Original Research Article

Comparative Studies of Household Energy Use in Nigeria: A Case Study of Gwagwalada and Gwako in Gwagwalada Area Council of Abuja-FCT

S. G. Zaku[1*], A . Abdallah[1], J.S. Olayande[1], Kabir A[1] and Tukur, A. A[1]

Department. of Energy Planning and Analysis, Energy Commission of Nigeria,
Plot 701C, Central Area, P.M.B 358, Garki, FCT- Abuja, Nigeria.

The study investigated the household energy use between the Gwagwalada Town and Gwako village of Gwagwalada area council; FCT Abuja Nigeria. Stratified sampling technique was used to select the sample size of 100 respondents (50 from the G/lada Town and 50 from the Gwako village). A set of pretested and structured questionnaire was used in data collection. The result showed that G/lada households utilized modern domestic energy types (LPG, kerosene and electricity) than Gwako households. The result of the Pearson correlation analysis showed that there is a significant positive correlation between the type of energy use and dwelling places, education qualification and monthly income. Those who live in the G/lada Town, place much emphasis on safety and convenience in their choice of energy use while the majority of the Gwako dwellers emphasized income in their choice of cooking energy. I therefore recommend that the government should further subsidize the energy prices and provide basic facilities for the supply and distribution chain to make these energy types available and affordable.

INTRODUCTION

In developing countries, most of the rural communities have less access to modern and clean energy sources and mostly depend on traditional fuel (biomass) for virtually all their energy requirements. It has been estimated that more than 2 billion people globally depend on biomass to meet their basic energy needs and currently, biomass accounts for about 20% of the world's energy supply (FAO, 2006). Without new policies, the number of people globally that rely on biomass fuels is expected to increase to 2.7 billion by 2030 due to population growth (IEA, 2006). Over 60% of Nigeria's population depend on firewood for cooking and other domestic uses (ECN, 2003).

The rural areas, which are generally inaccessible due to absence of good road networks, have little access to conventional energy such as electricity and petroleum products. Petroleum products such as kerosene and gasoline are purchased in the rural areas at prices very high in excess of their official pump prices. The rural populaces, whose needs are often basic, therefore depend to a large extent on firewood as a major traditional source of fuel. It has been estimated that about 86% of rural households in Nigeria depend on firewood as their source of energy (Williams, 1998).

Household Energy consumption accounts for about 80% of total energy consumption in developing countries while cooking energy account for about 95% of this (Arnold et al., 2003). Energy for cooking could be in the form of firewood, charcoal, sawdust, kerosene, gas and electricity. Cooking energy has environmental implication as well as affecting the income of women who primarily cook for family as efficient cooking energy gives time for other income generating activities. Empirical evidence has shown that for many households, the decision over which fuel to use or how much of the fuel to use, requires the consideration of several important factors. For instance Narain et al (2008) found that firewood use and dependence (defined as its contribution to the total 'permanent income' of households) increases with forest biomass availability irrespective of income levels.

Also, access to electricity has been found to be another important determinant of the energy transition (Campbell et al. 2003; Ouedraogo 2006). Others are house standard, level of education of husband and wife, occupation of wife, frequency of cooking certain meals and household size (Madubansi and Shackleton, 2007).

Corresponding Author: S. G. Zaku[1], Energy Commission of Nigeria, Plot 701c Central Area, P. M. B 358 Garki, FCT- Abuja, Nigeria.
Email: zakusamaila@yahoo.com

Table 1: Socio-economic Characteristics of Respondents

Parameter	Frequency		
	Gwagwalada (%)	Kwako (%)	Total (%)
Ages			
20 – 30 years	14.0	20.9	34.9
31 – 40 years	17.4	14.0	31.4
41 – 60 years	15.1	11.6	26.7
Above 60 years	2.3	4.7	7.0
Total			**100**
Family Size			
2 Persons	1.2	0	1.2
2- 4 Persons	34.9	11.6	46.5
4- 6 Persons	10.5	19.8	30.2
Above Persons	2.3	19.8	22.1
Total			**100**
Educational Qualification			
No formal Education	1.2	2.3	3.5
1st School Leaving Cert.	7.0	10.6	17.6
SSCE	14.7	13.0	27.7
OND/NCE	7.0	9.3	16.3
Degree and Above	22.9	12.0	34.9
Total			**100**
Occupation			
Unemployed	4.8	2.2	7.0
Employed	45.0	48.0	93.0
Total			**100**
Income/Month			
₦18,000 and Below	6.8	4.8	11.6
₦18,001 – 40,000	18.6	33.6	52.2
₦40,001 – 80,000	14.0	8.2	22.2
₦ 80,001 – 100,000	5.8	3.5	9.3
Above ₦100,000	4.7	0.0	4.7
Total			**100**
Type of Dwelling Place			
Single Room	8.1	14.1	22.2
Room and Parlour	12.6	20.9	33.5
2 and 3 bedroom Flat	22.9	14.3	37.2
Duplex	1.8	0.0	1.8
Detached Houses	5.3	0.0	5.3
Total			**100**

Table 2: Type of Cooking Energy use according to Location

	Type of cooking energy (%)					
	Fire wood	Charcoal	Kerosine	Gas	Electricity	**Total**
Location						
Gwagwalada	1.2	2.3	25.6	17.4	2.5	49.0
Gwako	5.0	4.3	38.4	2.3	1.0	51.0
Total	6.2	6.6	64.0	19.7	3.5	**100**

Table 3: Monthly Income level and Type of cooking energy

	Type of Cooking Energy					
	Fire wood	Charcoal	Kerosene	Gas	Electricity	Total
Income						
₦18,000 and below	4.7	2.3	4.6	0	0	11.6
₦ 18,001 – 40,000	1.2	3.4	20.3	0	0	24.9
₦ 40,001 – 80,000	1.0	1.2	12.4	3.3	1.2	19.1
₦ 80,001 – 100,000	0	0	10.3	5.8	2.2	18.3
Above ₦100,000	0	0	6.2	15.4	4.5	26.1
Total	6.9	6.9	53.8	24.5	7.9	**100**

Table 4: Type of cooking energy and weather satisfied or not

Type of cooking energy	Yes (%)	No (%)	Total
Fire wood	1.2	2.3	3.5
Charcoal	2.3	7.0	9.3
Kerosene	22.6	33.2	55.8
Gas	27.9	0	27.9
Electricity	2.3	1.2	3.5
Total	56.3	43.7	**100**

Table 5: Location and Factor influencing choice of energy use

	Factors influencing choice of energy use						
Location	Income	Weather	Type of dwelling place	Price	Nearness to sources	Safety and Convenience	Total
Gwagwalada	14.0	1.2	9.2	5.8	7.1	16.3	53.6
Gwako	26.3	3.5	7.2	4.7	3.5	1.2	46.4
Total	40.3	4.7	16.4	10.5	10.6	17.5	**100**

Table 6: Correlations Analysis.

	Type of cooking energy	Type of dwelling place	Educational qualification	Monthly income level
Pearson correlation	**1**	0.301*	0.397*	0.249*

*Positive Correlation between types of cooking energy and dwelling places, education qualification and monthly income.

Studies have looked at the disparity between household energy consumption, but this study carries out a comparative analysis of household cooking energy consumption to see if there are differences in the determinants of cooking energy demand between urban and rural areas in Abuja FCT, specifically between Gwagwalada Town and Gwako village in Gwagwalada Area Council.

LITERATURE REVIEW

Ouedraogo (2006) in his study of Household energy preference for cooking in urban Ouagadougou, Burkina Faso, realized that household cooking energy preference, are due to poverty factors. Fawehinmi et al (2002) also uses a descriptive statistical approach to depict how the massive increased cost of modern fuel has increased the level of poverty in Nigeria with fuel wood energy remaining the fuel of choice for most households. A World Bank studies in 2004 shows that there is a high relation between the level of poverty and the type of energy used for cooking by Household.

METHODOLOGY

Primary data were obtained through questionnaires administered on households in the two different locations. Samples of 100 were selected with 50 from each location. Only 86 questionnaires were found usable with 44 from G/lada Town and 42 from Gwako village. The questionnaires were analyzed using both descriptive and inferential statistics (Donelly G,1999).

FINDINGS AND CONCLUSION

a) Economic factor plays an important role in the choice of energy used for cooking.

b) There is a positive correlation between the type of energy use and dwelling places, education qualification and monthly income.

c) Those who live in the G/lada, place much emphasis on safety and convenience in their choice of energy use while the majority of the Gwako dwellers emphasized income in their choice of cooking energy.

d) The use of kerosene is common in both G/lada and Gwako but gas is used mainly in the G/lada.

e) Firewood and charcoal are used majorly in the Gwako while cooking gas is used majorly in the G/lada.

f) Almost half of those who cook with kerosene are not satisfied with this energy source while all those who cook with gas are satisfied with their choice.

RECOMMENDATIONS

1. In view of the fact that many people prefer to use gas for convenience, efficiency and neatness but cannot afford it Government should make gas available at cheaper rate as this will minimize environmental problems caused by the use of wood fuel.

2. For the household in the rural area government should provide a modern way of using this wood fuel so that the environmental and the health hazard of these types of energy sources are reduced.

3. The use of energy efficient stoves should be encouraged as this can greatly improve the combustion of fuel so that they emit very little smoke.

4. The institution of the renewable energy policy should be put in place as a matter of deliberate policy. This policy will make domestic energy not only available, but affordable to both urban and rural areas.

5. The above would go a long way to improve the standard of living of women by giving them more time to do other income generating activities.

REFERENCES

Arnold MG, Kohlin R, Person G, Shepherd (2003). Fuel wood Revisited. What has changed in the Last Decade? Center for International Forestry Research (CIFOR).

Campbell, B.M., Vermeulen, S.J., Mangono, J.J., Mabugu, R.,(2003). The Energy Transition in action: Urban Domestic Fuel Choice in a changing Zimbabwe. *Energy Policy* 31, 553–562.

Donelly G (1999). A foundation in Economics. Stanley Thorns Ltd, Chetenham, England pp44 – 67.

Energy Commission of Nigeria, (2003). National Energy Policy, Federal Republic of Nigeria, Abuja.

Fawehinmi AS, Oyerinde OU (2002). Household Energy in Nigeria. The challenge of pricing and poverty in fuel switching. *Journal of Energy and Development* 27 (2), 277–284.

Food and Agricultural Organization, (2006). World agricultural Report: Quoting estimates from IFAD

International Energy Agency, (2006). World Energy outlook, Paris OECD

Madubansi, M.and C.M. Shackleton (2007). "Changes in fuelwood use and selection following electrification in the Bushbuckridge lowveld, South Africa." *Journal of Environmental Management*, 83:416–426.

Narain, U., S. Gupta and K. van't Veld (2008). 'Poverty and resource dependence in rural

India', *Ecological Economics* 66 (1): 161-176.

Ouedraogo B (2006) Household Energy Preferences for cooking in Urban Ouagadougou Burkina Faso. *Energy policy 34:3787 – 3795.*

WB (2004): Energy & Development Report 2003: Energy Services for the World's Poor, World Bank Publication.

Williams, C. E. (1998). "Reaching the African Female Farmers with Innovative Extension Approaches: Success and Challenges for

the future "Paper Presented to the International Workshop on Women Agricultural Intensification and Household Food Security At University of Cape Coast, Ghana, 25th-28th June.