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Economic Profitability of Marketing Fuel Wood in Ibadan Town of Oyo State, Nigeria

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ABSTRACT

Fuel wood is a major forest product that serves as vital source of livelihood for large proportion of the poor and middle- class people living in or close to the forest in most tropical countries. This study carried out the economic profitability of marketing fuel wood in Ibadan town of Oyo State, Nigeria. It specifically examines the market structure and conduct for fuel wood, the profitability and type of fuel wood sellers in the study areas. A multi-stage sampling technique was used to select 50 fuel wood marketers in the study area and structured questionnaires were administered on them. Descriptive statistical tools such as frequency, percentage and table; profitability analysis, gross margin and Gini coefficient were used to analyze the data collected. The study revealed that fuel wood market is dominated by the retailers which accounted for 46% of the sellers though there were other categories of sellers such as wood fellers/ producers (16%), wholesalers (32%) and wholesalers/ retailers (6%). The profitability analysis showed that an average marketer incurred a total variable cost of ₦31, 731.82 per week but earned average revenue of ₦38,290.00 per week which implies that an average marketer earned ₦ 6,558.18 as gross margin per week. In the analysis, the marketing margin and efficiency of fuel wood were estimated to be 58.69% and 120.67% respectively. A Gini-Coefficient of 0.393 obtained in this study indicates a high level of concentration and inefficiency in the fuel wood market. It is therefore recommended that the marketers should be equipped with incentives such as means of transportation, forest subsidies inform of reduce tax, reduced forest-charges, credits and loans that will reduce the marketing cost and bring about equal distribution of sales and income.

1. Introduction

Fuel wood is the dominant source of energy for cooking, heating and other energy generating activities. It was estimated that rural populace generate 73% of their cooking energy from wood, 11% from Kerosene, 9% from wood-imposed store and 7% from other means while the urban populace generate 52% of their cooking energy from Kerosene, 21% from wood, 12% from wood-imposed store and 15% from other means (World Bank, 1996). Larinde and Olasupo (2011) reported that Non-timber forest products (NTFP) are a vital source of livelihood for large proportion of the poor living in or close to the forest in most tropical countries. Food and Agricultural Organization (FAO) (1990) claimed that fuel wood which is a major forest product is commonly used for domestic and industrial generation of energy while wood harvesting for fuel is the third most important economic activity for the inhabitants of forest dependent areas followed by farming and animal rearing respectively.

In most developed nations, trees are not always used in its raw form but processed into either paper products or timber with little reliance on wood for energy generation but in most developing worlds, the reverse is usually the case as they often used wood as their primary source of energy for most households and industrial activities. Hence, the use of fuel wood keep increasing globally as the world population escalates with between 3% and 4% annual growth in demand since majority of the world population are found in these developing countries (Oronsaye, 2003). Nash and Cecilia (2006) explained that increase in the cost of fossil fuel and other sources of energy triggered the use of fire wood which commenced in the seventies. They also found that about 2000 million people depended on fuel wood and other biomass fuel in 1981 while more than 100 million were unable to meet the minimum requirement.

Fuel wood marketing can be measured in order to determine its efficiency in terms of marketing structure and performance, marketing margins, and efficiency. Giron *et al.*, (2010) defined market structure as certain characteristics of the market which are believed to influence its nature of competition and price formation. Adegeye and Ditton, (1985) further emphasized the characteristics to include size and number of buyers and sellers, ensuring an adequate intensity of price and quality competition, freedom of entry and exit and adequate size of sellers so as to encourage increased in investment. It is therefore germane that market structure, conduct and performance of a marketing system be well examined before concluding that a market is either good or not. The assessment of how well the marketing process is carried out and how successfully its goals are accomplished is seen as market performance.

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Giroh et al., (2010) included that market performance is also concerned with the technological progressiveness, growth orientation of firms, and efficiency of resource use and product improvement with maximum market services at the least possible cost.

Marketing efficiency is the movement of products/ goods from producers to consumers at the lowest cost with the provision of services desired by the consumer. Ejiola, (2001). Market is said to be efficient when the ratio of output value to that of input value throughout the marketing system is maximized. The higher the ratio, the better the marketing efficiency (Arene,1998). Olukosi et al., (2005) explained marketing margin as the difference in price of a given commodity as it moves from the primary producers to the ultimate consumers while Adegeye and Dittoh (1985) stated that market margin is the representation of the difference in price paid to the first seller and that paid by the buyers.

Gini-coefficient of zero express perfect equality (G=0) where all the respondents have equal value (income) while that of unity (G=1.00 or 100) expresses perfect inequality where one person has all the income (Gini, 1909). A low Gini coefficient indicates a more equal distribution, with 0 corresponding to complete equality while higher Gini-coefficients indicates more unequal distribution with 1 corresponding to complete inequality.

Today, large numbers of rural and urban dwellers are involving more in marketing of fuel wood and it is common to see them by the road sides especially near a major market. Hence, it is necessary to focus on the income generating ability of fuel wood which is one of the major forest products and also examine its market structure so that potential investors could have an idea of the business before venturing into it. The objective of this study is to examine the structure, conduct and profitability/performance of fuel wood in Oyo State.

2. Methodology

2.1. Study Area.

The study was carried out in Ibadan, Oyo state which is one of the major states in southwestern Nigeria and because active felling of trees, wholesale and retail selling of fuel wood takes place there. Multi stage, purposive and random sampling producers were used for the study. Stage one was the purposive selection of Oyo state due to the presence of active fuel wood markets. Stage two was the selection of local government areas with high fuel wood marketers which are Ibadan North Local Government, Ibadan North East Local Government, Akinyele Local Government, Ibadan south Local Government and Egbeda Local Government. The third stage was the random sampling of ten (10) fuel wood marketers from each of the local governments. Primary data was used for the study and the data was obtained using structured questionnaires administered to a total of 50 respondents in the selected five local government areas. Data were collected on the marketers' gross income, cost of acquisition, transportation, storage and so on.

2.2.Analytical Techniques

Data collected were analyzed using budgeting technique, marketing margin analysis and Gini Coefficient to determine the extent of the sellers concentration and hence, the nature of competition as in Giroh et al.,(2010)

Gross margin (G.M) = G I – TVC ……..(1)

Where G M = Gross margin

G I = Gross Income

T V C = Total Variable Cost

Gini Coefficient is expressed mathematically as

G C = 1 - ∑XY (Iheanacho, 2005; Giroh et al., 2010)

Where:

G C = Gini Coefficient

X = Proportion of sellers

Y = Cumulative proportion of sellers

The value of Gini Coefficient varies from 0 to 1. The higher the coefficient, the higher the concentration level and hence, high inefficiency in the market structure and vice versa.

M M = (FP – CP)/ CP …… (4)

Where

M M = Market margin

F P = Farm gate price (The amount wholesalers bought fuel wood from the producers at the farm gate. i.e producers selling price)

C P = Consumers price (the amount consumers finally bought it from the retailers or wholesalers)

Marketing Efficiency (ME) was estimated using Shepherd-Futrel model which stated that

$$M E = \frac{TR}{TC} \times 100 \quad \ldots\ldots (5)$$

Where;

TR = Total Revenue from sales

T C = Total Cost. Since TFC = 0. Therefore TC=TVC

Shepherd-Futrel model of accurate measurement of efficiency gives the productivity of resources invested in the marketing process in quantitative terms either by the total value of products sold divided by computing the total estimated cost incurred by marketing agency and producers combined and expressed as a percentage or alternatively, the coefficient of marketing efficiency can be expressed as the difference between the total sales revenue and total cost divided by the total cost incurred. (Giroh et al., 2010; Arene, 1998)

3.0.Results and interpretation.

3.1. It was observed from table 1 that none of the respondents were less than 30 years old and 12 % were between 31 and 40 years while 44% were between 41 and 50 years. Moreover, 44% were greater than 50 years old. This revealed that fuel wood market in the study area is a business for the adults both in their mid and late years. It therefore serves as a business which the aged can fall back on when they are no more capable of jumping up and down for survival. At the same time, it accommodates adults in their mid years that are still active and able to go to the forest and bushes in felling and collecting the wood; and also in bringing the wood out to cities, towns and villages. These groups of adults are usually found at the producer/ feller levels while the aged occupies the retailers' level.

It was observed that none of the fuel wood marketer used for the study was less than 30 years because most young ones are not yet aware of the profitability of the business but consider white collar job as the ultimate. This support Afolabi (2009) stated that this age distribution can have positive as well as negative impacts on the business aggressiveness of the marketers. It was also observed from the study that 86% of fuel wood marketers were females while only 14% were male. This therefore shows that fuel wood market is a business for both male and females. Though the business is a rigorous business which is supposed to be dominated by the male gender but recent development in the business has made a clear way for the female gender to make wave in the business. It was found from the study that the male gender handled the rigorous part; as they are the ones that go to the forest, identify the trees that are ready for harvest, fell them, cut them into

Table 1. Socio-economic characteristics of respondents.

Socio-economic characteristics			
Age in years	Frequency	Percentage	cumulative Percentage
< 20	0	0	0
20-30	0	0	0
31-40	6	12	12
41-50	22	44	56
<50	22	44	100
Total	56	100	
Gender			
Male	7	14	14
Female	43	86	100
Total	50	100	
Marital Status			
Singles	1	2	2
Married	15	30	32
Divorced	10	20	52
Widow/widower	24	48	100
Total	50	100	
Educational Status			
No Formal Education	19	38	38
Primary Education	22	44	88
Secondary Education	8	16	92
Tertiary	1	2	100
Total	50	100	
Tribe			
Yoruba	48	96	96
Hausa	0	0	96
Ibo	2	4	100
Total	50	100	
Marketing Experience in years			
1-5	14	28	28
6-10	11	22	80
11-20	18	36	86
>20	7	14	100
Total	50	100	

Source: Field survey, 2012

desired sizes, packed, tight and load them into the vehicles while the females transported them to the markets for sales and distribution.

The study also revealed that majority of the marketers (48%) were widows, 30% were married, 20% were divorced and only 2% were singles. This therefore suggests that marketing fuel wood plays a vital role in family sustainability especially at grassroots' level. As observed from the study, 68% of single parent depends on the business as their major source of livelihood. Having only 2% of the singles that engaged in the business revealed that there is dearth of awareness on the prospects of marketing fuel wood among the single folks who contributes largest percentage of the unemployed in Nigeria.

This support (Ndaghu et al.,2011,) who reported that non timber forest tree resources (NTFTR) have important contribution to the wellbeing of the rural poor. They further declared that NTFTRs such as fuel wood, locust beans e.t.c provides food, sources of income and raw material for cottage industries that have supplied life sustaining strategies in the communities. It also confirmed Latiff et al., (2002) who reported that 80 % of the people living in extreme poverty depend on forest resources such as fuel woods as their source of livelihood.

The study also showed that 38% of fuel wood marketers had no formal education, 44% had primary education, 16% had secondary education and just 2% had tertiary education. This suggests that education level of the marketers is extremely low and might have adverse effects on the efficiency, profitability as well as adoption of innovations by the marketers. This agree with Oluwasola (2010) who declared in his study that low level of education among respondents can have serious implications on their ability to access information, use new technological innovations and even access or procure credits from formal financial information. The study revealed that 98% of the markers were Yoruba which may be due to the fact that Yoruba tribe dominates the study areas. This supports Sekunmade and Oluwatayo, (2011) who claimed that the location of most forest resources has great influence on the group of people that engage in its business.

28% of the marketers were found to have between 1 to 5 years of business experience. 22% had between 6 to 10 years, 36 % had 11 to 20 years while 14% had more than 20 years of business experience. This finding shows that marketing/ business experience is an important factor to consider in the business. It is thus not a business that anybody can just venture into without adequate experience of the business. This supports the statement of Adeoye et al., (2011) which states that the higher the numbers of years a marketer engage in a particular business, the better he become in the business.

3.2.Category of sellers in the study area.

The results in table 2 showed that 16% of the marketers were producers/ fellers. 32% were wholesalers, 46% were retailers

and 6% serves as both wholesalers and retailers concurrently. This hence indicates that retailers dominate fuel wood market though the wholesalers have better opportunities to make higher returns from their market. This finding supports Afolabi (2009) which stated that retailers usually dominate marketing of agricultural products which may be due to the small capital investment required to start the business at retail level.

Table 2. Category of sellers in the study area.

Types of sellers	Frequency	Percentage Frequency	Cumulative Percentage
Wood feller/ Producers	8	16	16
Wholesalers	16	32	48
Retailers	23	46	94
Wholesaler/ Retailers	3	6	100
Total	50	100	

Source: Field survey, 2012

3.3.Market Conduct for Fuel wood in the Study Area

The result in table 3 revealed that majority of the marketers (68%) used open display method to attract consumers. 18% used persuasive method, 10% used discount price while 4% used selling of quality products as a way of attracting customers. These findings agree with Larinde and Olasupo, (2011) which states that fuel wood has ready buyers as large number of prepared food vendors such as restaurants, vendors of barbecue (Suya) and party outfit served at celebrations, and bakeries are regular customers of fuel wood sellers. Hence, fuel wood sellers need no special advertisement except few entrants who are new in the business and/or in the marketing areas and are trying to create awareness to establish their presence in the areas. Table 3 also revealed that 80% of the marketers agreed that there are differences in the fuel woods types/ species sold in the market while 20% declined. The difference was found to be solely on the species of trees from which the fuel wood was derived. The tree species are forest -local trees, Myelin and the thick trees. All the marketers responded that consumers taste and preferences are paramount to sales and thus they always ensure to have the three species so as to maximize the business opportunity. Also in table 3, most of the marketers (96%) claimed to belong to fuel wood association and (88%) emphasized that nobody can successfully engage in the business without being a member of the association. These show that, there is high involvement in the association which may be due to the fact that the business has been in existence for long period of time. It also revealed that fuel wood market is a highly organized business which no one can just engage in without due process. This contradicts Ndaghu et al., (2011) who discovered that there was little involvement in fuel wood member association. The reason for that result was because of the differences in the study areas. Fuel wood market has been in existence for long period of time and the marketers had been able to organize and structure out many things over the years. This was revealed from the business experience of the marketers as most marketers have11-20 years of the business experience.

The result in table 3 also revealed that cost of fuel wood acquisition (68%) is the major determinant of fuel wood price/ bundle size per time. Though the price might not actually change throughout the market but the bundle size will definitely reduce or increase based on the cost of acquisition per time. Moreover, fuel wood market also obeys the law of demand and supply as forces of demand and supply (16%) were discovered to influence the price and bundle size per time. The bargaining ability of buyers (10%) as well as quality of products (6%) also plays vital roles in shaping the price and bundle size of fuel wood per time. The ability of customers to haggle well in price indicates that there is price discrimination. This supports Afolabi (2004)

Table 3. Market Conduct of fuel wood in the Area.

Market Structure	Frequency	Percentage	Cumulative Percent
Method of attracting customer			
Open Display	34	68	68
Persuasive method	9	18	86
Quality Products	2	4	90
Discounted Price	5	10	100
Total	50	100	
Difference in Products/ Fuel woods			
Yes	40	80	80
No	10	20	100
Total	50	100	
Existence of fuel wood Association			
Yes	48	96	96
No	2	4	100
Total	50	100	
Membership of fuel wood Association			
Yes	48	96	96
No	2	4	100
Total	50	100	
Can new entrants do without joining the Association?			
Yes	6	12	12
No	44	88	100
Total	50	100	
Factors determining price of fuel wood			
Forces of demand and supply	8	16	16
Cost of acquisition of fuel wood	34	68	84
Consumers bargaining ability	5	10	94
Quality of fuel wood	3	6	100
Total	50	100	

Source: Field survey, 2012

Income Sales (₦)	Number of sellers (frequency)	Proportion of sellers (X)	Cumulative frequency	Cumulative proportion of sellers	Total sales (₦)	Proportion of sales	Cumulative proportion of total sales (Y)	XY
< 20,000	18	0.18	18	0.18	212,200	0.022	0.022	0.004
20,001-40,000	20	0.20	38	0.38	600,400	0.063	0.085	0.017
40,000-60,000	8	0.08	46	0.46	390,800	0.041	0.126	0.010
60,001-80,000	12	0.12	58	0.58	883,200	0.093	0.219	0.026
80,001-100,000	9	0.90	67	0.67	792,000	0.083	0.302	0.272
100,001-120,000	2	0.02	69	0.69	1,120,400	0.118	0.420	0.008
120,001-140,000	4	0.06	73	0.73	1,488,000	0.157	0.577	0.0346
140,001-180,000	10	0.10	83	0.83	768,000	0.081	0.658	0.0658
>180,000	17	0.17	100	1.00	3,245,000	0.342	1.00	0.17
Total	100	1.00			9,500,000	1.00		0.607

Mean value of sales = ₦ 95,000.00

Gini coefficient = 1-∑XY

= 1-0.607 = 0.393

3.4.Constraints in marketing fuel wood

It was discovered from the study that transportation is the number one constraint in marketing fuel wood. The result in table 4 showed that 30% of the marketers complained that there is poor road network linking major sources of fuel wood zones to the markets and as a result, marketers find it difficult to convey their goods to the markets. Similarly, there were no stand- by vehicles navigating the fuel wood source-zones and the few available ones were expensive to use. This hence leads to increase in marketing cost and majority of them could not afford it. This supports Latiff et al., (2002) who declared transportation as a major challenge to agriculture in Nigeria. The result also revealed that season of the year is another constraint to profitability of marketing fuel wood. 28 percent of the marketers agreed that fuel wood market is highly seasonal. It was discovered that fuel wood commands high price in wet season compared to dry season because fuel wood is not always available in wet season due to the in-accessibility of most forests and park lands in wet season. Most vehicles do break down on the way. Moreover, the fuel woods from the forest in wet season are always wet and unsuitable for immediate use. The marketers that have sheds or store house(s) to keep the fuel wood that are obtained in dry season are usually the 'king' as they monopolize the market in wet season.

Instability in government policy as well as government insincerity in implementing the policy is another major constraint to fuel wood markets. It was discovered from the result that instability in government policy as well as government insincerity in implementing the policies prevents the marketers from accurately predicting and effectively preparing for the business activities. Government incessant closing down of forests, park lands and games reserves also prevents the marketers from obtaining the best from the business. Furthermore, most forest guards will not perform their duty effectively unless the marketers give them extra money. It was also found that the capital set up for the business was enormous for average Nigerian based on the recent economic situation of the country while market fluctuation was the least constraint to marketing fuel wood.

Table 4. Constraints in marketing fuel wood

Constraints	Number of respondents	Percentage of respondents	Cumulative Percentage
Transportation	15	30	30
Season	14	28	58
Government Policy	12	24	82
Capital set up	8	16	98
Market fluctuation	1	2	100
Total	50	100	

Source: Field survey, 2012

3.5.Profitability Analysis.

The result in table 5 revealed that acquisition cost accounted for 72.74% of the total sales revenue while cost of transportation accounted for 5.49% of the total sales revenue. The cost of labor gulped 2.01% while cost of storage accounted for 1.83% of the total sales revenue.

The table also showed that acquisition cost accounted for 87.78% of the total variable cost while transportation accounted for 6.63% of the total variable cost. The cost of labour gulped 2.43 % of the total variable cost while the storage cost accounted for 2.21% of the total variable cost.

Table 5. Cost and returns of respondents.

Items	Amount (₦)	% of TVC	% of Total Sales
Acquisition cost	1,392,618.40	87.78	72.74
Transportation cost	105,265.89	6.63	5.49
Storage cost	35,000.15	2.21	1.83
Cost of labour	38,506.79	2.43	2.01
Miscellaneous cost	15,200.00	0.96	0.79
Total Variable Cost(TVC)	1,586,591.00	100.00	82.86
Total Revenue (TR)	1,914,500.00		
Total Variable Cost/ Seller	31,731.82		
Total Revenue/ Seller	38,290.00		
Gross Margin/ Seller	6,558.18		
Marketing Margin (%)	58.69		
Marketing efficiency (%)	120.67		
Benefit Cost Ratio (TR/ TVC)	1.21		
Gini-Coefficient	0.393		

Source: Field Survey, 2012

The low storage cost among the respondents may be due to the fact that most of them especially the retailers sell their fuel wood in open spaces, along the road and in front of their houses or pay for parts of another person's shop. This agree with the findings of Afolabi (2009) which states that most retailers prefer to sell their products in an open spaces along the road and thus pay less storage cost. The table also revealed that an average marketer incurred a total variable cost of ₦31731.82 per week but earned average revenue of ₦38290.00 per week. This implies that an average marketer earned ₦ 6558.18 as gross margin per week. The marketing margin was 58.69% and the marketing efficiency was 120.67%. This suggests that fuel wood marketing is a profitable venture in the study area. The Benefit- Cost ratio was 1.21. This implies that for every ₦100 invested in the business, there is a return of ₦21.00. This shows that the business is a profitable venture. This agrees with Larinde and Olasupo, (2011) which stated that fuel wood trade is very profitable as average fuel wood marketer is able to recoup his or her investment with better returns in short period of time. A Gini-Coefficient of 0.393 obtained in this study indicates a high level of concentration in the fuel wood market and hence a high inefficiency in the market structure.

4.0. Conclusion and Recommendation.

The study revealed that fuel wood market is dominated by the retailers which accounted for 46% of the sellers though there was other categories of sellers such as trees fellers/producers (16%), wholesalers (32%), and wholesalers/retailers which accounted for (6%) of the marketers. The profitability analysis showed that an average marketer incurred a total variable cost of ₦31,731.82 per week but earned average revenue of ₦38,290.00 per week. This implies that an average marketer earned ₦ 6,558.18 as gross margin per week. The marketing margin and efficiency of fuel wood are 58.69% and 120.67% respectively. A Gini-Coefficient of 0.393 obtained in this study indicates a high level of concentration in the fuel wood market and hence a high inefficiency in the market structure. Analysis of the market conduct revealed that factors such as cost of acquisition, ability to bargain, demand and supply and quality of fuel wood determined the prices set by the marketers.

Without any iota of doubt, it can be concluded that fuel wood marketing can serve as one of the veritable business to reduce poverty and unemployment in the study area.

It is therefore recommended that the marketers especially the wholesalers should be equipped with incentives such as means of transportation, credits and loans *e.t.c* that will reduce the marketing stress and cause equal distribution of incomes/ sales.

Transportation, season and government policy are the major marketing constraints of fuel wood. It is therefore recommended that government should provide good transportation incentives such as good road networks, sound vehicles, and so on that will make the business easy for fuel wood marketers. Moreover, government needs to review their forest policy based on the condition of the present market conditions so that much people can benefit from the income generating opportunities that fuel wood offers.

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