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ANALYSIS OF TIMBER MARKETING IN SELECTED MARKETS IN JOS METROPOLIS, PLATEAU STATE, NIGERIA

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ABSTRACT

This study was carried out to analyze timber marketing in selected markets in Jos metropolis, Plateau State, Nigeria. Respondents were selected through multi-stage sampling technique. Data were collected using structured questionnaire administered to 120 timber marketers in Katako and Building Materials timber markets located in Jos metropolis. Data were subjected to profitability, marketing efficiency, and multiple regression analyses. The findings revealed that timber marketing was profitable in the study area with black plum (*Vitex doniana*) providing the highest monthly gross margin (GM) of ₦99,162.88 which was higher than the monthly GM of each of the other five major timber species, and the mean aggregate GM (₦76, 818.82). Teak (*Tectona grandis*) was the best, having the lowest gross ratio (0.57) and the highest rate of return on investment (0.75). The marketing efficiency of timber was 1.48. The regression analysis revealed that marketing experience, occupation, and labour cost were statistically significant ($p< 0.05$) determinants of timber sales. The study identified irregular timber supply, inadequate market facilities, high cost of energy, inadequate credit facilities, unfavourable government policies, and high transportation costs as challenges to timber marketing. The study recommended among other measures, the need to ensure sustainable supply of timber products from the forest plantations and also the provision credit to timber marketers at low interest rates.

KEYWORDS: Constraints, Gross Margin, Marketing Efficiency, Profitability, Sustainability

INTRODUCTION

Timber is a one of the most important forest products which plays a pivotal role in both local and global economies. Timber products have from time immemorial, played a significant role in satisfying the basic human needs for energy, shelter, transportation, durable and non-durable goods of all types. It is also useful for exterior and interior decorations in homes and industries, production of electric distribution poles, pulpwood, veneers and planks needed in the building and construction industries. Timber accounts for about half of global wood consumption. But these benefits can only be sustained under effective management, conservation and distribution (marketing) of timber as a forest resource. (Olorunnisola, 2023; Babatunde et al., 2020; Agustino et al., 2011).

In Nigeria, the timber industry holds particular significance, contributing to economic growth, employment generation, and environmental management. The economic significance of the timber industry in Plateau State is evident through its contributions to employment, income generation, and revenue for the State government.

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Timber-related activities, including logging, transportation, and timber processing, provide livelihoods for a significant portion of the local population. Additionally, the State government benefits from taxation and permits related to timber trade. Thus, understanding the dynamics of timber marketing within Jos Metropolis is crucial for both local economic development and revenue generation.

Sometimes, the cost of some highly desired timber species are not affordable to some users, which often leads to choice of alternative species, which are often brought from other States of Nigeria. Some timber species found in the timber markets of Plateau State at the time of this study were Khaya senegalensis (mahogany), Triplochiton scleroxylon (obeche), Milicia excelsa (iroko), Prunus avium (cherry), Quercus robur (oak), Betula pendula (birch), Juglans regia (walnut) and Cedrus deodara (cedar), among other available timber species (Adedire et al., 2023).

According to Sambe et al. (2022) and Okeleke (2020), marketing provides a set of tools which people can use to create more efficient economic value for any resource and products made from it. Efficient timber marketing analysis can therefore provide a basis for improving the impact of timber on the economy by making positive contributions to raw material production and supply for construction purposes, furniture making and packaging among others (Sambe et al., 2016).

Although marketing is an avenue which enables people to create efficient economic value for resources and products, research has shown that timber marketing is characterized by inadequate information on marketed species, supply sources and competition nature which has undermined the ability of the sector to contribute optimally to employment and development. In particular, an efficient timber marketing system will provide a means for maximizing products' values and also stimulating equitable distribution of its economic benefits among the different actors in the market (Sambe et al., 2022; Kotler et al., 2007).

The marketing of timber in Jos metropolis, Plateau State, Nigeria, is a complex and dynamic issue influenced by various factors such as demand, supply, pricing, and market structure. To optimize the benefits of the timber industry and ensure its sustainability, a comprehensive marketing analysis is essential. Currently, there is inadequate up-to-date research on the marketing dynamics of timber in Jos metropolis. This necessitated this study which sought to identify the key drivers, challenges, and opportunities within the timber marketing sector to enable informed policy decisions, enhance market efficiency, and promote sustainable timber resource management and livelihoods. In actualizing this, the study was guided by the following specific objectives. To:

i. determine the profitability of timber marketing;

ii. estimate the efficiency of timber marketing;

iii. analyze the factors affecting the sale of timber products;

iv. identify the challenges/constraints of timber marketing in the study area.

METHODOLOGY

The Study Area

The study was carried out in Jos metropolis which covers both Jos North and South Local Government Areas (LGAs) of Plateau State, Nigeria. Jos North Local Government Area has its headquarters in the Jos city centre. It has an area of 300,526km² and a population of 437, 217 people based on the 2006 Census (NPC, 2006) and projected to be 715,530 in 2023 based on a 2.94% growth rate of Plateau State (NPC, 2006) and located between latitude $9^0$56´22"N and longitude $8^0$54´8"E (Plateau State Government [PLSG], 2024). On the other hand, Jos South Local Government Area with its headquarters in Bukuru is located at $9^0$45´18"N and $8^0$50´7"E covering an area of 525,077km^2 with and a population of 311,392 people based on the 2006 Census (NPC, 2006; PLSG, 2024) and projected to be 509,610 in 2023 based on a 2.94% growth rate of Plateau State (NPC, 2006).

Sampling Technique and Sample Size

Multi-stage sampling technique was used in selecting respondents for the study. First, the Katako (or Laranto) timber market and Building Materials timber market in Jos North and Jos South Local Government Areas respectively, being the major timber markets in the metropolis were purposively selected for the study. The sample size was determined using the Yamane (1967) model which is given by:

$$n = \frac{N}{1+Ne^2} \quad \ldots (1)$$

Where, n = sample size
N = Population size
e = margin error (5%).

From a population size of 88 timber marketers (comprising of 32 wholesalers and 56 retailers) from Katako market, and 84 marketers (made up of 22 wholesalers and 62 retailers) from the Building Materials market, a sample size of 79 and 69 respectively were obtained for the two markets. This gave a total sample size of 120 respondents for the study who were selected using the simple random sampling technique.

Data Collection and Analysis

Data were collected through the use of a structured questionnaire to obtain pertinent information on timber marketing from the selected two timber markets. Data gathered covered both socioeconomic characteristics like: age, education, market location, and timber marketing experience.

Marketing data included business operation capital, number of workers, annual income, income level,

expenditures, nature or types of timber marketed and frequency of supplies.

Data were analyzed using the Statistical Software for Social Sciences (SPSS version 22).

Gross margin (GM) analysis

This analytical tool is generally applied where the enterprise fixed costs are very small in comparison to the variable costs. Gross margin represents the difference between the total value of production or total income and the variable cost of production (Zaman et al., 2023; Sambe et al., 2022). The model given by equation (2) was used in this study to analyze timber marketing by the respondents.

The gross margin is computed by formula:

$$GM = GI - TVC \quad \ldots (2)$$

Where; GM = Gross margin

GI = Gross income

TVC = Total variable cost (e.g. cost of timber, transport, rent, tax, levies etc)

The gross margin analysis was applied to achieve Objective (i) of the study.

Gross ratio (GR) analysis

This ratio shows the percentage or proportion of total physical cost that constitutes the gross income. It is the total expenses divided by the gross income (GI), given as by equation (3).

$$GR = GC/GI \text{ or } TVC/GI \quad \ldots (3)$$

Where, GR = Gross revenue

GI= Gross income

GC= Gross cost

TVC = Total variable cost

A less than 1 ratio is desirable for any production business. The lower the ratio the higher the return per Naira invested. The gross cost and gross income in the formula above were applied for the determination of gross ratio (Sambe et al., 2016). This model was also instrumental to achieving objective (i)

Rate of return on investment (RORI)

The Rate of Return on Investment (RORI) indicates the level of profitability of an investment and is an important consideration in the choice of investment. The RORI model adopted by Babatunde et al. (2020) and Sambe et al. (2016) expressed by the following relationship in equation (4) was adopted to also achieve objective (i)

$$RORI = (TR-TC)/TC * 100 \quad \ldots (4)$$

Where, TR= Total revenue

TC = Total cost

Marketing efficiency (ME)

Marketing efficiency was analyzed using the Market efficiency (ME) model used by Babatunde et al., 2020; Ekunwe et al., 2008 given by equation (5) to achieve Objective (ii).

$$ME = (TR/TMC)*100 \quad \ldots (5)$$

Where, ME = Marketing efficiency

TR= Total revenue

TMC = Total marketing cost

Multiple linear regression (MLR)

This tool was used to measure the determinants of timber sales in the two markets which was Objective (iii) of the study. The model for the analysis was the explicit form given by equation (6).

$$Ts = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu \quad \ldots (6)$$

Where, Ts = Timber sales (₦)

β_0 = Constant

β_{1-6} = Coefficient of independent variables (or factors) 1-6

X_1 = Gender of timber seller (1= male; 0 = Female)

X_2 = Education level of seller (years)

X_3 = Experience in timber marketing (years)

X_4 = Secondary occupation [other than timber marketing] (yes=1 or no = 0)

X_5 = Labour cost (₦)

X_6 = Transport cost (₦)

μ = Error term

RESULTS AND DISCUSSION

Profitability of Timber Marketing

Gross margin (GM), gross ratio (GR) and rate of return on investment (RORI)

The monthly gross margin (GM) or profit was obtained by subtracting the total variable costs (comprised of timber, labour, transport, utility, and processing costs) from the gross income (GI) of timber. The highest monthly GM (₦99, 162.88) was from the sale of black plum (*Vitex doniana*). The aggregate monthly mean GM for the timber species in the markets was ₦76, 818.82 (Table 1). But, the sale of teak was better because it had a lower gross ratio (0.57) and a higher rate of return on investment (0.75). This implied that a smaller proportion of the gross income was used to offset variable costs in marketing teak, and that its rate of return was higher (0.75 or 75%) in comparison to other timber species. These findings are at variance with those of Okeleke (2020) who reported Mansonia (*Mansonia altrssina*) as having the highest gross margin in Ibadan town in Nigeria, while Adedire et al. (2023) who found that *Khaya senegalensis* (mahogany) constituted the major timber species most commonly sold in Plateau State.

Table1: Average Monthly Profitability from Timber Sales

Timber Species	GI (₦)	TVC (₦)	GM (₦)	GR	RORI
Iroko (*Milicia excelsa*)	221,377.78	166,007.14	55,370.64	0.75	0.33
White Afara (*Terminalia superba*)	200,800.00	142,463.64	58,336.36	0.71	0.41
Teak (*Tectona grandis*)	198,255.10	113,245.81	85,009.29	0.57	0.75
Black plum or 'Dinya' (*Vitex doniana*)	248,250.00	149,087.12	99,162.88	0.60	0.67
Obeche (*Triplochiton scleroxylon*)	293,450.00	198,848.27	94,601.73	0.68	0.48
African mahogany (*Khaya senegalensis*)	263,683.33	195,251.29	68,432.04	0.74	0.35
Aggregate mean	**237,636.04**	**160,817.21**	**76,818.82**	**0.68**	**0.48**

Note: GI = Gross income; TVC = Total variable costs; GM = Gross margin; GR = Gross ratio; RORI =Rate of return on investment

Source: Field Survey (2024)

Marketing Efficiency

Marketing Efficiency is a measure of market performance. It is the relationship between the prices that consumers pay for the commodity at every stage of the marketing process which reflects the marketing costs (Dagba et al., 2016; Olukosi et al., 2005). This study revealed that (Table 2) the participants were generally efficient because they had a marketing efficiency ratio of 1.48 (or performance of 148%). From the respective timber species, teak marketing was adjudged to be better because it had the highest ratio of 1.75.

Table 2: Marketing Efficiency of Timber

Timber Species	GI (₦)	TVC (₦)	ME
Iroko (*Milicia excelsa*)	221,377.78	166,007.14	1.33
White Afara (*Terminalia superba*)	200,800.00	142,463.64	1.41
Teak (*Tectona grandis*)	198,255.10	113,245.81	1.75
Black plum or 'Dinya' (*Vitex doniana*)	248,250.00	149,087.12	1.67
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Aggregate mean	**237,636.04**	**160,817.21**	**1.48**

Note: GI = Gross income; TVC = Total variable costs; ME = Marketing efficiency

Source: Field Survey (2024)

Factors affecting Sale of Timber Products

This study analyzed six factors and their effects on the volume of sales by marketers of timber in the study area (Table 3). The analysis revealed that 34% of the variability of the timber sales was explained by these factors (as indicated by the adjusted r^2 value of 0.343). Three factors namely timber marketing experience (x_3), occupation (x_4), and labour cost (x_5) were found to be positive and statistically significant at various probability levels. These differed from the findings of Adedire et al. (2023) who found that timber sales were significantly ($p< 0.05$) affected by cost per timber, demand for timber by consumers of wood products, availability of timber products.

Timber marketing experience was an important determinant of timber sales as its effect was found to be positive and statistically significant at 1% probability level (or $p<0.01$). This implied that, a unit increase in timber marketing experience can improve timber sales by the corresponding coefficient (of 0.67%). This is premised on the maxim that every trade has its special characteristics in terms of knowledge and skills requirement which is acquired over time.

The effect of secondary occupation on timber sales was also positive and statistically significant ($p<0.05$). This means that the secondary occupation of timber marketers enhances their sales. This may mean that by virtue of their interactions with people in their other sources of livelihoods, they are able to widen their customer base as well as sales.

Table 3: Determinants of Timber Sales

Factors	Coeff.	Std Error	t-Ratio	p-Value
Constant	0.641	6.564	0.764	0.458
Gender	-0.001	0.001	-0.554	0.588
Education level	0.334	8.128	0.833	0.419
Marketing experience	0.667	7.439	2.769	0.015***
Secondary occupation	0.241	6.816	2.166	0.048**
Labour cost	0.244	8.278	2.342	0.034**
Transport cost	0.034	0.027	1.239	0.236
F-value	2.741***			
R^2	0.540			
R^2-adj.	0.343			

Source: Field Survey (2024)

Challenges of Timber Marketing

Timber marketers faced some challenges (such as irregular timber supply, high transportation cost, and unfavourable government policies) which affect their performance in the marketing system. These challenges affect marketing efficiency, growth and development of the industry.

The most serious of these challenges identified in this study was high transportation cost which was ranked first, followed by inadequate credit facilities, and unfavourable government policies (Figure 1). These challenges were in agreement with some of the findings of Babatunde et al. (2020) and Nwandu et al. (2021) except while the former ranked unfavourable government policies first, the latter found that types of timber specie sold as the highest or topmost constraint.

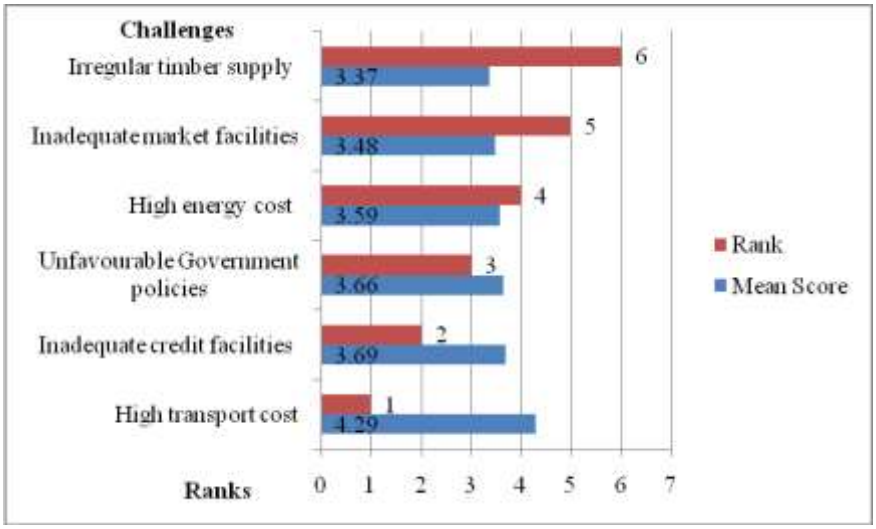

Figure 1: Ranking of Timber Marketing Challenges
Source: Field Survey (2024)

CONCLUSION

Timber marketing plays a very important in the economy of Jos because it provides various timber products which meet varying consumer needs in the construction and furniture industry as well as provide incomes and livelihoods to the marketers and other participants of the marketing system. But the marketing of timber in the study area is hampered by several challenges such as irregular timber supply, inadequate market facilities, high cost of energy, inadequate credit facilities, unfavourable government policies, and high transportation costs which can have negative effects on market profitability and efficiency if not addressed appropriately. The study recommends that marketers should invest more on marketing Teak species which gave the best indices (marketing efficiency and return on investment). Similarly, timber marketers should diversify by having other secondary occupations which widen their business network and clientele. There is need to ensure sustainable supply of timber products from forests plantations in order to prevent shortages which are likely to result in high prices.

The government should encourage the establishment of private and community tree plantation so as to make available more trees towards meeting the increasing demand for timber products. Furthermore, improving the condition of timber markets and their road infrastructure will ease the difficulties in the

market and reduce the cost of transportation. Similarly, improving the synergy between the government and financial institutions through strategic liberal lending policies and conditions can enable timber marketers to access credit easily.

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