

PROFITABILITY ANALYSIS OF FUEL WOOD MARKETING IN YEW A NORTH LOCAL GOVERNMENT AREA OF OCUN STATE

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Abstract

This research work was undertaken to analyze/e the economic profitability of fuelwood marketers in Yewa North Local Government Area of Ogun State. A total of one hundred and twenty (120) structured questionnaires were administered by personal contact on the fuel wood marketers in selected villages. Descriptive, marketing margins and regression analysis were used to analyze the data collected. The result of the descriptive analysis revealed that female was mostly found in fuelwood business as compared to their male counterparts. The result also shows dial many of the marketers have formal education while only few (31.7%) were illiterates. Profitability (Budgetary) analysis was carried out to determine the profitability level of fuel wood products in the study area. The fuelwood marketers were divided into two categories, viz. firewood marketers and charcoal marketers and profitability analysis was carried out for each category. The result of the analysis showed that profitability level depends on the number of loads of fuelwood per month, giving the net income per respondent for the two categories of fuelwood marketers. Budgetary analysis was used to estimate the total cost, total revenue and the gross margin. Regression analysis revealed that cost of hired and distance of fuelwood have negative impact on demand correlates of fuel wood. The study further revealed the problems faced by the fuel wood marketers such as theft, lack of technical assistance or information, incessant hike in price, credit size, poor patronage, unauthorized tax collection and bad road during raining season. It is therefore recommended that the government and private individuals should give priority to fuelwood in alleviating and combating the problems for smooth and better performance.

Introduction

Fuelwood plays a major role in supplying energy to the rural masses and the poorest groups in the towns. Fuelwood occupies a special place in rural energy systems owing to the importance of the domestic consumption for which it is mainly used and the fact that it is produced within the system itself. This reflects the extent of the demand for warmth in the traditional rural energy system as compared with that of propulsive energy. Wood is the fuel customarily preferred by rural people both because its decentralized method of production is suited to the scattered nature of rural habitation and usually makes it possible to obtain the fuel without added cost, and because production can be maintained on the basis of sustained yield and in combination with other goods and services. Fuelwood is thus pre-eminently a renewable source of energy whose decentralized nature is particularly suited to the characteristics of rural energy systems. In a rural community, the energy system reflects an integrated structure of relationships between resources and activities, and the role of fuel wood must be seen as a complex function with many connections with the land tenure and land use systems, agricultural practices, the machinery for allocating resources, social structures, e.t.c. (Hoister, 1993; NSOT, 2000)

Domestic requirements of fuelwood are essentially used for cooking food and heating the homes. These usually account for the biggest percentage of overall energy consumption in developing countries. This is even more marked for rural populations and poor households. Fuelwood is usually the fuel preferred by rural people, who have very little access to other forms of energy. Wood therefore, plays an essential role in meeting elementary energy requirement connected with the very subsistence of these people.

— In addition to its renewal and decentralized nature, fuel wood can be gathered and used by simple techniques because there is no much resources to expend on modern equipment and is therefore, particularly suited to the requirements and possibilities of its users. Minimum energy requirement for cooking and heating may be estimated at 6 - 10 GJ, or. 0.5 m - 1m³ of fuelwood per person per year. Under present conditions, considerable variations are possible according to cooking habit, climate, way of life and social structure, and also the efficiency of the cooking equipment. (Maserra and Nava, 1996). If account is taken of the amount of heating necessary in cold mountain climate, total energy requirement for domestic purpose may reach 25 - 30 GJ, the

equivalent of about 3m of wood, per person per year. Seasonal climatic variations, the nature of the wood and its availability may considerably modify effective consumption levels. (World Resource Institute, 1996; VanderPlas, 1995).

The contribution of fuelwood as a source of energy is not limited to rural energy systems or to subsistence sectors. In many countries, urban areas account for an increasing share of fuel wood consumption, owing to both the migration of country people who conserve a rural way of life, and to the dependence of the poorest families, who continue to rely on wood for their needs. Fuelwood then often tends to be replaced by its derivative, charcoal, which is easy to transport, store and use, but the production of which entails considerable loss of the energy contained in the raw material. In the absence of control, urban demand signifies a concentration of consumption leading not only to localized over - cutting of resources around the town, but also to diversion to the town of supplies indispensable for the people living in rural areas. The effects are felt for more than 100km around the town, and the distance is constantly increasing. Urban demand for fuelwood, therefore, may also constitute an important factor in disrupting rural energy supplies. (Karekezy, 2002).

In emphasizing on the importance of fuelwood in rural energy system, attention must be drawn to the role played by this fuel in meeting such essential energy needs as cooking, heating and rural industries in the developing countries. Its growing scarcity is making it more difficult for a great many people to subsist and is breaking up their energy system. In extreme cases, it is upsetting the balance of the environment as a result of deforestation and the cutting of all woody vegetation. The problem of fuelwood, thus, has three important dimensions: forestry, energy and environment. That is why its role in the rural energy systems must be clearly perceived as a problem not only of subsistence but also of development (Filipinnl and Pachauri, 2004).

With the recent economic situation on the marketing and consumption of fuelwood in the study area, it will be interesting to ask and find answers to questions like, What are factor(s) affecting the demand of fuelwood?, What are the problems faced by the fuelwood marketer? What are the economic effects of fuelwood marketing in the study area? What are the cost return and revenue structure of fuelwood marketing? An attempt to critically examine the questions with the aim of providing answers to them, in relation to economic analysis of fuelwood marketing ensue the objectives of this study. The study set to analyze the marketing of fuelwood and examine cost and return structure of fuelwood.

Methodology

Study Area and Method of Data Collection

The area of study is the Yewa North Local Government Area of Ogun State. Primary data were sourced and used for this research work. The required information was obtained through structured questionnaires administered personally on the target fuelwood marketers.

Sampling Techniques

Multistage sampling technique was employed in this study. Out of the eleven (11) political wards in Yewa North Local Government Area, 6 were randomly selected and 20 fuelwood marketers were randomly selected from each political ward, making up a total of 120 respondents.

Methods of Data Analysis

Both descriptive and inferential statistics were employed in the analysis of the data. The socio-economic characteristics of fuelwood marketers were analyzed using descriptive statistics such as frequency table and percentage. Inferential statistics were used in estimating marketing margin of fuelwood retailers and budgetary analysis for the profitability of fuelwood marketers. Marketing margin is the difference between the price paid by the consumer and price paid by the retailer as a percentage of the price paid at the retail end by the consumer (Kohls, 1985).

Mathematically,

$$\text{Marketing margin (mm)} = \frac{PC - Pr}{Pr} \times 100$$

PC Where: PC =

price paid by the consumer

Pr = price paid by the retailer

This was estimated for all categories of fuelwood marketers and the result was compared to determine the consumers' profitability. Budgetary analysis was used to determine the profitability of the fuelwood in the study area. Specifically,

$$CM = TR - TVC \tag{ii}$$

$$N! = CM - TFC \tag{iii}$$

$$\text{Profitability index or ratio on sales (PI) NI/TR} \quad - \quad - \quad - \tag{iv}$$

The rate of return on investment (%) $RRI = NI/TC \times 100$

(v)

(vi)

Operating ratio = TVC/TR

Where,

- GM = Gross Margin
- TVC = Total Variable Cost
- PI = Profitability Index
- TC = Total Cost
- TR = Total Revenue
- NI = Net Income
- TFC = Total Fixed Cost
- RRI = Rate of Return On Investment
- RRVC = Rate of Return on Variable Cost

The T - statistics was used to test whether the obtained ratio was statistically different from one (I) or not.

The hypothesis as thus, H_0 :

UP = 1

UC

Ha: UP + 1 UC

H_0 : Null hypothesis

Ha: Alternative hypothesis

We failed to reject H_0 , if tabulated value was not significantly different from one; and if otherwise, we have rejected H_0 .

Multiple Regressions Model

The regression model of the form below was specified:

$Y = f(X_1, X_2, \dots, X_6)$

(xi).

$Y = a_0 + \sum_{i=1}^n b_i X_i + U_i$

Where Y = Dependent variable

X_i = Independent variables

a_0 and b_i are the parameters that were estimated

a_0 = Intercept parameter

b_i = Slope parameter/coefficient of X_j

U_i = Error term

$D = a_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + \dots + b_6 X_6 + U_6(x)$

Where: D = Quantity of fuelwood marketed by marketers (kg)

X_i = factors that determined the quantity of fuelwood marketed by marketers (kg) Where, X_1 - year of experience (years)

X_2 - fuelwood types (firewood, charcoal etc)

X_j = marketing cost (\$4)

X_4 — mode of supply (wholesale, retail, sub-retail, consumer) X_5
= education status (primary, secondary, tertiary) X_6 = sex of the
marketers (male - 0; female - 1) U_j = error term

Results and Discussion

Table 1: Socio-Economic Characteristics of the Respondents

Variables	Frequency	Percentage
Age		
<30	6	5.0
31-40	22	18.3
41-50	36	30.0
51-60	35	29.2
>60	21	17.5
Sex		
Male	40	33.3
Female	80	66.7
Marital Status		
Single	5	4.2
Married	65	54.2
Divorced	20	16.7
Widow	21	17.5
Separated	9	7.5
Educational Level		
No formal schooling	38	31.7
Primary education	48	40.0
Secondary education	21	17.5
Tertiary education	13	10.8
Household Size		
1-5	45	37.5
6-10	71	59.2
11-15	4	3.3
Religion		
Christian	64	53.3
Islam	47	39.2
Traditional	9	7.5
Years of Experience		
1-5	54	45.0
6-10	40	33.3
11-15	18	15.0
16-20	6	5.0
Above 20	2	1.7
Occupation		
Marketers	19	15.8
Trading	37	30.8
Artisan	33	27.5
Fanning	21	17.5
Transporter	1	0.8
Paid servant	9	7.5
Member of Association		
Yes	106	88.3
No	14	11.7
Labour Source		
Family labour	15	12.5

Hired labour	41	34.2
Self labour	28	
Family and hired labour	36	30.0
Source of Capital		
Cooperative loan	56	46.7
Gifts from friend & relatives	18	15.0
Personal saving	46	38.3
Fuelwood type		
Fire wood	45	37.5
Charcoal	75	62.5
Buyers		
Marketers	1	0.8
Consumers	76	63.3
Retailers	43	35.8
Standard Measurement		
Yes	76	63.3
No	44	36.7
Unit of Measurement		
Otherwise	43	35.8
Bag	77	64.2
Total	120	100.00

Source: Field Survey, 2008

Table 1 shows the distribution of fuelwood marketers by age. From the survey findings, the minimum age range is less than 30, while the maximum age range is greater than 60. The result shows vividly that majority of the fuelwood marketers are in their active age, that is, between age of 41-50years. The sex distribution of the respondents shows that 33.3 percent were male head of household while 66.7 percent were female heads. This result conforms to the prevailing situation of the study area where most households are headed by females. The distribution of respondents by marital status of household heads showed that majority (54.2 percent) are married, which implies that the respondents have family responsibility. The bulk of the fuelwood marketers 40.0 percent have primary education, this implies that there is an appreciable level of literacy among the respondents. 75 percent of the surveyed household heads have more than 6 persons; this has consequence on household welfare and standard of living.

Most of the respondents (53.3 percent) practised Christianity showing that the household heads are highly religious and dedicated to their beliefs. Some of the fuelwood marketers 45.0 percent have less than 5 years experience, indicating that many of the respondents are green horns in the business. 30.8 percent of the household heads engaged in trading and 17.5 percent are involved in farming. This reinforces the important role of fuelwood in the Nigerian economy.

The distribution of household heads on the basis of association showed that 88.3 percent of the household heads belong to an association of fuelwood marketers. The implication of this finding is that there is a greater population of the respondents in the marketing association, which was to promote economic links among members' towns and villages. The results indicate that 34.2 percent involved in hired labour. This means that the labour source used was hired and this provides job opportunities for such categories of people. Some of the respondents have access to loan as 46.7 percent of the household heads received cooperative loan, which helped them during financial crisis. The distribution of major fuelwood products by the fuelwood marketers revealed that 62.5 percent fuelwood types are charcoal. The result indicates that majority of the respondents involved in charcoal marketing as a result of high demand and as a substitute to kerosene.

The buyers of the fuelwood products from the respondents are made up of 63.3 percent consumers and 35.8 percent retailers. This confirms that the buyers are mainly the consumers. The unit measurement of the product of the respondents showed that 64.2 percent used bags as their measurements especially fuelwood (charcoal) marketers.

Table 2: Distribution of Respondents by Problems Encountered

Problems	Frequency	Percentage
Theft	15	12.5
Lack of technical assistance or information	13	10.9
Incessant hike in price	30	25.0
Credit size	57	47.5
Other	5	4.2
Total	120	100.0

Source: Field Survey, 2008.

Table 2 shows the number of problems encountered by the fuelwood marketers. Five percent of respondents have theft as a problem, 10.9 percent have lack of technical assistance or information, 25.0 percent have incessant hike in price, 47.5 percent credit size while 4.2 percent of the respondents encountered other problems such as: poor patronage, unauthorized tax collectors and bad road network especially during the rainy season. The implication of this is that except few of them (i.e. marketers) who have access to cooperative loan, many of them are still operating below their business capacity due to inaccessibility to loan from banks.

Cost and Return Structure of Fuelwood Marketing

Table 3: Budgetary Analysis for Fuelwood Marketers

Items	Mean amount (N)	
Total	128240.02	
Revenue		18.47
Variable Cost	1661.0833	62.69
Transportation cost	5635.7916	2.48
Cost of labour	223.4205	83.67
Cost of carriage	7520.2954	
Total variable cost	120,719.72	16.33
Gross Margin	56841.936	100.0
Marketing margin	1468.5946	
Fixed cost (Dep. Valve)	8988.89	
Total Cost (TVC + TFC)	119,251.13	
Net income	0.8988	
Profitability Index % (NI/TR)	1326.6502	
RRI = (NI/TCx 100)	1685.7	
RRVC (%) TR-TFC x 100		
TVC	0.0114	
OR = TVC/TR	91.31	
Value of fuel wood used at home	44018.250	
Total value of product		

Source: Field Survey, 2008

Table 3 shows that the numbers of fuelwood marketers that were into fuelwood marketing alone were one hundred and twenty (120). The total cost for an average fuelwood marketer is N8,988.89, while the gross margin is N120,719.72. From the table also, other profitability indices were calculated and it revealed that fuelwood marketing alone is very profitable. The profitability index is NO.8988, which is an index that attempts to identify the relationship between the net income and

total revenue of a proposed project through the use of a ratio.

Also, the Rate of Return on Investment (RRI), Rate of Return on Variable Cost (RRVC), Operating Ratio (OR) are NI,326.6502, N1685.7 and N0.0114 respectively.

Factors Influencing the Demand of Fuelwood

This is to identify the factors that militate against the demand of fuelwood in the study area. The results are shown in Table 4.

Table 4: Factors Influencing the Demand Correlates of Fuelwood

Variables	Parameters	Regression Coefficient(B)	T-value
Constant	B ₀	-45175.342	-1.251
Distance of fuelwood	X ₁	-458.596	-0.553
Value of last season	X ₂	0.435***	4.640
Cost of hired labour		-0.579	-0.826
Family labour	X ₄	2679.852	0.660
Educational level		7995.782***	1.700
Household size	X ₆	115.633	0.061
Experience Amount	X ₇	3815.614*** 0	2.980
borrowed		795***	3.702
Age	X ₉	353.269	0.781
Source of initial capital	X ₁₁	11350.811***	1.603
Sex Annual Income	X ₁₂	21.665***	0.789
		0.635***	1.240
Adjusted R ² F	63.5		
- value	288.54*		

*** = Significant at 1%, ** = Significant at 5%, * = Significant at 10%

Source: Field Survey, 2008

The variability in Y (dependent variable) can be explained by the independent variables (x_i) up to 63.5 percent. The sign of the coefficient reveals the relationship between dependent and independent variable(s) and it shows that an increase in family labour used by the fuelwood marketer will increase the income by 2679.85tons/bag. Moreso, the farther fuelwood is to the marketing destination, the lesser the quantity purchased. The result reveals that a naira increase in amount borrowed increases the output by 0.795tons/bag. In addition, as business experience increases (i.e. age spent in business), so the income increases by 3815.614tons/bag. Appreciable variables tested have significant impact on the fuelwood marketers income in the study area. The source of initial capital a has significant impact on the marketers' income, and thus shows that sources of initial capital of the marketers is the major determinant of the level of income, there will be an appreciable increase in the level of income the following season. From the result, most of the variables tested significantly and determine the level of fuelwood income by the marketers.

Conclusion and Recommendations

This study was to identify the problems of fuelwood marketing, examine the cost and return structure of fuelwood marketing and identify the factors influencing economic analysis of fuelwood marketing in the study area. Result from the study revealed that marketers' involvement in the venture is based on some factors such as the value of last season of fuelwood products, educational level, experience, amount borrowed and source of initial capital with which the business takes off. It is, therefore, recommended that the government should ensure the rehabilitation of roads leading to the forests so that fuelwood products are made available at the right time The citizens also should be educated on why they need to cooperate with the government to protect the forest by avoiding bush burning and illegal tree felling.