

Economic Valuation of Different Wood Species at Plank Market's in Ibadan North Local Government Area of Oyo state, Nigeria

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Abstract

This project was carried out to determine economic valuation of different wood species found at plank market's in Ibadan North Local Government Area (LGA) Oyo state. One hundred questionnaires were administered randomly in the study area. The data was analysed with the use of descriptive statistics, profitability measurement and Pearson chi square. Different wood species available in the plank market were *Terminalia superba*, *Cordia millenii*, *Miliscia excelsa* among others. The result showed that 40% of the plank sellers are between the ages of 41-50 years with the male (62%) constituting the highest number of plank sellers in Ibadan North LGA, 88 % of the respondents source for finance of the business through family, friends and their personal saving. Average Rate of Returns on Investment (RORI) was 477.11 %. The results of Pearson chi-square showed that household size, union membership and number of workers were significant $p < 0.005$. It can be concluded from the study that plank selling is profitable. The size of the logs available in the market was small. It was therefore recommended that the corporate organization and all stakeholders should be more educated on sustainable methods to forestall extinction of the highly valuable products.

Keywords: Economic Valuation; Wood species; Plank Market

Introduction

Towards the tail end of the 19th century, certain hectares of Nigerian forest was put under reservation when it was realized that the rate of forest exploitation as a new enterprise might result into environmental hazard and scarcity of wood in the future (Adekunle *et al.* 2013). Ogunlade (1993) noted that one third of Nigeria land area (983, 213km²) is forest from where just 10% was successfully put under reservation. He further stressed that Nigeria has a total of 1,160 of such constituted forest reserves covering a land area of about 1075km² and most of these reserves only exist today on paper. All

other woodlands apart from the 10% under reservation are regarded as free areas (Adetula, 2008). A total land area of about 914km² is designated as free areas in Nigeria (Adekunle *et al.*, 2013).

Babatola *et al.*, (2012) noted that the sawmilling industry in Nigeria is dominated by small scale and private owned establishments. Sawmills consume the vast majority of the industrial round wood produced in Nigeria and has been estimated to be more than 1300 (ITTO 2013). Babatola *et al.*, (2012) reported that in 2010, the number of sawmills in Nigeria stabilized at 1325. Out of these sawmills that operated in Nigeria in 2010, about 300

were in swamp forests of Lagos and Rivers States which are fed with wood from the adjoining states by rafting or water transportation. About 945 sawmills were in the rain forest zones, most of which are located in Edo, Delta, Ondo, Ogun, Oyo, Osun, Cross River States. In the savannah zone, there are about 80 sawmills located mainly in Taraba, Adamawa, Benue, Kwara, Kogi, Kaduna, and Niger States. The sawmill industry in Nigeria was among the most developed sectors of the nation's economy in the 1960s to the early 1970s contributing about 70% to the country's Gross Domestic Product (GDP). Sawmills were discovered to be a major contributor to rural development in most communities where they exist. The reason for this is that the presence of sawmill also facilitates establishment of small scale enterprises such as furniture industries, timber merchants, local transport, among others (Akachuku, 1998).

Most of the sawmill activities and other forestry activities involves woods and the intensity of these activities exert pressure on the forest reserves, free areas and plantations. However, Vincente (2013) noted that estimated rainforest remaining in Nigeria, are mostly from the "free areas" (53.08%) out of total 1,705,000 ha area of land and are usually sold by traditional communities and other claimants interested loggers for a per-tree fee, roughly equivalent of US\$3-4 per M³ of standing timber. Therefore, forest exploitation had remained a big business to quite a number of people.

According to FAO (1981), the demand for wood, especially fuelwood, has been on the increase and is more than the supply. This may be attributed to the increase in human population and standard of living,

high cost and unavailability of energy and our various levels of economic activities. Owoyemi *et al.*, (2010) wrote that the demand for wood for various purposes has put serious pressure on Nigeria's forest. Some of the uses to which wood is put include timber for building construction, shipbuilding, furniture making, transmission poles, railroad ties, pulp and paper, chemicals and fuelwood. The multi importance of forest resources and population pressure has caused indiscriminate exploitation and scarcity of these resources in Nigeria. Different timber or wood species and sizes have different ways by which they can be utilized. However, this largely depends on the wood-based industry and the desired end uses. According to Fuwape (2000), there were some changes in wood based industries in Nigeria between 1974 and 1997. The total number of wood based industries increased from 358 in 1974 to 1483 in 1990 but decreased to 1373 in 1997. The reduction in the number of wood mills between 1990 and 1997 was attributed to deficit in supply of required wood raw material due to overexploitation of the forest. Different wood based industries such as saw mill industry, particle board industry, fuel wood and charcoal industry and so on, make different demand for wood. According to Tembe *et al.*, (2010), sawmill industry in Nigeria has an estimated capacity of approximately 12.0 million M³ per year in log equivalent, though only 40% of this capacity is actually used.

There is need for knowledge on the various types of species found at sawmill in recent times because timber utilization has shown to be indispensable in human life. Also, it is important to know that there

is a rapid decline in species, size and volume of timber species so that appropriate steps can be put in place by the appropriate authorities. This study therefore sought to know the economic valuation of the plank in the market of Ibadan North L.G.A of Oyo state in terms of marketing, profitability and average Rate of Returns on the Investment (RORI).

Methodology

The study area: The study was conducted in Ibadan North LGA, Oyo state. It's headquarter is in Agodi. It has an area of 27 km² and a population of 306,795 at the 2006 census. Ibadan North Local Government Area is located approximately on longitude 8°5' East of the Greenwich meridian and latitude 7°23' North of the equators. The choice of this local government area was from the fact that over 60% of the small scale processing

industries in this study area deal with timber milling, re-sawing or furniture making or integrated mill activities (Sowunmiet al., 2014).

Data collection: Data was collected with the use of structured questionnaires and oral interview process for those respondents who could neither read nor write. One hundred questionnaires were administered using purposive sampling in the nine zones at eleven respondents per zone for plank sellers within the study area.

Data analysis: Data were analysed with the use of descriptive statistics which includes frequencies and percentages. Also, a budgetary technique was used to measure profitability of the enterprise. The mathematical representation of profits is:

$$\text{Gross Margin (GM)} = \text{TR} - \text{TVC} \text{ ---- (1), Net Profit (NP)} = \text{GM} - \text{TFC} \text{ ----- (2)}$$

$$\text{Rates of Return on Investment (RORI)} = \frac{\text{Net Profit} \times 100}{\text{TC}} \text{ ----- (3),}$$

Where; TC=TVC+TFC, TC = Total Cost, TVC = Total variable Cost, TFC = Total Fixed Cost, TR=Total Revenue. Volume was calculated using the formula $v = \pi d^2 / 4L$ ---- (4)
 Where; V = Volume of logs, d= Diameter (m), L= Length which is constant 12ft (3.66m).

Results and Discussion

Table 1 shows the socio-economic characteristics of the respondents. The result shows that majority (86 %) of the plank sellers are between the ages of (31-40, 41-50, and 51-60 respectively), with 62.0% being males and they constitute the highest number of plank sellers in the study; this means that the trade is done mainly by the men in Ibadan north local government area. This may be attributed to the fact that plank selling business is strenuous and tedious in nature demanding masculine energy. It involves sorting and carrying of planks from one place to another. Furthermore, 77% of the plank sellers had secondary school education while 19% had primary school education. This implies that level of literacy of the respondent is high, which assists in trading activities. The study also showed that Ninety per cent (90 %) of the plank seller in the study area are married with household size majorly between 1-5 (52%). These facts keep 80% of the plank sellers in the business without any other business than plank selling activities as their only source of livelihood. This is in line with Owoyemi *et al.*, (2010) and FAO (1981) who reported that the demand for wood for various purposes has put serious pressure on Nigeria's forest which may be attributed to the increase in human population and standard of living, cost and availability of energy and our various levels of economic activities. Out of the respondents, 98% of the respondents

entered through apprenticeship, 88 % of the respondents did not belong to any Cooperative Societies as 88 % of them source for capital for the business (personal saving (36 %), family (37 %), and friends (15 %)), while 59 % of them did not belongs to any trade union. This implies that most activities engaged by the respondents are sole efforts, in which case if there are other source of funding for the business their income can be boosted.

Table 2 shows the result according to the measurement taken in the field, the species with the largest volume was *Tectona grandis* (0.6M³), followed by *Ficus exasperate species* (0.59 M³) and *Lovoatrichloides* (0.52M³) respectively. This bring low out turn volume of planks, as against the a priori expectation that the higher the out turn volume cubic meter, higher is the out turn of planks expected from the logs. The volumes of logs found in the plank markets nowadays have drastically decreased in sizes compares to a minimum of between 17-20M³ and above that would be carried per load of tipper lorry. Nowadays, tipper lorry carries as much as forty numbers of logs, various species of wood and size to make a full load per trip. This might due to the growing demand for sawn timber in the furniture and building industries which has led to over exploitation, intensive deforestation and over population leading to increase in demand for wood species and few established plantations.

Table 1: Socio-Demographic Information of Respondents in the Study Area

Socio- demographic			Socio-demographic		
Variables N = 100	Frequency	Percentages	Variables N = 100	Frequency	Percentages
Gender			Other Business		
Male	62	62	Yes	12	12
Female	38	38	No	80	80
			NR	8	8
Age			Mode of Business		
21-30	11	11	Inheritance	1	1
31-40	37	37	Apprenticeship	98	98
41-50	40	40	NR	1	1
51-60	9	9			
61-70	1	1	Cooperative Membership		
NR	2	2	Yes	7	7
Level of Education			No	88	88
Primary	19	19	NR	5	5
Secondary	77	77	Membership of Trade Unions		
Tertiary	1	1	Yes	1	1
NR	3	3	No	59	59
Marital Status			S.U	2	2
Married	90	90	NR	38	38
Singles	3	3	Source of Capital for the Business		
Widowed	1	1	Personal saving	32	36
NR	6	6	Family	37	37
Household Size			Friends	15	15
1-5	52	52	Other sources	4	4
6-10	40	40	NR	12	12
11-15	1	1			
NR	7	7			

Source: Field survey, 2015 Key: NR- No Response

Table 2: Average Volume of Logs in the study area

S/N	Wood Species	Average Volume (M ³)
1	<i>Azelia Africana</i> (Apa)	0.48
2	<i>Albizia zygia</i> (Ayinre)	0.49
3	<i>Alstonia boonei</i> (Ahun, Awun)	0.50
4	<i>Antiana Africana</i> (Oro)	0.45
5	<i>Brachylaera luidansli</i> (Eku)	0.36
6	<i>Ceiba pentandra</i> (Araba)	0.42
7	<i>Cedrela odorata</i> (Cedrela)	0.45
8	<i>Cleistopholis potens</i> (Okedo)	0.37
9	<i>Cordia milleni</i> (Omo)	0.45
10	<i>Daniellaoliveri</i> (Ojia)	0.45
11	<i>Entandophragma cylindrium</i> (Ijebo)	0.34
12	<i>Ficus exasperate</i> (Epin), <i>Ficusmucoso</i> (Obobo)	0.59
13	<i>Gmelina arborea</i> (Gmelina)	0.50
14	<i>Khayaivorensis</i> (Oganwo, Mahogany)	0.41
15	<i>Lovoa trichloides</i> (Koko-igbo)	0.52
16	<i>Mansonia altisima</i> (Masonia)	0.36
17	<i>Meliscia excels</i> (Iroko)	0.38
18	<i>Nauclei diderrichi</i> (Opepe)	0.39
19	<i>Parkia biglobosa</i> (Irugba)	0.38
20	<i>Piptaderiastum angolensis</i> (Agboin)	0.51
21	<i>Pycanthus angolensis</i> (Akomu)	0.44
22	<i>Sterculia rhinopetela</i> (Orodo)	0.48
23	<i>Tectona grandis</i> (Teak)	0.60
24	<i>Terminalia ivorensis</i> (Idigbo)	0.47
25	<i>Terminalia superba</i> (Afara)	0.39

Source: Field survey, 2015 NB: Word in () are Local Name of the Wood

Table 3 revealed most available species of tree in the stocks of the respondents in the study area with respect to the price per planks of the wood species respectively, these are; *Terminalia superba*, *Cordia milleni*, *Miliscia excelsa*, *Albizzia coriara*, *Gmelina arborea*, *Triplochiton scleroxylon*, *Guarea cedreta*, *Nauclea diderrichi*, *Ceibalpentandra*, *Khayaivorensis*, and *Tectonagrandis*. This

indicates that more of the tree species harvests in the study are not exotic tree (*Gmelina arborea* and *Tectona grandis*) mainly. It could therefore be inferred that if the indigenous tree species that are frequently harvest in the forest reserves and around the metropolis (free areas) are not properly regulated, it might be posing threat to their sustainability.

Table 3: Most Available Wood species in the Market Covered in the Study Area

Wood Species	Number of Respondent	Average Amount / Plank (N)
<i>Albizzia coriara</i> (Ayunre, Ayinre)	62	1,300.00
<i>Ceiba petandra</i> (Araba)	49	1,000.00
<i>Cordia milleni</i> (Omo)	70	1,500.00
<i>Gmelinaarborea</i> (Gmelina)	64	1,350.00
<i>Guarea cedreta</i> (Olofun)	45	1,300.00
<i>Khaya ivorensis</i> (Oganwo, Mahogany)	42	1,700.00
<i>Miliscia excels</i> (Iroko)	70	1,450.00
<i>Nauclea diderrichi</i> (Opepe)	63	2,100.00
<i>Tectona grandis</i> (Teak)	37	1,750.00
<i>Terminalia superba</i> (Afara)	64	1,500.00
<i>Triplochiton scleroxylon</i> (Arere)	57	1,250.00

Source: Field survey, 2015 NB: Word in parentheses Local Name of the Tree. Figures in Naira arerounded up to the nearest whole Naira.

The results also show (Table 4) that the relationship between household size and profit per load is significant at $p < 0.05$ (0.098). This may be because a man or a woman larger household size will spend more time in taking care of families and have little time for business. Also, there is a significant relationship between profits per load and union membership $p < 0.05$ (0.001). This may be because union members will be contacted to supply the planks when there is a mega request to meet up with. While, significant relationship between profits per load and the numbers of workers $p < 0.05$ (0.000) may be because

the higher the worker the more wages to be paid at the end of the day and vice versa.

The result in table 5 revealed that the average net profit of the mostly occurring species in the area is N516,283.30 (Opepe) followed by Teak having N388,195.50 net return, Araba (N224,868.10) and Arere (N276,561.78) being the lowest. The average rate of return on investment for the enterprise value of 477.11 % means that for every N1.00 invested in the business returns a net profit of N477.11 to the business and this implies that the plank selling business is highly profitable.

Table 4: Chi-Square Analysis Result

Variables	Value	Df	Sig.
Profit Per Load * Location	46.114 ^a	48	0.550 NS
Profit Per Load * Sex	3.858 ^a	6	0.696 NS
Profit Per Load * Household Size	18.611 ^a	12	0.098*
Profit Per Load * Age	146.471 ^a	144	.427NS
Profit Per Load * Marital Status	4.603 ^a	12	.970NS
Profit Per Load * Union Membership	29.749 ^a	10	.001*
Profit Per Load * No. of Workers	76.385 ^a	36	.000*

Source: Field survey, 2015NS – Not significant at 5% ($p < 0.05$) level,

* - Significant at 5% ($p < 0.05$) level

Table 5: Average Costs and Return Analysis of Common Plank Species Marketin the Study Area

Wood Specie	Variable Cost			Total Variable Cost(N)	Total Fixed Cost(N)	Total Cost(N)	Revenue(N)	Gross Margin(N)	Net Profit(N)	RORI %		
	Cost of Logs	Labour Cost	Electricity Permit/Tax Transport									
Afara	16,190.40	11,648	2,861.67	3,388.35	36,988.64	71,077.06	877.24	71,954.30	394,029.9	322,952.84	322,075.60	447.61
Omo	13,914.4	11,648	2,861.67	3,388.35	36,988.64	68,801.06	877.24	69,678.30	416,549.0	347,747.90	346,870.66	497.82
Iroko	12,184.6	11,648	2,861.67	3,388.35	36,988.64	67,071.26	877.24	67,948.50	387,347.4	320,276.14	319,398.90	470.06
Ayunre	11,306.4	11,648	2,861.67	3,388.35	36,988.64	66,193.06	877.24	67,070.30	345,815.4	279,622.34	278,745.10	415.60
Gmelina	12,265.6	11,648	2,861.67	3,388.35	36,988.64	67,152.26	877.24	68,029.50	357,539.4	290,387.14	289,509.90	425.57
Aere	10,736.8	11,648	2,861.67	3,388.35	36,988.64	65,623.46	877.24	66,500.70	343,062.5	277,439.02	276,561.78	415.88
Obobo	11,155.6	11,648	2,861.67	3,388.35	36,988.64	66,042.26	877.24	66,919.50	351,528.2	285,485.96	284,608.72	425.30
Opepe	18,063.4	11,648	2,861.67	3,388.35	36,988.64	72,950.06	877.24	73,827.30	590,110.6	517,160.54	516,283.30	699.31
Araba	8,836.8	11,648	2,861.67	3,388.35	36,988.64	63,723.46	877.24	64,600.70	289,468.8	225,745.34	224,868.10	348.08
Mahogany	16,190.4	11,648	2,861.67	3,388.35	36,988.64	71,077.06	877.24	71,954.30	445,063.2	373,986.16	373,108.92	518.54
Teak	14,540.6	11,648	2,861.67	3,388.35	36,988.64	69,427.26	877.24	70,304.50	458,500.0	389,072.74	388,195.50	552.16
Mean												
Total	13,216.82	11,648	2,861.67	3,388.35	36,988.64	68,103.48	877.24	68,980.72	398,092.2	329,988.74	329,111.50	477.11

Source: Field survey, 2015 Keys: RORI- Rate of Return on Investment (%).

Conclusion and Recommendations

Conclusion: The study has proved that the value realized from the selling of planks is highly profitable. The volume of logs found in plank market nowadays are decreasing in size which is due to the growing demand for sawn timber in the furniture and building industries, and the tree found are of economic value.

Recommendations: Based on the findings, the study recommends that government should make stiffer law and empower the existing forestry department and agencies to combat the menace of deforestation and discourage harvesting of under size tree. Stakeholders should be educated on sustainable methods of harvesting to forestall extinction of the highly valuable products. Effort should also be made towards regular supply of power (electricity) as this will reduce their variable cost of log production. Afforestation and reforestation exercise should be encouraged especially with species that are highly endangered (indigenous species). The trade union as whole, individual members and corporate organization can be encouraged.

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