)</th>
<th>Transportation (₦)</th>
<th>Taxes (₦)</th>
<th>Association dues (₦)</th>
<th>Loading/ offloading (₦)</th>
<th>Other costs* (₦)</th>
<th>Total marketing cost C (₦)</th>
<th>Net margin (₦)</th>
<th>Efficiency % (\times 100(%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone A</td>
<td>473,240.00</td>
<td>319,256.00 (82.39)</td>
<td>25,100.00 (6.48)</td>
<td>9,083.33</td>
<td>2,550.00 (0.66)</td>
<td>26,166.66 (6.75)</td>
<td>5,333.33</td>
<td>387,490.00</td>
<td>85,750.00</td>
<td>122.13</td>
</tr>
<tr>
<td>Zone B</td>
<td>1,255,900.00</td>
<td>888,142.20 (94.73)</td>
<td>30,200.00 (3.22)</td>
<td>4,941.12</td>
<td>1,662.62 (0.18)</td>
<td>12,073.83 (1.29)</td>
<td>487,85.00</td>
<td>935,330.00</td>
<td>320,570.00</td>
<td>134.27</td>
</tr>
<tr>
<td>Zone C</td>
<td>1,147,800.00</td>
<td>806,190.00 (92.38)</td>
<td>33,400.00 (3.83)</td>
<td>8,063.83</td>
<td>2,578.72 (0.30)</td>
<td>20,168.08 (2.3)</td>
<td>935,330.00</td>
<td>872,720.00</td>
<td>275,060.00</td>
<td>131.52</td>
</tr>
</tbody>
</table>

NB: (1) Others costs * Miscellaneous (Monetary and material gifts to the village heads, Informants on timber species available in the forests, road expenses).
(2) Values in brackets are components of costs in rows as a proportion of total marketing cost ‘C’. Exchange rate: ₦220 ≡ $1
Source: Computed from field data, 2013

Table 3. Profitability and marketing efficiency of timber trade by chainsaw millers in Benue State

<table>
<thead>
<tr>
<th>Zone</th>
<th>Total revenue B (₦)</th>
<th>Exp on timber (Wood) (₦)</th>
<th>Transportation (₦)</th>
<th>Taxes (₦)</th>
<th>Dues (₦)</th>
<th>Loading/ offloading (₦)</th>
<th>Wages (₦)</th>
<th>Other costs* (₦)</th>
<th>Total marketing cost C (₦)</th>
<th>Net margin (₦)</th>
<th>Efficiency % (\times 100(%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone A</td>
<td>86,828.00</td>
<td>11,963.71 (25.38)</td>
<td>7,979.34 (16.93)</td>
<td>1,554.20</td>
<td>1,915.27</td>
<td>14,303.87 (30.35)</td>
<td>9,069.00</td>
<td>354,07.00</td>
<td>47,140.00</td>
<td>39,688.00</td>
<td>184.19</td>
</tr>
<tr>
<td>Zone B</td>
<td>292,970.00</td>
<td>54,210.70 (33.01)</td>
<td>32,292.00 (19.66)</td>
<td>9,833.30</td>
<td>1,558.30</td>
<td>16,470.90 (10.03)</td>
<td>49,854.00</td>
<td>164,240.00</td>
<td>128,730.00</td>
<td>161.80</td>
<td>179.38</td>
</tr>
<tr>
<td>Zone C</td>
<td>221,170.00</td>
<td>58,738.00 (30.64)</td>
<td>49,440.00 (25.79)</td>
<td>2,020.00</td>
<td>1,582.00</td>
<td>35,418.00 (18.48)</td>
<td>42,372.00</td>
<td>136,690.00</td>
<td>84,480.00</td>
<td>161.80</td>
<td>161.80</td>
</tr>
</tbody>
</table>

NB: (1) *Others Miscellaneous (Monetary and material gifts given to the village heads, Informants on timber species are available in the forests, road expenses, dues).
(2) Values in bracket are components of costs in rows as a proportion of total marketing cost ‘C’. Exchange rate: ₦220 ≡ $1
Source: Computed from field data, 2013
Table 4. Profitability and marketing efficiency of timber trade by Sawmillers in Benue State, Nigeria

<table>
<thead>
<tr>
<th>Zone</th>
<th>Total revenue (₦) B</th>
<th>Exp. on timber (₦)</th>
<th>Transport (₦)</th>
<th>Taxes (₦)</th>
<th>Loading/offloading (₦)</th>
<th>Wages (₦)</th>
<th>Energy bills (₦)</th>
<th>Vehicle maintenance (₦)</th>
<th>Rent (₦)</th>
<th>Other *costs (₦)</th>
<th>Total marketing cost (₦) C</th>
<th>Net margin (₦)</th>
<th>Efficiency ( %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zone A</td>
<td>687370.00</td>
<td>53616 (14.60)</td>
<td>65300.00 (17.78)</td>
<td>29938.00 (7.98)</td>
<td>6071.43 (1.65)</td>
<td>93400.00</td>
<td>6857.14 (1.87)</td>
<td>93700.00 (25.53)</td>
<td>8571.43 (2.66)</td>
<td>9785.72 (2.66)</td>
<td>367240.00 (100.00)</td>
<td>320130.00</td>
<td>187.17</td>
</tr>
<tr>
<td>Zone B</td>
<td>453000.00</td>
<td>46650.00 (14.72)</td>
<td>60000.00 (18.93)</td>
<td>55600.00 (17.35)</td>
<td>23000.00 (7.26)</td>
<td>101000.00</td>
<td>4000.00 (1.26)</td>
<td>22750.00 (7.07)</td>
<td>0.00 (0.00)</td>
<td>4000.00 (1.26)</td>
<td>317000.00 (100.00)</td>
<td>136000.00</td>
<td>142.90</td>
</tr>
<tr>
<td>Zone C</td>
<td>1044500.00</td>
<td>248950.00 (39.90)</td>
<td>121000.00 (18.99)</td>
<td>10080.00 (1.58)</td>
<td>4200.00 (0.66)</td>
<td>47100.00</td>
<td>11500.00 (1.81)</td>
<td>47600.00 (7.46)</td>
<td>73000.00 (12.25)</td>
<td>636930.00 (100.00)</td>
<td>407570.00</td>
<td>284.66</td>
<td></td>
</tr>
</tbody>
</table>

NB: (1) *Other costs Miscellaneous (Monetary and material gifts given to the village heads, Informants on timber species are available in the forests, road expenses, dues).

(2) Values in brackets are components of costs (in rows) as a proportion of total marketing cost ‘C’.

Source: Computed from Field Data, 2013
The low Gini coefficient value of 0.2885 showed that small sawmills were evenly distributed in Benue State and none of the market participants had control on significant proportion of the timber market. Similarly the Gini coefficient of timber traders, chainsaw millers in zone B also revealed that none had significant control since both market actors had their Gini coefficient value within the same range. In the same manner the result of the analysis showed that among the timber traders, chainsaw millers and sawmillers in zone C, none of the market actors also had control of the market except that the value of sawmillers had a relatively higher value. This implies that timber market is monopolistic competitive in structure in the study area. Thus the concentration of sales volume among chainsaw millers was low although higher than the others. This shows that none of the timber market actors controlled significant proportion of the timber trade.

The overall structure of timber market indicates that there are many small-scale dealers such that none could control the market. This type of market structure is competitive, because the individual dealers have little influence on the market price. Tee [9] and Enete et al. [19] made similar observations with *Borassus aethiopum* in North-Eastern Nigeria and charcoal in Abia State Nigeria respectively.

The result on marketing efficiency of timber traders indicates that timber trade in the study area is profitable generating high return on their initial investments. This finding is in conformity with the results obtained by other researchers on marketing margin and efficiency of agricultural and forestry products [20,21]. Thus, Benue state government should develop a policy framework ploughing back some of the profit in developing the timber resource in the state.

4. CONCLUSION AND RECOMMENDATION

The low concentration of timber trade in Benue State shows that distribution of the volume of trade is equitable, and no single market actor controls the timber market. Thus, the market structure tilts towards oligopoly. Timber trade in Benue State is also economically viable, and sawn timber marketing is a profitable and efficient with high financial returns on the initial investment by the marketers.

To ensure the sustainability of timber marketing in Benue State, the study recommends that market actors endeavour to plough back part of their returns into the production of timber resources in the State. Interventions by Government and other stakeholders aimed at encouraging tree planting, effective management, processing and maximum utilization of the timber resources should be a priority. Furthermore, the study recommend further studies on timber market structure measuring fixed costs, assets depreciation values, and opportunity costs to enable the researcher(s) use deconstructed margins in measuring efficiency. The current study did not generate data on pricing mechanism as well as entry and exit requirements in the timber market structure. Further studies should take care of these gaps.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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9