



ECONOMIC ANALYSIS OF MAJOR WOOD SPECIES SOLD IN PLANK MARKETS IN ALIMOSHO LOCAL GOVERNMENT AREA, LAGOS STATE, NIGERIA

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ABSTRACT

*This study examined the economics analysis of the major wood species sold in plank markets in Alimosho Local Government Area, Lagos, Nigeria. Multi stage sampling technique was used to select 120 respondents and it involves the selection of Alimosho Local Government Area, Random selection of twelve (12) plank markets and simple random sampling technique was used in selecting respondents in the plank markets. Data were analyzed using descriptive and budgetary analytical tools. The results showed that majority of the respondents were males (90%) and between the age of 35 to 44 (39.2%). Majority were married (90%) and mostly Yoruba (95%). Large percentage (71.7%) had secondary education and were Muslims (60.8%). Majority (98.3%) were fulltime plank marketers and 98.3% secured their business through apprenticeship while capital was mostly by means of personal savings. Most of the plank markets were over 30 years and they were all privately owned. Wood species in the study area includes mahogany (*Khaya ivorensis*), iroko (*Milicia excelsa*) *Gmelina* (*Gmelina aborea*), Teak (*Tectona grandis*), Araba (*Ceiba pentandra*), Ayunre (*Albizia zygia*), Obi (*Cola spp*) among other Rate of Return on Investment (RORI) recorded for plank size 2x6 inches for all wood species was more than other plank sizes. The Benefit Cost Ratio (BCR) greater than 1 (BCR>1), indicating that the enterprisewas profitable. It is recommended that only trees that have attained merchantable height and girth should be felled for conversion.*

Keywords: Plank marketers, wood species, sawmilling, timber, profitability

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INTRODUCTION

Forest has played a major part in the growth of human development compared to any other resources. Wood that is used as timber, fuelwood, pulp and paper is the most precious and marketable product obtained from most forests (Adedokun et al.,2017). Nigeria's total forest

plantation is estimated at 269,000 hectares. They consist of roughly 109,377 hectares of *Gmelina aborea* planted for supplying pulpwood to the pulp and paper industries of the nation and 159,623 hectares of other species mainly for industrial wood production. The other species include *Tectona grandis*, *Terminalia ivorensis*,

Nuclea diderichii, *Triplochiton scleroxylon*, *Eucalyptus spp*, *Pinus spp*, and others of the meliaceae family (*Khaya spp*). All these plantations were often created at the cost of natural forests in forest reserves (National Forests Policy, 2006).

It is frequently argued that wood is the world's most multipurpose raw material. Wood was the most widely used material for building and energy generation until the last half of the 19th century. Nigeria-based wood sector involves wood logging, sawmilling or sawn wood processing, wood-based panel products (plywood, fiberboard and particle board), furnishings, pulp and paper sectors, among others (Owoyemi 2016). Sawn wood and sawmilling are an important forest product and industry in Nigeria. Sawn wood serves as the raw material for the wood-based industry and is produced and marketed locally across the country in plank markets and sawmills. Sawn wood processing and marketing contributes to a sustainable livelihood in both rural and urban parts of Nigeria through employment and cash income. (Ohwo *et al.*, 2014). According to the FAO, (1999) sawnwood is the most produced and demanded among other semi-processed and processed wood categories and is the most distributed for construction purposes in Nigeria. Most sawmill industries are situated in the country's wood-producing rainforest regions, in which the western states are among. The largest number of sawmills are found in Lagos, Ekiti, Osun, Cross River, Ondo, Oyo, Imo, Edo, Delta and Ogun States. Together, they represented over 90 percent of the country's saw milling operations. (Bello *et al.*, 2010).

Nigeria's sawmill industry is a significant sector because it is profitable. The industry is an avenue to increase the nation's revenue with the potential of providing jobs and enhancing hundreds and thousands of individuals with income generation. This sector is also expected to continue to develop as the saw milling /wood-based panel industry has many potentials for industrialization (Adedokun *et al.*, 2017). Adedokun *et al.*, (2017) asserted that the highest profit recorded in Abeokuta North LGA could be due to increase in demand of planks for construction in the study

area and nearness to urban area (i.e. Lagos). It is therefore necessary to examine the major wood species in the plank markets, their profitability and the challenges facing the marketers in an urban area such as Lagos to ascertain the situation of the study area. Therefore, this study was to investigate the economic analysis of major wood species found in plank markets in Alimosho LGA, Lagos State, Nigeria.

MATERIALS AND METHODS

Study Area

Lagos State is located in the southwestern geopolitical zone of Nigeria. It is arguably the most economically important state in the country, containing Lagos city, the nation's largest urban area. The city is the most populous in Nigeria and in Africa. It is one of the fastest growing cities in the world and one of the most populous urban areas. Lagos is the major financial centre in Africa, it has the fourth highest GDP in Africa and houses one of the largest and busiest seaports on the continent (Wikipedia, 2018). Alimosho, which is located at coordinates 6°36'38"N and 3°17'45"E. Alimosho, is a LGA in the Ikeja division of Lagos State. It is the largest LGA the State with a total land mass of 13,187 km² and a total population of 1,817,200 inhabitants. It is bounded by two local government areas which are Ikeja and Agege LGA (alimosho.lg.gov.ng)

Sampling Procedure and Sampling size

Reconnaissance survey was carried out to determine the level of availability of respondents in Alimosho LGA Lagos State. Multi stage sampling technique was used for the study. Random selection was used to select twelve (12) plank markets in the study area and simple random sampling technique was used in selecting 10 respondents in each plank market making a total number of 120 respondents in all.

Data analysis

Descriptive statistical tools such as mean, frequency and percentage distribution were used to analyze the socioeconomic characteristics that exist among the respondents. Budgetary tool of Cost and Benefit analysis was used to determine the degree of profitability of plank marketing in the study area.

Cost and Return analysis

Gross revenue (GR) = Total output * unit price [1]

Gross profit (GP) = GR- VC [2]

Net profit (NP) =GP-FC [3]

Rate of return (ROR) = $\frac{TR*100}{TC}$ [4]

Rate of return on investment (RORI) = $\frac{Profit*100}{TC}$ [5]

Profitability index (P1) GP/ GR [6]

Profit = TR – TC [7]

Where;

TR = Total revenue

IC = Total cost

TVC = Total variable cost

TFC = Total fixed cost

RESULTS

Socio-Economic Characteristics of the Respondents

The sex of respondents revealed that majority of the plank marketers are male (90%) and the rest are female (10%). Out of the 120 copies of questionnaires that were administered, 108 are male and 12 are females. This showed that the business is male dominated. Result on age showed that the highest percentage belongs to the age range of 35 to 44 (39.2%), followed by age range from 45 and above (38.3%), then age range 25 to 34 (16.7%), followed by 18 to 24 (5.0%) and then age range less than 18 (0.8%). The marital status showed that 90% are married, that is majority of the respondents are married, 7.5% are single, 0.8% are divorced and 1.7% are classed as others (that is widows, widowers).

The result showed that a larger percentage of the respondents (50%) had family size ranging between 2 and 4 individuals, followed by 5 to 7 (41.7%), then 8 to 10 individuals by 7.5% and lastly is the family size of 11 individuals and above having 0.8%. the ethnic group revealed that 95% of the respondents are Yoruba, followed by others (i.e. Igede, Urhobo, Edo and other tribes except Yoruba, Igbo and Hausa) and having 3.3% and lastly Igbo having 1.7% of the respondents.

The result on the educational level showed that majority of the respondents went to secondary school (71.7%) i.e. 71.7% of the respondents have secondary education, followed by primary education (15.8%), also 10% of the respondents have tertiary education and just few with 2.5% have no formal education. Furthermore, the largest percentage of the respondents is Muslims with 60.8% and the rest are Christians having 39.2% of the total respondents. Majority of the respondents got the job through apprenticeship having 93.8% and the others inherited the job having 1.7% of the respondents. Also, larger percentage of the respondents has been in the business for about 21 years and above (35%), followed by 11 to 15 years which is 21.7%, followed by 6 to 10 years which is 18.3%, 16 to 20 years which is 15% and lastly 1 to 5 years which is 10%. In addition, most of the respondents (95%) got their capital from personal savings, 4.2% from both personal savings and bank loans and just 0.8% got it from only bank loan.

Table 1: Socio-economic analysis of plank marketers in Alimosho Local Government Area, Lagos State.

Variables	Frequency	Percent
Gender		
Male	108	90
Female	12	10
Age		
<18	1	0.8
18-24	6	5.0
25-34	20	16.7
35-44	47	39.2
45 and above	46	38.3
Marital status		
Married	108	90
Single	9	7.5
Divorced	1	0.8
Others	2	1.7
Family Size		
2 – 4	60	50
5-7	50	41.7
8-10	9	7.5
11 and above	1	0.8
Ethnic Group		
Yoruba	114	95
Igbo	2	1.7
Others	4	3.3
Level of Education		
No formal education	3	2.5
Primary	19	15.8
Secondary	86	71.7
Tertiary	12	10
Religion		
Christianity	47	39.2
Islam	73	60.8
Mode of Occupation Acquisition		
Inheritance	2	1.7
Apprentice	118	98.3
Duration in the business		
1-5 years	12	10
6-10years	22	18.3
11-15years	26	21.7
16-20years	18	15
21 years and above	42	35
Are you a full-time plank marketer?		
Yes	116	96.7
No	4	3.3
Source of capital for the business		
Personal savings	114	95
Bank loans	1	0.8
Both	5	4.2
Total	120	100

Characteristics of respondents involved in the marketing of planks in the Study area

This study shows that majority of the plank markets have been existing for more than 30 years having 58.3% and the other 41.7% have been existing for about 21 to 30 years and that all plank markets are privately owned. Also, all the plank markets are having band saw, circular saw, planer machine and saw doctor and they all acquire their stocks directly from the forest; 84.2% of the respondents acquire their lumber from government forests and the other 15.8% gets

their lumber from both private and government forests. Based on the type of marketer, 83.3% of the respondent's markets both in wholesale and retail and the other 16.7% markets their good only as retailers. The means of transportation revealed that 75.8% of the respondents transport their goods by means of self-owned vehicles and the other 24.2% by hired vehicles. Among the challenges facing the marketers include- cost of transportation being the major problem, power failure and scarcity of timber.

Table 2: Characteristics of respondents involved in the marketing of plank Alimosho Local Government Area, Lagos State.

Variables	Frequency	Percent	Mode
Age of Plank market (years)			
21-30	50	41.7	>30
> 30	70	58.3	
Ownership			
Private	120	100.0	Private
Type of machine in each sawmill			
Band saw, circular saw, saw doctor, plainer machine	120	100	
Source of log			
Government forest	100	84.2	Govt. forest
Private and Govt. forest	20	15.8	
Mode of stock supply			
Direct from forest	120	100.0	Direct from forest
Type of marketer			
Retailer	20	16.7	
Wholesaler and Retailer	100	83.3	Wholesaler and retailer
Means of transporting products			
Owned vehicle	91	75.8	
Hired vehicle	29	24.2	Owned vehicle
Challenges facing the enterprise			
Power failure	31	25.83	
Cost of transportation	62	51.66	Cost of transportation
Scarcity of timber	27	22.51	
Total	120	100.0	

Average Cost and Return Analysis of a Truck Load of Major Wood Species in Alimosho Local Government Area, Lagos.

Araba (2x6 inches) had the highest RORI which indicates that it was the most lucrative of all wood species and dimensions in the study area. This may be as a result of high demand of Araba which can be influenced by consumer taste and preference. Gmelina and Teak (2x4 inches) had the lowest RORI; this indicates that they were the least profitable of all species and dimensions in

plank markets in Alimosho local government area. Benefit-cost ratio for all species and dimensions had values greater than 1 (BCR > 1). Araba (2x6 inches) had the highest BCR (1.69), implying that for every ₦100 invested in production of Araba (2x6 inches), there will be a return of ₦169.

TABLE 3: Summary of the average cost and return analysis of a truck load of major wood species in Alimosho Local Government, Lagos State.

Wood species	Size of sawn wood(inches)	TFC (₦)	TVC (₦)	TC (₦)	TR (₦)	GP (₦)	ROR (₦)	ROR I(₦)	BCR (₦)	PI (₦)
<i>Khaya ivorensis</i> (Mahogany)	2 x 12	3,225	1,236,400	1,239,625	1,440,000	203,600	116.16	16.16	1.16	0.14
	2 x 6	21,225	1,236,400	1,257,625	1,680,000	443,600	133.59	33.59	1.34	0.26
	2 x 4	39,225	1,236,400	1,275,625	1,440,000	203,600	112.89	12.89	1.13	0.14
<i>Milicia excelsa</i> (Iroko)	2 x 12	3,225	1,236,400	1,239,625	1,440,000	203,600	116.16	16.16	1.16	0.14
	2 x 6	21,225	1,236,400	1,257,625	1,680,000	443,600	133.59	33.59	1.34	0.26
	2 x 4	39,225	1,236,400	1,275,625	1,440,000	203,600	112.89	12.89	1.13	0.14
<i>Gmelina arborea</i> (Gmelina)	2 x 12	3,225	1,236,400	1,239,225	1,350,000	113,600	108.94	8.94	1.09	0.08
	2 x 6	21,225	1,236,400	1,257,225	1,620,000	383,600	128.86	28.86	1.29	0.24
	2 x 4	39,225	1,236,400	1,275,225	1,350,000	113,600	105.86	5.86	1.06	0.08
<i>Tectona grandis</i> (Teak)	2 x 12	3,225	1,236,400	1,239,225	1,350,000	113,600	108.94	8.94	1.09	0.08
	2 x 6	21,225	1,236,400	1,257,225	1,620,000	383,600	128.86	28.86	1.31	0.24
	2 x 4	39,225	1,236,400	1,275,225	1,350,000	113,600	105.86	5.86	1.06	0.08
<i>Ceiba pentandra</i> (Araba)	2 x 12	3,225	936,400	936,625	1,260,000	323,600	134.53	34.53	1.35	0.27
	2 x 6	21,225	936,400	957,625	1,620,000	683,600	169.17	69.17	1.69	0.42
	2 x 4	39,225	936,400	975,625	1,350,000	413,600	138.37	38.37	1.38	0.31
<i>Albizia zygia</i> (Ayunre)	2 x 12	3,225	876,400	879,625	1,170,000	293,600	133.01	33.01	1.33	0.25
	2 x 6	21,225	876,400	897,625	1,140,000	263,600	127.00	27.00	1.27	0.23
	2 x 4	39,225	876,400	915,625	1,170,000	293,600	127.78	27.78	1.28	0.25
<i>Sacoglottis gabonensis</i> (Itara)	2 x 12	3,225	756,400	759,625	1,140,000	383,600	150.07	50.07	1.50	0.34
	2 x 6	21,225	756,400	777,625	1,200,000	443,600	154.32	54.32	1.54	0.37
	2 x 4	39,225	756,400	795,625	1,170,000	413,600	147.05	47.05	1.47	0.35
<i>Cleistopholis spp</i> (Okedo)	2 x 12	3,225	756,400	759,625	1,140,000	383,600	150.07	50.07	1.50	0.34
	2 x 6	21,225	756,400	777,625	1,200,000	443,600	154.32	54.32	1.54	0.37
	2 x 4	39,225	756,400	795,625	1,170,000	413,600	147.05	47.05	1.47	0.35
<i>Cola spp</i> (Obi)	2 x 12	3,225	936,400	936,625	1,140,000	203,600	121.71	21.71	1.22	0.18
	2 x 6	21,225	936,400	957,625	1,200,000	263,600	125.31	25.31	1.25	0.22
	2 x 4	39,225	936,400	975,625	1,170,000	233,600	119.92	19.92	1.20	0.20

TFC: Total Fixed Cost; GP: Gross Profit; TVC: Total Variable Cost; ROR: Rate of Return; TC: Total Cost RORI: Rate of Return on Investment TR: Total Revenue; BCR: Benefit-Cost Ratio; NP: Net Profit; PI: Profitability Index

Table 4: Major wood species and their uses in Alimosho Local Government, Lagos State.

Common name	Botanical name	Uses
Mahogany	<i>Khaya ivorensis</i>	Used for furniture, interior and exterior joinery and veneer
Iroko	<i>Milicia excelsa</i>	Used for furniture, construction, joinery, paneling, floors and boats
Gmelina	<i>Gmelina arborea</i>	Used for furniture, construction, carriage, musical instruments
Teak	<i>Tectona grandis</i>	Used for furniture, boat building, exterior construction, veneering and carvings
Araba	<i>Ceiba pentandra</i>	Used for spatula making, mortar, doors, furniture, canoe, craft work and musical instruments
Ayunre	<i>Albizia zygia</i>	Used for indoor constructions, light flooring, furniture, veneering and plywood
Itara	<i>Sacoglottis gabonesis</i>	Used for canoe making, house and bridge construction, cabinet works and railway sleepers
Obi	<i>Cola spp</i>	Used for building materials, farming, hunting and fishing instruments, carvings and musical instrument
Okedo	<i>Cleistopholis spp</i>	Used for joinery, door frames, roof-beams and furniture.

DISCUSSION

From the study, majority of the respondents were male with few females which were 10% only. This may be ascribed to the fact that plank selling business is strenuous and tedious in nature and requires physical strength. The much difference between the occurrence of male and female may be because of the energy required for sorting, carrying and arrangement of planks. This finding corroborates with the assertion of Sekumade and Oluwatayo, (2011) that in Nigerian economy, most capital intensive and difficult jobs tends to be dominated by male. Majority of the respondents lie between the age class of 35 to 44 which was 39.2%, the age range of 45 and above was 38.3%, age range of 25 to 34 was 16.7%, 18 to 24 was 5% and age range less than 18 was just 0.8%. This study showed that majority of the respondents were in their active and prime age in term of marketing efficiency, it therefore agrees with Kassali, *et al.*, (2015) who reported that individuals in their early fifties and below falls in their active age in terms of marketing efficiency and risk taking in businesses.

Majority (i.e. 90%) of the respondents that were involved in marketing of planks in the study area were married and this agrees with the findings of Taphone (2009) who reported that married people have more responsibility in taking care of their family members hence are always making efforts to involve in business that will increase their

financial ability. This may be the reason why the enterprise is being dominated by married people so as to meet with family responsibilities. 0.8% of the respondents had a household of 11 individuals and above, 7.5% had 8 to 10, 41.7% had 5 to 7 and 50% had household of 2 to 4 individuals. This implies that timber business is profitable enough to take care of a large household as well as a smaller one. High family size may lead to more mouth to feed, therefore reducing the ability to save money and the family members may also be used as free labour as recorded by Alfred and Akintade, (2002), thereby reducing amount spent on hired labour. Sekumade and Oluwatayo (2011) asserted that wood-based enterprises have contributed to the economy of Nigeria. The plank marketing enterprise can therefore be described as an enterprise that serves as important means of meeting family needs.

Majority of the respondents attained secondary education (71.7%), while 15.8% attained primary education, 10% had tertiary education and 2.5% had no formal education. This study therefore contradicts earlier study of Adedokunet *al.*, (2017) on economic analysis of different wood species in sawmills in Abeokuta, Ogun state where majority of sellers were illiterates. This study confirms the findings of Oladele *et al.*, (2013) who asserted that educational status contributes to skill acquisition and book keeping positively in small scale business. This study

therefore indicates that there could be easiness in adopting modern technology in processing.

This study also revealed that 35% of the respondents had about 21 years of experience and above, 15% had 16 to 20 years of experience, 21.7% had 11 to 15 years of experience, 18.3% had 6 to 10 years of experience and 10% had 1 to 5 years of experience in plank marketing. It was opined by Adedokun *et al.*, (2017) that years of experience is one of the factors that determines profitability and it also helps in having good negotiation. Most of the respondents were full-time plank marketers and the other 3.3% had another job in support with plank marketing. This indicated that plank marketing is an enterprise that can provide full-time employment to the people. It was also discovered that most of the plank markets has been in existence for over 30 years. This indicates that the enterprise has been in existence for a long time in the study area. It was observed that private ownership of plank markets in the study area was 100%; this indicates that they are all owned privately with no support from the government.

The study also showed that majority of the plank markets were large market and they all have band saw, circular saw, planer machine and saw doctor. They all acquire stocks directly from the forest and majorities were obtained from government forest reserves. A larger percentage of the plank marketers sell both in wholesale and retail. A large percentage also claimed that transportation was by owned vehicles. This affects the price of products as the use of hired vehicle increases cost of timber and eventually increase the price of products. (Alfred and Akintade, 2002). According to Adedokun *et al.*, (2017), the problem of cost of transportation which was claimed by 51.66% of the respondents may be as a result of increase in cost of fuel, bad road networks and cost of maintaining vehicles. Scarcity of timber may be as a result of inadequate availability of sawnwood which is a problem that can be ascribed to sawnwood production from the point of felling to the last stage of selling. (Adedokun *et al.*, 2017). Power failure poses a great challenge to the enterprise. Respondents claimed to rely on other sources of

power such as diesel generator and this may lead to increase in cost of production and consequently sales prices of end products.

The higher the rate of return on capital, the better the business. (Larinde and Olasupo, 2011). Araba (2x6) had the highest RORI which indicates that it was the most lucrative of all wood species and dimensions in the study area. This may be as a result of high demand of Araba which can be influenced by consumer taste and preference. Gmelina and Teak (2x4) had the lowest RORI; this indicates that they were the least profitable of all species and dimensions in plank markets in Alimosho local government area. Benefit-cost ratio for all species and dimensions had values greater than 1. ($BCR > 1$). This indicates that the plank market enterprise can be termed as profitable in the study area. This conclusion was based on Adegeye and Dittoh (1985) which says investment criteria requires that BCR should be greater than one ($BCR > 1$) before it can be termed profitable. Araba (2x6) had the highest BCR (1.69), implying that for every ₦100 invested in production of Araba (2x6), there will be a return of ₦169. This study is therefore in line with the report of Larinde and Olasupo (2011) which stated that the wood enterprise is very profitable as an average wood marketer would be able to make better return from an investment in short period of time.

CONCLUSION

This study revealed that plank marketing enterprise is a very profitable business in Alimosho LGA, Lagos State as all species and dimensions had BCR greater than 1. It shows that the gains from plank sales can help meet basic needs and contributes positively to the socio-economic statuses of plank marketers in the study area. Plank size 2x6 inches of all species is more profitable than other sizes, except for Ayunre of which plank size 2x12 inches had more profitability than 2x6 inches. Common timber species such as *Milicia excelsa* (iroko) and *Ceiba pentandra* (araba) were becoming scarce at the time of this research as a result of excessive logging and over-exploitation and this has led to increase in purchasing prices of such species.

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