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Abstract- This study was conducted to examine the socioeconomic determinants of fuelwood usage by bread producers in Owerri North Local Government Area of Imo state. A total of 50 bread producers were sampled using simple random sampling technique. The data realized were analyzed using simple descriptive statistics and multiple regression models. Results shows 48 years as the mean age of the respondents and their household size were 5 persons while the number of years spent in formal schooling were 18 years among others. From the regression results, bakery experience in years ($x=0.33$, $p<2.10$) and years of schooling ($x=0.43$ $p<2.10$) were statistically significant in increasing the quantity of bread produced. It was also learnt that the major constraints encountered were high cost of raw materials. Therefore government should ensure a stable price regime, regular power supply which reduces over dependence on fuel wood energy and GHG emission.

Keywords: *fuel wood, bread producers, imo state, nigeria.*

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Socio-Economic Determinants of Fuelwood usage by Bread Producers in Owerri North Local Government Area of Imo State, Nigeria

Unaeze, Henry Chiaka [α] & Anyanwu, Jecinta Adaugo [σ]

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Keywords: fuel wood, bread producers, imo state, nigeria.

I. Introduction

Fuel wood is a wood and pulp material obtained from the trunks, branches and other parts of trees and shrubs which is used for cooking, heating or generating of energy through direct combustion (De Montabembert & Clement, 1983). Fuel wood is needed for light, heat as well for cooking and access to this resource can help improve the health and education of households by improving air pollution quality and allowing light to study at night (Heltberg, 2005). Most people both in urban and rural areas; earn their income from the wood fuel business which involve growing, harvesting, processing, trading, transporting or retailing (FAO- Regional Energy Development Programme, 1999). Most women go into full time harvesting of fuel wood and to others; it is a source of extra income or even a survival strategy in times of hardship (FAO, 1999). Fuel wood is used not only for cooking by most rural women but also in the production and baking of bread by local bread producers.

Fuel wood is the predominant source of energy in rural and sub-urban areas as a result of its low cost and also because it serves as a means of livelihood for individuals who engage in the business. According to Ebe (2014) fuel wood rate of consumption in Africa rose by 23.08% from 154 million to 190.2 million metric tons in 1975 and about 95% consumed in Nigeria. Wood energy is the most important source of bio-energy in the world, providing 9% of the global primary energy supply (FAO, 2010). According to Maconachie, Tanko, and Zakariya. (2009) over dependence of wood energy by most people is as a result of several factors such as population increase, poverty as well as inconsistency in the supply of fossils fuels. Increased poverty has frequently been reported in both developed and undeveloped countries as one of the major driving forces for the increase rate of fuel wood consumption. According to Goldthau, & Witte (2010) fuel wood still accounts for up to 80% of Nigeria energy consumption due to poor access to modern energy sources. It has been estimated that the number of people using fuel wood will rise by more than 40% between 2000 and 2030 to about 70 million making, forest resources becomes most endangered natural resources.

Nigeria is losing about 351, 000 Km2 to the desert representing 38% of its total landmass. The strives for survival coupled with geometric population growth worsened by extreme poverty in most of the developing countries as well as the quest for more comfort are the major causes of natural resources depletion the world over. Regional analysis of the use of wood as a major source of energy requirements indicates that in Eastern, Western and Southern Africa, more than 90 percent of rural households depend on fuelwood and charcoal (Adeniyi, and Felix 2011). One of the environmental resources which have been over-exploited in Nigeria without adequate replacement is forest resources, especially wood products (Audu, 2013). Fuelwood consumption is estimated at about 80 million cubic meters (about 25 million tonnes) and this traditional energy source accounts for about 55 percent of Nigeria's primary energy requirements (Friends of the Environment, 2005). The rate of deforestation as a result of fuel wood consumption is about 350,000 hectares/year, which is equivalent to 3.6% of the present area of the forests and wood land, whereas, reforestation is only 10% of deforestation rate (ICCDD,

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2000). It is obvious that the use of fuel wood by bread producers has its social, economic as well as environmental consequences. So, there is need to establish the socio-economic determinants of fuel wood usage by bread producers in Owerri North local Government Area of Imo state, Nigeria.

a) Specific Objectives of this study are to

i. detetermine the socio-economic characteristics of bread producers in the study area.
ii. determine the socio-economic factors that influence the output by bread producers in the study area.
iii. determine the source of domestic energy used by the bread producers in the study area.
iv. identify the constraints faced by the bread producers in the study area.

II. Materials and Methods

a) Area of Study

This study was carried out in Owerri North Local Government area of Imo state with its headquarters are in the town of Orie Uratta. It has an area of 198 square km and a population of 175,395 at the 2006 census. It is a semi-urban government area and encircles Owerri Municipal like a peninsular. There are six major roads that lead out of the municipal and it cuts across Owerri North Communities. It is comprised of seven towns/ districts which are: Egbu, Emekuku, Emii, Ihite-Ogada, Naze, Obibi-Uratta, and Orji. Their major occupation is predominantly farming.

Imo state lies in the South East of Nigeria with Owerri as its capital and largest city occupying the area between the lower River Niger and the upper and middle Imo River. It lies within latitudes 4°45'N and 7°15'N, and longitude 6°50'E and 7°25'E with an area of around 5,100 sq km. There are 26 local governments in Imo state. It is rich with natural resources such as: crude oil, natural gas, lead, white clay, fine sand, limestone, as well as zinc. The economy of the Imo State depends primarily on agriculture and commerce. Their cash crops include oil palm, raffia palm, rice, groundnut, melon, cotton, cocoa, rubber, maize, etc. food crops such as yam, cassava, cocoyam and maize are also produced in large quantities.

III. Results and Discussion

a) Socio-economic characteristics of the bread producers in the study area

The socio-economic characteristics of the bread producers in Owerri North Local Government area of Imo State presented in the table 1 below revealed that, majority (84%) were males who dominates in the industry than females due to drudgery nature of bread production. However (50%) are within the age range of 41-50 years, while their mean age is 48 years, indicating activeness in age. Majority (90%) are married and (54%) had tertiary education signifying innovativeness as education influences individuals and household's rate of adoption of new and improved technology as well as choice of food commodities Fapojuwo (2010).Household size shows that (58%) have 4-6 persons and the average household size was 5 persons implying that respondents had a medium household size. Respondents had an average experience of 17 years implying that most of the bakeries are usually family owned. The bakery capacity is within 16-20bags, implying adequate use of flour for production which results to good quality product. Majority sampled have an income level of ₦2,000,000 annually and an average income of ₦1,570,020. This implies that small and medium scale bread enterprise is a viable venture being located mostly in the rural part of the study area.

Table 1: Frequency distribution of respondents according to their socio-economic characteristics in the study area

Socio-economic characteristics of bread producers in the study area.

	Items	Frequency	Percentage	Mean
Sex	Male	42	84	
	Female	18	16	
Age	21-30	03	06	
	31-40	06	12	
	41-50	25	50	48
	51-60	10	20	
	Above 60	06	12	
Marital Status	Married	45	90	
	Single	05	10	
Educational Level	Primary			
	Secondary	05	10	
	Tertiary	18	36	14
		27	54	
Household size	1-3	10	20	

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	4-6	29	58	5
	7-9	11	22	
Bakery experience	1-10	14	28	
	11-20	21	42	17
	21-30	11	22	
	31-40	04	08	
Bakery capacity (number of bags used per day)	≤10	05	10	
	11-15	10	20	20
	16-20	15	30	
	21-25	11	22	
	26-30	08	16	
	≥30	01	02	
Income	≤100,000	08	16	
	100,001-500,000	10	20	
	500,001-1,000,000	01	02	N1,570,020
	1,000,001-1,500,000	06	12	
		09	18	
	1,500,001-2,000,000	16	32	
	≥2,000,000			
Bakery location	Rural	32	64	
	Urban	18	36	

Source: Field survey data, 2017

b) Sources of Energy used by Bread Producers in the study area

Table2, below shows the various energy sources used by bread producers in the study area. From the table 2, below majority 68% use fuel wood energy for production in the study area. This finding is in consonance with Adeniyi and Felix (2011) who stated that small scale enterprises in the informal sector, being essentially profit oriented, tend to use the cheapest and most reliable fuels (fuelwood), due to the periodic and chronic shortages of commercial fuels such as gas and kerosene experienced in the country from time to time. The table also asserts that only 12% producers make use of electric oven for their production. It was further revealed that electricity is also used by the producers alongside fuel wood in the study area. This implies that most of the bread producers in the area do not depends on one energy source. It should be noted that the usage of these two energy sources depends on the economic status of the producers. Also, other sources of energy are rarely used in the study area. This is in line with the findings of Schalag and Zuzarte (2008) who revealed that most rural areas predominantly utilize fuel wood energy. Asfuel wood constitutes a major source of domestic energy for production by the bread producers it therefore poses a major threat to forest resources which invariably lead to deforestation as noted by Energy Commission of Nigeria (2003) who accentuated that fuel wood supply/demand imbalance in some parts of the country is now a real threat to the energy security of the rural communities. Their findings conform to the findings of Ikurekong *et al*. (2009) that exploitation of fuel wood is intensified by inaccessibility ofother energy sources.

Table 2: Distribution of respondents according to Sources of energy used for production

Items	Frequency	Percentage
Fuelwood	34	68
Electric Oven	06	12
Both Fuelwood and Electricity	10	20
Total	**50**	**100**

Source: Field data survey, 2017

c) Sources of Fuel wood in the study area

Table 3 below shows the sources of energy used by the bread producers in the study area. In the table3 below, majority of the producers (62%) source their fuelwood on contract basis from suppliers who engages infuel wood collection as a source of livelihood activities, while 22% source from the open market and this agrees with the findings of FAO Regional Energy Development Programme (1999) who reported that, most people both in urban and rural areas; earn their income from the wood fuel business which involves growing, harvesting, processing, trading, transporting or retailing.

Table 3: Distribution of respondents according to Sources of fuel wood in the study area

	Frequency	Percentage
Individual	08	16
Contract	31	62
Open Market	11	22
Total	50	100

Source: Field data survey, 2017

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d) Effects of respondents socio-economic factors on their output in the study area

Table4: shows the socio-economic factors that influence the output of the bread producers in the study area. The F- ratio for each functional form is significant at 1% and this imply that each of the functional form can be used for further analysis and are adequate. The model chosen was not only based on the strength of the R-squared but rather on the considerations of the signs of the coefficients with respect to economic theory, lowness of the Akaike information criterion or Schwarz criterion (Greene, 2008; Gujarati, 2006). Therefore the lead equation chosen is the double log model based on its F-ratio, R^2, and the low Akaike Information Criterion (AIC) value of -2.711736 which was significant at 1% and a better criterion for a non-tested model. From the table 4,below educational level and bakery experience were significant at 1% and this conforms to the *a priori* expectations because it believed that education improves one's knowledge and according to Fapojuwo (2010), it influences the level of adoption of improved technology which invariably should have a positive effect on the output of the bread producers. It also implies that the more years a producer spend in attaining formal education, the more the increase in their output and this conforms to the findings of Onoja and Emodi (2012) who reported that education has the power of giving trader an edge over their counterpart as their level of awareness of the use of efficient technology and market information will enhance their output thereby increasing their productive capacities. Bakery experience was significant and had a positive coefficient which implies that a unit increase in the experience of the bread producers will cause an increase in the income level of the bakers. The R^2 of 73.86% implies that explanatory variables of the double logged model were able to explain 73.86% of the output of bread produced in the study area.

e) Estimated Socio-economic factors that influence the output of the bread producers in the study area

Variables	Linear	Semi Log	Double Log
Constant			
Coefficient	-4319.77	7.52935***	5.63686***
Standard error	3005.74	0.346634	1.1097
Gender			
Coefficient	1819.37*	0.258056**	0.0240109
Standard error	946.811	0.10919	0.0137856
Age			
Coefficient	81.842	0.00786456	0.242923
Standard error	61.3194	0.00707159	0.258152
Marital status	493.702	0.138561	-0.0247637
Coefficient	1441.63	0.166255	0.0298699
Standard error			
School			
Coefficient	272.836**	0.0279007**	0.333435***
Standard error	102.317	0.0117996	0.115291
Household size	284.566	0.026127	0.125755
Coefficient	280.798	0.0323828	0.133801
Standard error			
Bakery experience	153.497**	0.0198261***	0.430605***
Coefficient	59.3907	0.00684917	0.0799721
Standard error			
Income			
Coefficient	3.26796e-05	1.94111e-09	0.0239088
Standard error	2.47026e-05	2.8488e-09	0.024519
R-Squared	0.622148	0.636311	0.738604
F-Statistics	9.879241	10.49763	16.95372
S.D dependent	3373.038	0.396494	0.396494
P- Value (F)	3.23e-07***	1.52e-07***	2.10e-10***
Akaike Criterion	920.5780	13.80141	-2.711736

*Source: Field data survey, 2017 ***, **, * = significant at 1%, 5% and 10% respectively*

f) Constraints encountered by the bread producers in the study area

Table 5, below shows the various constraints encountered by the bread producers in the study area. High cost of raw materials was identified as the major constraints affecting their production followed by price fluctuation, government policy and high cost of petroleum and diesel products. This result implies that the bread producer experienced increasing cost of raw materials for production ranging from flour to the least material needed for production. According to them, there have been a sharp increase of price of raw materials causing an increase in the cost of production which invariably will affect the price of bread and causes reduction in the purchase of the commodity because consumers will not be willing to purchase bread at a higher price which invariably will have an effect on their

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income level and this conforms to the law of demand which states that the higher the price, the lower the quantity demanded ceteris paribus. They also lamented that on the substandard quality of the raw materials, which in turn , resulted to low output. Government policy is also seen as a major constraint and this arises from the payment of several fees ranging from tax, emblem, union fee among others. This also has an effect on their output as, according to them, they do not receive incentives from government but are mandated to pay huge sum of money monthly. They also suffer from various health issues associated with the usage of fuelwood which results from the inhalation of the smoke arising from the incomplete combustion of the fuelwood and this might lead to respiratory disease, cancer, among others and this is in consonance with the report by the WHO (2006) which stated that cooking with fuelwood is a major source of global ill health. According to respondents sampled, there has been an increasing rate of cost of raw materials ranging from flour to the least material needed for production. Also, they lamented that roadsnetworks affect their distribution which hinders their supply chain. Excessive rainfall affects the rising of yeast negatively as it requires heat.

Table 5: Distribution of respondents according to constraints encountered in the study area

Constraints	Frequency	Percentage
High cost of raw	50	100
materials	45	90
Price fluctuations	42	84
Government policy	40	80
High cost of petroleum	38	76
and diesel products	36	72
Power fluctuation		
Inadequate finance		
Health issues	35	70
High cost of labour	30	60
High cost of	25	50
transportation		
Inadequate fuelwood	22	44
Environmental	22	44
regulation		
Weather problem	22	44

Source: Field data survey, 2017. Multiple responses recorded

IV. Conclusion

It can be deduced that years of schooling and bakery experience are significant at 1% in influencing the output of bread produced in the study area. There was an over dependence of fuel wood energy by producers as compared to other energy sources due to erratic power supply. The major challenge is high cost of raw materials and government should endeavor to create conducive environment for producers in the study area.

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