DETERMINANTS OF FUEL WOOD MARKETING IN IGABI LOCAL GOVERNMENT AREA OF KADUNA STATE, NIGERIA

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ABSTRACT

Fuel wood is one of the most useful forest resources consumed by man. Despite the significance of fuel wood in both rural and urban households in Nigeria, it is surprising to observe that very little is known about factors affecting its marketing. The study was designed to access the determinants of fuel wood marketing in Igabi Local Government area of Kaduna State, Nigeria. Multi stage sampling technique was used for the study. A total number of sixty (60) marketers were randomly selected and interviewed using structured questionnaires. Descriptive statistics and regression analysis were used to analyse the data. The result of the study showed that both male (55%) and female (45%) are involved in fuel wood marketing in the study area, age between 21- 30 years (46.67%), married with household size of 6-10 members. Majority (88.33%) had formal education with 6- 10 years of marketing experience. The result of regression analysis revealed that coefficient for years of formal educational, years of experience, household size, transportation cost were significant at P< 0.01 probability level while the coefficient of labour cost was significant at P< 0.05 probability level thus play crucial roles in determining gross return of the respondents. The study also revealed that high cost of transportation (33.33%), seasonality of the year (30%); inadequate capital (25%) and price fluctuation (11.67%) were the constraints of fuel wood marketing in the study area. It was recommended that bad road should be renovated and new ones constructed by the government to provide effective transportation networks to the fuel wood marketers. Also, marketers should come together and form cooperative society where they will pool their resources together for members to obtain loans at very low interest rates to finance and expand their business.

Keywords: Determinants, Randomly, Marketers, Fuel wood, Gross return.

Introduction

Forests are widely recognized as a source of various essential goods and services (DWAF, 2005). In addition to the physical contribution to the environment, forests also provide ecological, economic, social, religious and cultural benefits (Mainagwa, 2010). The functions performed by forests in human societies and its evolvement is enormous than any other resource. According to Nzeh and Eboh (2007), forests contribute directly and indirectly to rural household livelihoods through the generation of income and employment from the sale and exchange of gathered and unprocessed non-timber forest products such as firewood. The term Non- Timber forest Products (NTFPs) emerged as an umbrella to recognize the products derived from these various forest resources as a group (Ibrahim *et al.*, 2016). The list of NTFPs is inexhaustible specific as they include plants used for firewood, handicrafts and carvings, condiments, fodder, chemicals, medicines and even shade (Ibrahim *et al.*, 2016).

Wood which is a major forest product that can be used as timber, pulp and paper or

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fuel wood provides about 3.4 billion cubic meters of timber equivalent annually in all over the world (FAO, 2004). Fuel wood is NTFPs used for industrial and domestic generation of energy especially in developing countries and felling of trees for fuel wood is now consider as the third most important economic activity of people in forest dependent areas followed by farming and animal rearing (FAO,1990).

One of the most useful forest resources consumed by man is fuel wood. Fuel wood comprises of wood and wood pulp material obtained from trunks, branches and other parts of trees and shrubs used as fuel for cooking, heating or generating energy through direct combustion. The term firewood or fuel wood consists of any unprocessed woody biomass used to fuel a small fire, most often for cooking or warmth (Boucher *et. al*., 2011).

Several reasons make the use of fuel wood a location and situational specific source of energy and this may range from social, cultural, environment to economical reason (Horgan, 2001). Previously, wood were harvested in developing countries solely for immediate consumption and was mostly carried out by women and children who gathered the dry tree parts such as trunks, branches and shrubs for fuel wood but nowadays, sporadic rise in the commercialization of agricultural sector has brought about widespread harvesting of both dead and live branches and tree trunks by men, women and children (Awah, 1995).

The rural population traditionally relies on the forest for various food products and fuel wood, both for own consumption and for sales to the urban sector. Fuel wood is the fourth largest energy source providing about 13% of the total energy consumption globally (Magembe and Makonda, 2016). It is consumed mostly by the low income and middle income households as well as operators of cottage and small scale industries and commercial enterprises. Most of this fuel wood comes from forests mainly in the form of wood and charcoal. However, wood with higher density is better suited as fuel wood because it has high calorific value (Magembe and Makonda, 2016). The rural population traditionally relies on these fuel woods for both home consumption and for sales to the urban sector. Chukwu (2001) observed that over 70 percent of the total population of Nigeria relies on fuel wood or charcoal as their major source of energy for cooking and heating purposes. According to Hafeez (2000); Ayotebi, (2000); Chukwu, (2001); and Abebaw, (2007), it was estimated that 70–79% of households use fuel wood as a main source of energy.

Fuel wood is major business in the urban and peri-urban centers in Nigeria and according to Ebe (2006), fuel wood trading is a very profitable business. Fuel wood marketing like every other marketing enterprise involves the exchange between a buyer and a seller at a given price in such that the seller meets the total cost and the profit margin (Kalu *et al.,* 2009). Marketing of fuel wood is simple, basically from producers to consumers in most cases except in few cases where urban fuel wood sellers come to buy in bulks. Large number of prepared- food vendors such as restaurants, vendors of barbecue (*Suya*) and party event outfit that served at celebrations and bakeries are regular customers of fuel wood sellers but institutions such as hospital, schools and prisons; and industries such as blacksmiths are among the highest fuel wood consumers (Larinde and Olasupo, 2011).

The use of fuel wood has been on the increase due to increase in cost and scarcity of alternative sources of energy, particularly Kerosene (Paul, 2008). In addition, firewood is consumed in large

quantities in most parts of rural Africa. In fact much has been known about the use, effect, exploitation and marketing of fuel wood but barely little is known about factors affecting its marketing especially in Igabi Local Government area of Kaduna State. However, Ebe (2006) indicated that in Enugu State of Nigeria, fuel wood supply were influenced largely by socio-economic and production factors such as farmer's age, education, household size, transportation cost, price of fuel wood, labour time, income, price of alternative sources of energy. This paper looks at the determinants of fuel wood marketing in the study area with the objectives of identifying the socio economic characteristics of the respondents, determine factors affecting fuel wood marketing and identify constraints to fuel wood marketing in the study area.

Methodology

Study Area

Igabi is a local government area in Kaduna State with administrative headquarters in the town of Turuku. It has latitude of 10^0 47' 0'' N and longitude 7^0 47' 0'' E. It covers an area of 3727km^2 with a projected population of 581, 500 as at 2016 from the 2006 national population census. It is the largest local government area by population in Kaduna State. Igabi LG is bounded to the north by Giwa and Zaria local government areas, to the east by Soba and Kauru local government areas, to the south by Kajuru, Kaduna North, Kaduna South and Chikun local government area, and to the west Chikun and Birnin Gwari local government areas. It comprises about sixteen districts which are, Amaza, Audi, Bargu, Dunki, Dusten Mai, Eadan Gayan, Faro Kwai, Garda, Gehehu, Igabi, Kerawa, Mangi, Pumbi Dutse, Turunku, Yelwa and Zangon Aya districts. The people of Igabi Local Government Area are predominantly Adara by tribe and speak two other

languages like Hausa and Gbagyi. (NPC, 2010). The climate is marked by rainy season and long dry season. The average rainfall is 1025mm/ annum, falling between May to October which last for about 4 - 5 months a year. The climatic condition of the area is characterized by hot and wet season as in the tropical areas with the months of November to January as harmattan period. Annual temperature ranges between 35°C to 39°C (Wikipedia, 2011).

Sampling Techniques

Multi stage sampling technique was used to obtain respondents for the study. The first stage involved a purposive selection of four (4) districts out of the sixteen (16) districts in Igabi Local Government due to the presence of active fuel wood marketers in the area. Stage two involved purposive selection of One (1) village with high fuel wood marketers from each of the four (4) districts selected to make four (4) villages. The villages are Mando, Jaji, Rigachikun and Rigassa. Lastly, the third stage involves the random selection of fifteen (15) respondents from each of the villages to make a total number of sixty (60) respondents as sample size that was used for the study.

Method of Data Collection

Primary data was used for the study and the data were collected using structure questionnaires designed to capture the objectives of the study and administered to sixty (60) respondents by personal interview.

Analytical Tool

The data collected were analysed using descriptive statistics such as mean, frequency distribution, table, percentages and regression analysis.

Regression Analysis: Regression analysis was used to analyze factors affecting the

marketing of fuel wood in the study area. Three functional forms namely; the linear function, the semi-log and double log function was used to analyzed factors affecting marketing of fuel wood. The best functional form based on coefficient of multiple determinations – R^2, F – statistics, t – ratio and a-priori expectation as well as the number of significant variables was chosen to explain the relationship. The data involving the null hypothesis was tested at 5 and 1 percent level of significant to determine the probability of association between variables.

The model in its general form is represented thus:

$Y = f(X_1, X_2, X_3, X_4, X_5 \ldots\ldots\ldots\ldots\ldots X_{12} + \mu_i)$

The explicit of these functions are as follows:

Linear Function $Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots b_{12}X_{12} + \mu_i$,

Semi Log Function $Y = b_0 + b_1logX_1 + b_2logX_2 + b_3logX_3 + \ldots\ldots\ldots\ldots\ldots b_{12}logX_{12} + \mu_i$,

Double Log function: $Log Y = b_0 + b_1logX_1 + b_2logX_2 + b_3logX_3 + \ldots\ldots\ldots b_{12}logX_{12} + \mu i$

Where, X_1= Age of the respondents (years), X_2 = Gender (Male = 0 Female = 1), X_3 = Years of formal educational (Actual year), X_4 = Years of marketing experience, X_5 = Household size (Actual number, X_6 = engagement (full-time= 0 part time= 1), X_7= Marital Status, X_8 = Selling price of fuel wood ((₦), X_9 = Purchase cost (₦), X_{10} = Transportation cost (₦), X_{11} = Labour cost (₦), X_{12} = Rent paid (₦), b_o = Constant, b_1 to b_{12} = Regression coefficient, μ_i = Error term, X_1- X_{12} = Independent variables or explanatory variables, Y = Gross return from the sales of fuel wood (₦).

A priori Expectation of Signs of Regression Coefficients

X_1 **(Age)** = positive, gross return is related to age, this means that the younger the fuel wood marketers, the more the sales of fuel wood and the higher the gross return.

X_2 **(Gender)** = Positive, gross return is related to gender, increase in male marketer will result in increase in sales of fuel wood and consequently increase in gross return

X_3 **(Years of formal education)** = Positive, sales is related to education, the more the fuel wood marketers are educated the more the sales of fuel wood and the higher the return

X_4 **(Years of marketing experience)** = Positive, sales is related to years spent in fuel wood marketing, this means that the more the year spent in fuel wood marketing the more the gross return

X_5 **(Household size)** = Positive, gross return is related to household size, the more the family members, the more the family labour, the less the marketing cost and the higher the gross return.

X_6 **(Engagement)** = Positive, sales is related to the time spent in business, this means that the more the time spent in fuel wood marketing the more the sales and the higher the gross return

X_7 **(Marital status)** = Positive, gross return is related to marital status, this means that the more the fuel wood marketers are married with responsibility of more family member to cater for the more sales will increase and consequently gross return.

X_8 **(Selling price of fuel wood)** = Positive, increase in selling price of fuel wood will increase in gross return to the marketers.

X_9 **(Purchase cost)** = Positive, gross return is related to purchase cost, this means the higher the amount spent in purchasing fuel wood the higher the gross return

X_{10} **(Transportation cost)** = Negative, gross return is related to the amount spent on transportation, this means that the higher

the transportation cost the lesser the gross return.

X₁₁ (Labour cost) = Negative, gross return is related to labour, this means that the higher the cost of labour the more the gross return will decrease

X₁₂ (Rent paid) = Negative, gross return is related to rent, the lesser the rent paid by the fuel wood marketers the more the gross return

Results and Discussion

Socio economic characteristics of the respondents

The result of socio economic characteristics of the fuel wood marketers on table 1 showed that 55% of the respondents are male and 45% female. This is in line with findings of Ndaghu *et*. *al*., (2011) who reported that male dominated the firewood trade in Yola, but contrary to the reports of Olugbire *et al*., (2016); and Imaobong *et al*., (2017) which found 86% and 92% of the women in fuel wood marketing in Ibadan, Oyo state and Uyo, Akwa Ibom State respectively. This result shows that fuel wood marketing is a business for both male and females in the study area. Though the percentage of male engaged in fuel wood marketing was more than the female, this may be due to the rigorousity of the business which is supposed to be dominated by male gender. It could also be due to the fact that majority of the respondents are Muslims (73.33%) where the religion restrict women only to house hold jobs. The practice of ''purdah'' (women seclusion) is a common practice in the study area. Binta and Undiandeye, (2005) observed that men dominated the marketing of cowpea in Maiduguri because majority of them are Muslims

It was observed that 46.67% and 33.33% of the respondents were between the age range of 21-30 years and 31-40 years respectively, 10% and 6.67% were within

41-50 years and below 21 years of age respectively. Only 3.33% of the respondents were above 50 years of age. This revealed that fuel wood marketing was dominated by youth who were still within their economic active age. This agreed with the finding of Ndaghu *et al.* (2011) which stated that age plays a critical role in firewood trade, the more energetic an individual is, the higher the possibility of him or her to perform better than the very young or very old marketers. This result also collaborated the finding of Afolabi (2001) and Ikurekong *et al.* (2009) who reported that age of marketers had positive impact on the business aggressiveness and flexibility in marketing activities.

The table further showed that majority (53.33%) of the marketers were married while 26.67% are single. This agree with Taphone (2009) who reported that married people have more responsibility in taking care of their families and hence are always making effort to involve in business that will give them financial empowerment. This may be the reason why the business was dominated by the married people unlike the case for the singles who may not likely have other people to take care of beside themselves. The percentage of marketers that are divorced, widowed and widower stood at 13.33%, 8.33% and 3.33% respectively.

In terms of household size, 56.67% of the respondents had the highest household members of 11-15 persons, 25% had between 1-5 household members while 11.67% and 6.67% had between 11-15 and 16-20 household members respectively. This revealed that respondents with large, medium and small household size were found in the marketing of fuel wood in the study area. Marketers with large family size had opportunity of using more of family labour and therefore reduce amount of

money spend on hired labour thereby reducing marketing cost.

The study also showed that majority of the respondents (88.33%) had formal education ranging from secondary (46.67%), primary (33.33%) and tertiary (8.33%) while only 11.67% had no formal education. This showed that formal education is important to being successful in fuel wood marketing because the business involves lots of logical reasoning and calculation. The result also support Afolabi (2001) who stated that the higher the level of education of a marketer, the better the chances of enjoying higher returns from his effort in the business. He also emphasized that marketers with high formal education are more exposed to accepting innovations, new ideas and take calculated risks that can make the business boom and flourish within short period. According to Velde (2005), education helps to attract private capital, access market information and use of more efficient technology that would enhance their output or sales to help them increase their productive capacities. This was also in agreement with Christiansen *et al*., (2003) who stated that households with higher education were less likely than others to fall into poverty, and more likely to escape from it, and far more likely to benefit from growth.

Experience in fuel wood marketing is a measure of the period an individual has been involved in the business/ trading. Marketing experience is an important ingredient to enjoying greater benefits in the business. Majority of the respondents (91.67%) had gained reasonable experience having been involved in the marketing for up to 10 years while 5% and 3.33% had between 11-15 and 16-20 years respectively. This showed that marketing experience is an important factor to consider in fuel wood marketing. It implies that, the higher the marketing experience, the better the chances of having more gains, benefits and returns from the business. This is because a marketer with higher marketing experience would have mastered the dos and don'ts of the business and how to go about the business with minimum inputs. 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. Also, according to Aasa (2006), in his study on the analysis of the factors affecting the marketing and demand for maize seed in Kaduna state pointed out that experience influences individual's perception and understanding of the managerial requirements and sales of goods. In other words, experience would help the traders on how best to manage their fuel wood marketing more efficiently

The nature of engagement showed whether the marketers are involved in full time or part time in the marketing of fuel wood. The table revealed that 81.67% of the respondents are involved in marketing of fuel wood on full time basis and only 18.33% are part time marketers.

Table 1: **Socio economics characteristics of the respondents (N= 60)**

Variables	Frequency	Percentage
Sex		
Male	33	55
Female	27	45
Age		
< 21	4	6.67
21-30	28	46.67

31-40	20	33.33
41-50	6	10
> 50	2	3.33
Marital status		
Single	13	26.67
Married	32	53.33
Divorce	8	13.33
Widow	5	8.33
Widower	2	3.33
Household size		
1-5	15	25.00
6-10	34	56.67
11-15	7	11.67
16-20	4	6.67
Educational level		
Non formal	7	11.67
Primary	20	33.33
Secondary	28	46.67
Tertiary	5	8.33
Marketing experience		
1-5	24	40.00
6-10	31	51.67
11-15	3	5.00
16-20	2	3.33
Nature of engagement		
Full- time	49	81.67
Part- time	11	18.33
Religion		
Muslims	44	73.33
Christianity	16	26.67

Factors affecting marketing of fuel wood in the study area

The relationship between the gross return obtained from marketing of fuel wood by the respondents in the study area was tested with regression analysis using the Ordinary Least Square (OLS) technique (Table 2). Three functional forms: linear, semi-log and double log were tested. Semi-log function was chosen as the lead equation based on econometrics and statistical criteria such as coefficient of multiple determination- R^2, value of F-ratio, t-ratio, a-priori expectations as well as the number of significant variables.

The result of the analysis further showed that the coefficient of age (0.012), gender (0.059), years of formal educational (0.190), years of marketing experience (0.618), household size (0.408), nature of engagement (Full time or part time) (0.098), marital status (0.086) and selling price (0.034) were positively related to gross return obtained from marketing of fuel wood. Thus 0.012, 0.059, 0.190, 0.618, 0.408, 0.098, 0.086, and 0.034 unit increase in each of these variables will bring about a unit increase respectively in respondent's gross return. On the other hand, purchase cost (-0.081), transportation cost (-0.229), labour cost (-0.151) and rent paid (-0.014) were found to be negatively related to gross

return. This means that 0.081, 0.229, 0.151 and 0.014 unit increase in each of these variables will result in corresponding one unit decrease respectively in respondent's gross return.

The coefficient of years of formal educational, years of experience, household size, transportation cost were significant at P< 0.01 probability level while the coefficient of labour cost was significant at P< 0.05 probability level thus play crucial roles in determining gross return of the respondents. Ebe (2006), Samuelson and Nordhaus (2005) noted that socio-economic variables and special influences such as educational attainment, age of suppliers, professional experience and government policy could influence supply of fuel wood positively. According to Imaobong *et. al.*, (2017), in their study of economic analysis of fire wood marketing in Uyo capital city of Akwa Ibom state, Nigeria reported that mode of engagement and scale of operation had significant and positive effect on revenue (p< 0.05), while household size was negative and significant (p< 0.10), educational status, age of trader and marketing cost incurred during the cycle of the business was positive and significant (p< 0.01) respectively. The coefficients of significant variables in this study are explained thus:

The coefficient of years of formal educational (0.190) had positive sign in accordance with a priori expectation and significant at (P< 0.01) probability level. The positive relationship implies that the more years a marketer of fuel wood spend in attaining formal education the more the increase in sales and gross return. This means that education has the power of giving the marketer an edge over their competitors since their level of awareness of market information and use of more efficient methods that will enhance sales thereby increase their gross return.

The coefficient of years of marketing experience (0.618) had positive sign in accordance with a priori expectation and significant at (P< 0.01) probability level. This indicates that the higher the experience the more the sales of fuel wood and the higher the gross return. 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.

The coefficient of household size (0.408) had positive sign in accordance with a priori expectation and significant at (P< 0.01) probability level. This implies that the larger the household size the higher the gross return obtains from the marketing of fuel wood in the study area. The larger household size provides labour for the running of the business. This agreed with the popular expectation that larger household size would provide labour for the enterprise.

The coefficient of transportation cost (-0.229), labour cost (-0.151) and rent paid (-0.014) had negative sign in accordance with a priori expectation and significant at (P< 0.01) and (P< 0.05) probability level. The higher the transportation, labour cost and rent paid by the respondents, the lesser the gross return from marketing of fuel wood. This also corroborated the economic theory which held that the cost of doing business should be minimized as much as possible to enhance high profitability (Azeez *et al.*, 2014; Samuelson and Nordhaus, 2005).

The coefficient of multiple determination-R^2 value of 0.714 showed that the estimated explanatory (independent) variables included in the model explained 71.4% of variation in gross return (dependent variable)) of respondents while the remaining 28.6% was due to error term. The overall goodness of fit, F-value of

38.989 showed that the model was significant at P< 0.01 probability level and that the entire coefficients estimated by the model were not all equal to zero. With this result, the null hypothesis which says there was no significant relationship between the gross return obtained from fuel wood marketing by the respondents and the factors that are affecting it is hereby rejected and the alternative hypothesis accepted. This implies that the variables included in the model determine the gross return obtained from marketing of fuel wood. This simplifies the regression equation to: $Y = b_0 + 0.012\ logX_1 + 0.059\ logX_2 + 0.190\ logX_3{***} + .0.618\ logX_4{***} + 0.408\ logX_5{***} + 0.098\ logX_6 + 0.086\ logX_7 + 0.034\ logX_8 + -0.081\ logX_9 + -0.229\ logX_{10}{***} + -0.151\ logX_{11}{**} + -0.014\ logX_{12} + \mu_i,$

Table 2: **Factors Affecting Marketing of Fuel wood in the Study Area**

	Coefficients				
	Unstandardized coefficients		**Standardized coefficients**		
Variables	**B**	**Std error**	**Beta**	**t**	**Significant**
Constant	2.813	0.418		6.737	0.000
X_1 (Age)	0.010	0.031	0.012	0.313	0.754
X_2 (Gender)	0.000	0.000	0.059	0.878	0.381
X_3 (Years of formal education	0.001	0.000	0.190	2.829	0.005***
X_4 (Years of experience)	0.817	0.066	0.618	12.305	0.000***
X_5 (Household size)	0.001	0.000	0.408	6.167	0.000***
X_6 (Engagement)	0.207	0.149	0.098	1.390	0.166
X_7 (Marital status)	0.052	0.087	0.086	0.600	0.549
X_8 (Selling price)	0.050	0.097	0.034	0.517	0.606
X_9 (Purchase cost)	-0.146	0.185	-0.081	-0.792	0.430
X_{10} (Transportation cost)	-0.298	0.074	-0.229	-4.003	0.000***
X_{11} (Labour cost)	-0.518	0.269	-0.151	-1.922	0.056**
X_{12} (Rent paid)	-0.013	0.112	-0.014	-0.111	0.911
Y= Gross return					
F- Statistics	38.989				0.000***
R^2	0.714				
Adjusted R^2	0.696				

*** Significant at 0.01, Significant at 0.05,

Constraints of fuel wood marketing in the study area

The constraints faced by the respondents in the marketing of fuel wood as presented on table 3 showed that high cost of transportation had the highest value of 33;33%. This suggests that most marketers find it difficult to transport the fuel wood from the source of supply to the marketing points and subsequently to the buyers due to bad road networks. This agreed with the findings of Aremu (2011) who reported that transportation is a major constraint to marketing agricultural products in south western Nigeria. Seasonality of the year is another constraint which accounted for 30%. The respondents opined that because of heavy rainfall during the raining season which hinders the collection and transportation, fuel wood is always scarce but abundant in the dry season. Inadequate capital to expand the business of fuel wood marketing constituted 25% of the respondent's constraints while price fluctuation had the least value of 11.67%.

Table 3: **Constraints of fuel wood marketing in the study area**

Problems	Frequency	Percentages
High cost of transportation	20	33.33
Inadequate capital	15	25
Seasonality of the year	18	30
Price fluctuation	7	11.67

Conclusion

From the findings of the study, it can be concluded that both male and female are involved in fuel wood marketing in the study area, age between 21- 30 years, married with household size of 6-10 members. Majority had formal education (primary, secondary and tertiary education) with 6- 10 years of marketing experience. From table 2, it can be concluded that years of formal educational, years of marketing experience, household size, transportation cost and labour cost are the major determinants of gross return to fuel wood marketing. Based on the data presented on table 3, it can be concluded that high cost of transportation, seasonality of the year, inadequate capital and price fluctuation were the constraints of fuel wood marketing in the study area.

Recommendation

Based on the findings of the study, it is therefore recommended that bad road should be renovated and new ones constructed by the government to provide effective transportation networks to the fuel wood marketers thereby reducing the cost of transportation. Also, fuel wood marketers should come together and form cooperative society where they will pool their resources together for members to obtain loans at very low interest rates to finance and expand their business. Marketing experience is recommended for prospective fuel wood marketer so as to overcome the constraint posed by season of the year. Establishment of woodlot to reduce pressure of fuel wood gathering from the forest and enhancing sustainable forest management.

References

Aasa, O S. (2006): Analysis of the Factors Affecting the Marketing and Demand for Certified Maize Seed in Kaduna State Nigeria. An unpublished Msc Thesis, Department of Agricultural Economics and Rural Sociology, Faculty of Agriculture, Ahmadu Bello University Zaria Nigeria pp29—50

Abebaw, D. (2007). Household determinants of fuelwood choice in urban Ethiopia: *a case study of Limma town. Journal of Developing Areas.* 41(1) pp. 117-126

Adeoye I.B., Olajide-Taiwo, F.B, Adebisi-Adelani O., Usman J. M, Badmus M.A (2011). Economic Analysis of Watermelon Based Production System in Oyo State, Nigeria. ARPN *Journal of Agricultural and Biological Science,* 6(7): 53-59.

Afolabi (2001) in Ndaghu, A. A., V. B. Taru, I. Tizhe and J. Tizhe (2011). Analysis of Socio economic Characteristics of Fuel Wood Marketers in Yola Metropolis, Adamawa State, Nigeria. *Journal of Human Ecology,* 36(2): 153-157.

Aremu, F. J. (2011) Marketing of Fresh Tomatoes in Oyo State. Nigeria. B.sc. Thesis, Department of Agricultural Economics, Obafemi Awolowo University, Ile Ife, Nigeria.

Ayotebi, O. (2000). Overview of Environmental problems in Nigeria. National Centre for Economic Management and Administration (NCEMA) Paper presented at the

Conference on Environment and Sustainable Development: Ibadan, 17-18 August.

Awah S.B. (1995). The rural woman and the importance of fuel wood in household energy consumption in the Diamare division of the Far North Province. Student end of course memoir. National Institute of Rural Development. Dschang, University Center.

Azeez F. A., Ajayi C. A., Olarewaju T. O., Nosiru M. O., Farinola L. A. (2014). The Utilization Pattern and Economic Evaluation of Fuelwood Enterprise: A Case Study of Some Areas in Ibadan Metropolis, Oyo State. *International Journal of Agriculture, Forestry and Fisheries.* 2(6): 91-95.

Binta, A.Z and Undiandeye, U.C (2005): An Analysis of Price Fluctuation of Cowpea in Maiduguri Metropolitan, Nigeria *International Journal of Food and Agricultural Research.* The Development of Universal Consortia. (2)1; 22—30

Boucher, D., Elias, P., Lininger, K., May-Tobin, C., Roquemore, S. and Saxon, E. (2011). The Root of the Problem: What's Driving Tropical Deforestation Today? (Cambridge, MA: Union of Concerned Scientists. Retrieved from www.jstor.org/stable/resrep00075

Christiaensen, L., L. Demery and S. Paternostro (2003) 'Macro and Micro Perspectives of Growth and Poverty in Africa', World Bank draft.

Chukwu, I. E. W. (2001). Agricultural sustainability and farmers' decisions at farm level. In: Sagary N (ed). Proceedingof the 6th scientific workshop of Sub-Saharan AfricanNetwork (SUSAN) held at the International Institute ofTropical Agriculture (IITA), Ibadan, Nigeria, August 23-27.

DWAF, (2005). Draft Key Issue on Forestry and Poverty in South Africa. Department of Water Affairs and Forestry, Pretoria, South Africa. Pp 1-32.

Ebe, F. E. (2006). Economic study of fuelwood marketing and consumption in Enugu State, Nigeria. A Ph.D Research findings presented to the Department of Agricultural Economics, University of Nigeria, Nsukka. August.

F.A.O. (1990): The fuel wood crisis and population Africa. Parts 1-4.

F.A.O. (2004): Assessing Forestry Project Impact: Issues and Strategies, F.A.O., Rome 4-6pp., http://www.cifor.cgiar.org/Publications/Corporate/FactSheet/livelihood.htm

Hafeez, S. M. (2000). Bio-energy for meeting growing energy needs. *In:* RWEDP[Regional Wood Energy Development Programme], editor. *Wood Fuel Productionand Marketing in Pakistan. National Workshop, Faisalabad, Pakistan,28-30 October 1997.* RWEDP Report No 49. Bangkok, Thailand: FAO [Foodand Agriculture Organization of the United Nations], pp 143–149.

Horgan, G.P. (2001) *Wood energy economics crisis*. IIED, GateKeepers Series No SA18, London.

Ibrahim. A.O., Ampitan.T.A., Adeniji.O.A., Olayinka, A.P., Babatunde, K.O. (2016). Utilization of Non-Timber Forest Products (NTFPs) in New Bussa, Nigeria. *International Journal of Research in Agriculture and Forestry* 3(10): 1-7

Ikurekong E. E., Esin J. O. and Mba, A. C. (2009). Rural Fuelwood Exploitation in Mbo Local Government Area - A Nigerian Coastal Settlement. *Ethiopian Journal of Environmental Studies and Management* 2(3): 44-55.

Imaobong, U. N., Enefiok, S. U., and Daniel, E. J. (2017). Economic analysis of firewood marketing in Uyo capital city, Akwa, Ibom state, Nigeria.

Eurasian Journal of Forest Science 5(2): 26-43

Kalu C; Atagana, S and Ani, P.I. (2009): Marketing of Round Logs in Benin City, Edo State, Nigeria. *Journal of Applied Science Research*, 5(7): 785-789.

Larinde, S.L. and Olasupo, O.O (2011): Socio-economic importance of fuel wood production in Gambari Forest Reserve Area, Oyo State. *Journal of Agriculture and Social Research* 11(1), 201-210.

Magembe, K. S. and Makonda, F. B. S. (2016) Tree Species Preferred for Wood Fuel in Brick Making in Morogoro Municipality, Tanzania. *Malaysian Journal of Medical and Biological Research* 3(1)1: 25-30

Mainagwa, M. G. (2010). Fuelwood Markets in Sub-Saharan Africa: *Factors which Impede, and Incentives which will accelerate their Development*. 6(1): 36 – 48.

Ndaghu A.A, Taru V.B, Tizhe, I, Tizhe, J (2011). Analysis of Socio-Economic Characteristics of Fuel Wood Marketers in Yola Metropolis, Adamawa State, Nigeria. *Journal of Human Ecology*, 36(2): 153-157.

NPC, (2010). National Population Commission. Population and housing census of the Federal Republic of Nigeria. Abuja: National population Commission;

NPC, (2006). National Population Commission of Nigeria (web), National Bureau of Statistics (web)

Nzeh, C. E. P. and Eboh, E. C. (2007). Analysis of Income Effects of Forest Products Activities among Rural Households in Enugu State, Nigeria. *Journal of Agriculture and Social Research*. 7(1):23-33.

Olugbire, O. O., Aremu, F. J., Opute, O. H., Ojedokun, C. A., Ayomide, A. A., and Oguntoye, T. O. (2016). Contribution of fuel wood marketing to sustainable livelihood In Oyo state. *Russian Journal of Agriculture and Soci-Economic Sciences*, 3(51), pp. 52-57. DOI http://dx.doi.org/10.18551/rjoas.2016-03.05

Paul, J. (2008). Comparative Analysis of household Energy use in Yola Metropolitan Area. An unpublished M.Sc Thesis Department of Agricultural Economics and Extension, Federal University of Technology, Yola Adamawa state Nigeria.

Samuelson, P. A. and Nordhaus, W. D. (2005). *Economics*.18th Edition. New Delhi: TATA Mc-Graw Hill.

Taphone, B. G (2009) Resource Productivity and Eficiency of Groundnut Farming in Northern Part of Taraba State, Nigeria. MSc.Thesis. Department of Agricultural Economics and Extension, Yola Adamawa State Federal University of Technology.

Velde, D. W. (2005). Globalisation and Education What do the trade, investment and migration literatures tell us? Working Paper 254.

Wikipedia (2011): Attitude (Psychology). Available free online information. Retrieved January 2008, from: http:en.wikipedia.org/wiki/Attitude (psychology)#column-one.