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Energy utilization and realization of Sustainable Development Goals nexus among rural households in Imo State, Nigeria

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Abstract
This study analyzed rural household's access and utilization of domest ic energy as it affects the realization of Sustainable Development Goals (SGDs) in Imo State. Multi-stage random sampling technique was used in selecting 120 respondents for the study. The study described the socio-economic characteristics of the respondents, described their household energy types, determined respondents' knowledge of the SDGs and ascertained the extent of respondents' awareness of the effects of their energy use on the realization Sustainable Development Goals. Results show that 53.33% of the respondents were male, 67.50% had formal education while their mean monthly income was ₦22, 500. The major type of household energy among respondents was fuelwood (87.5%). Majority (75.83%) of the respondents did not know about the SDGs. On a five-point Likert scale, a mean score of ($\bar{x}$= 2.50) shows that respondents were not aware of the effects of their energy sources on the realization of the SGDs. Socio-economic factors that positively influenced the respondents' knowledge of SDGs were educational status, income and access to agricultural extension officer while age had a negative influence on their knowledge of SDGs (at $p<0.05$). The study concludes that the relationship between energy use and attainment of SDGs has not been adequately communicated to the respondents and recommends that more awareness campaign on the SDGs be carried out in the rural communities.

Keywords: Energy, Rural, Households, Sustainable, Development, Goals

Introduction
Energy is one of the most important inputs for sustaining people´s livelihoods (Irfan, 2011). Household energy consumption refers to the amount of energy resources that are spent by households on various appliances (Danlami, Islam, Applanaidu, 2015). Access and utilization of clean and affordable energy sources is a substantial factor towards the attainment of the Sustainable Development Goals (SDGs). According to Lusambo (2016), International Energy Agency (IEA) reports that nearly 2.5 billion people rely on biomass fuels for cooking and heating with the figure expected to increase to 2.6 billion persons by 2030. Traditional biomass is particularly used in developing countries (Yamamoto, Sie, Sauerborn, 2009). This high level of usage of fuelwood is completely not environmentally friendly due to its negative impact on atmospheric and people's lives (Nyankone, 2016).

Most of the United Nations Sustainable Development Goals (SDGs) are anchored around energy access and utilization. There is a relationship between energy utilization and poverty as has been shown in the energy ladder theory. Household wealth is directly related to the ability to access and utilize cleaner energy sources. The target to end hunger cannot be attained without sustainable farm practice as agriculture is the single largest employer in the world. Increased dependence on biomass fuel has led to

the depletion of natural resources and soil fertility. The SDG goal of zero hunger among other things anticipates that by 2030, agricultural production and income of small scale farmers, especially women, indigenous peoples, family farmers, pastoralists and fishers would be doubled by ensuring secure and equal access to land, other productive resources and inputs, knowledge, financial services, opportunities for value addition and non-farm employment. Reports from the World Health Organization (WHO) ranks indoor air pollution from solid fuels as the world's eighth-largest health risk, causing 2.7 percent of global losses of a healthy life. Also, research has proved the existence of a relationship between biomass fuel use and lung cancer, a thirty-year-old woman cooking with straw or wood has an 80% increased the chance of having lung cancer later in life (Danlami *et al.*, 2015). In other to substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination; ensure universal access to affordable, reliable and modern energy services; provide women and girls with equal access to education, health care, decent work, and representation in political and economic decision-making processes; there is need to migrate from crude to refined energy sources. The objectives of the study include;

1. describe the socio-economic characteristics of the respondents
2. ascertain the types of household energy used by the respondents
3. determine the extent of awareness of the SDGs by the respondents
4. evaluate respondents perception of the effect of their energy use on the realization of the SDGs.

Methodology

This study was carried out in Imo State, Nigeria. The state has a population of 3,934,899. The population for this study comprised of all rural households in the state. Two Local Government Areas and autonomous communities were selected from each of the three geographical zones. The final stage was the random selection of 10 households from each of the twelve autonomous communities which gave a sample size of 120 respondents. Data were generated from both primary and secondary sources and analyzed using descriptive and inferential statistics such as frequency distribution, percentage, mean and regression analysis.

Results and Discussion

Table 1: Distribution of respondents according to their socio-economic characteristics

S/No	Variables	Frequency	%
1	**Age (Years)**		
	15-25	**6**	**5.00**
	26-35	**9**	**7.500**
	36-45	**42**	**35.00**
	46-55	**24**	**20.00**
	56-65	**32**	**26.67**
	65-Above	**7**	**5.83**
	Mean		
2	**Sex**		
	Male	**64**	**53.33**
	Female	**56**	**46.67**
4	**Household Size**		
	1-5	**58**	**48.33**
	6-10	**50**	**41.67**
	11-15	**10**	**8.33**
	Above 15	**2**	**1.67**
5	**Level of Education**		
	No formal Education	**39**	**32.50**
	Primary	**38**	**31.67**
	Secondary	**33**	**27.50**
	Tertiary	**10**	**8.33**
6	**Estimated Annual Income (N)**		

10, 000 - 100,000	**10**	**8.34**
101, 000 - 200,000	**5**	**4.16**
201,000 – 300,000	**16**	**13.33**
301, 000- 400, 000	**65**	**54.17**
401, 000 – 500,000	**12**	**10.00**
Above 500, 000	**12**	**10.00**

Entries in Table 1 show that the majority (53.30%) of the respondents were male. This finding is in agreement with Izuogu and Ekumankama (2015) who opined that the majority of rural dwellers in Imo State are male. Gender affects the household decision on energy use as women are more often engaged in fetching firewood from the forest and farms. The marital status of the respondents shows that most of the respondents (70.83%) were married. The result also shows a high level of literacy among respondents as 67.50% of them had formal education. Education improves household decision making on energy use as well as their knowledge of the inherent benefits in the use of cleaner energy sources.

Figure 1 shows that the majority (87.5%) of the respondents used fuel for most of their domestic activities. While Danladi, Aondoyila and Humphrey (2016) had in a previous study opined that 91% of rural dwellers use fuelwood, Oyedepo (2013) reported that 51% of rural households in Africa depend on fuelwood for their domestic energy. Considering that reliability of an energy source is one of the major factors that affect household decision on energy utilization, the low level of utilization of electricity(10%) among respondents may be attributed to the absence of electric power supply in the rural areas as well as its epileptic nature when it is available. Solar power was utilized by 5.83% of the respondents. These figures show that the attainment of SDG goals which targets good health and well being, affordable and clean energy, sustainable cities and communities, climate action among others may be difficult among respondents in the study area.

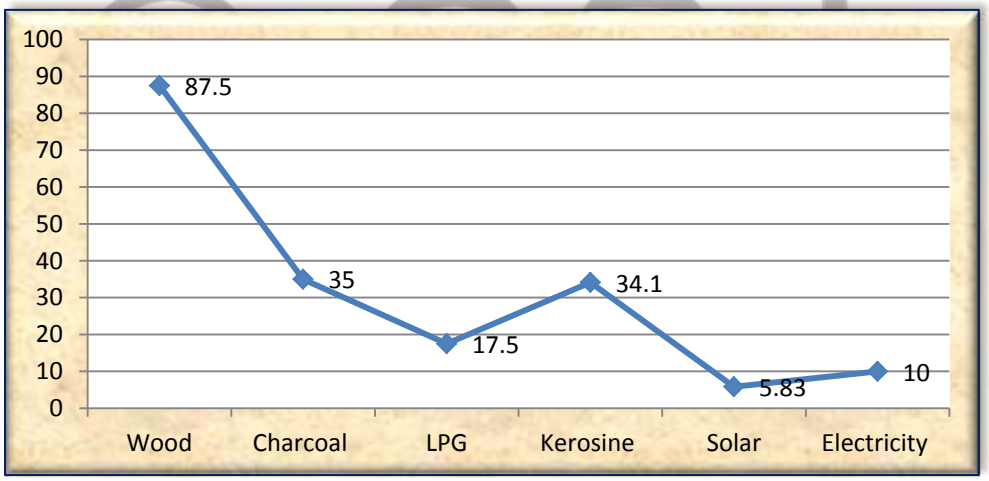

Figure 1: Respondents types of household energy

Figure 2 shows that majority (75.83%) of the respondents were not aware of the Sustainable Development Goals (SDGs). This may be attributed to a low level of awareness creation of the SDGs by both Governmental and Non Governmental organizations. Few studies have been carried out on the level of awareness of rural dwellers of Sustainable Development Goals

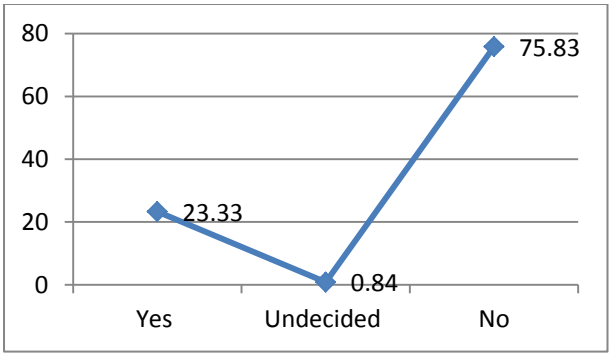

Figure 2: Respondents' knowledge of SDGs

Results presented in Table 2 shows that with a grand mean score ($\bar{x}$=2.49), respondents were not aware of the implications of their energy use on the attainment of SDGs. A mean score of ($\bar{x}$=1.70) shows that respondents were not aware that their energy use affects their agricultural productivity. The use of fuelwood increases the rate of deforestation which exposes the environment to the negative impacts of climate change such as soil erosion and leaching. This reduces the quality and quantity of nutrient that is available for plants to absorb. With this, agricultural productivity is reduced with its attendant negative effect on farmers' income. Respondents were also not aware of the fact that their energy use affects their education and health ($\bar{x}$=2.61), number of deaths from hazardous chemicals and air pollution ($\bar{x}$=2.47), female household members' time for recreational activities, nutrition and security ($\bar{x}$=2.64) etc. on the relationship between sources of household energy and education, Gerby (2014) reported that the use of fuelwood reduces the time children and females spend for schooling and study hours which consequently affects their academic performance. He opined that access to improved cooking fuels would have a paramount implication in solving these problems. Electricity is quite important for education as it encourages communication and assists to meet the basic needs of lightening which are vital for the teaching and learning process. Combustion of crude energy sources may expose the rural households to health hazards caused by environmental pollution

Table 2: Implications of energy use on attainment of SDGs

Question	Strongly Disagree	Disagree	Somehow agree	Agree	Strongly Agree	$\bar{x}$
Energy use affects participation in decision making	62 (51.67)	21(17.50)	14(11.67)	13(10.83)	13(10.83)	2.40
Energy use affects education and health	23(19.16)	58(48.33)	10(8.33)	18(15.00)	18(15.00)	2.61
Source of energy affects agricultural productivity of indigenous peoples.	76(63.33)	12(10.00)	12(10.00)	2(1.67)	9(7.50)	1.70
Energy use relates to the number of deaths from hazardous chemicals and air pollution	32(26.67)	44(36.67)	14(11.67)	23(19.16)	10(8.33)	2.47
Source of household energy affects access to education	47(39.17)	28(23.33)	22(18.33)	11(9.16)	18(15.00)	2.40
The cultural practice of using only women to fetch fuelwood amounts to gender inequality	45(37.50)	34(28.33)	23(19.16)	12 (12.00)	12(10.00)	2.30
Use of fuel wood will increase the emission of hazardous chemicals	24(20.00)	56(46.67)	12(10.00)	24(20.00)	22(18.33)	2.73
Energy use affects nutrition and security	42(35.00)	13(10.83)	14(11.67)	27(22.50)	15(12.50)	2.64
Energy use relates to the number of deaths from water contamination	39(32.50)	19(15.83)	19(15.83)	24(20.00)	22(18.33)	2.76
Energy use affects female household members' time for recreational activities	13(10.83)	43(35.83)	21(17.50)	21(17.50)	20(16.67)	2.93
Grand Mean ($\bar{x}$)						2.49

Note: Figures in parenthesis are percentages
Multiple responses were recorded.

Result from the Probit regression analysis as shown in Table 3 shows that education, income, access to extension and membership of co-operative were positively significant to respondents knowledge of SDGs. In a similar study by Izuogu, Ekweanya, and Ifenkwe (2015), they agreed that the more the respondents earned the more finance they had to spend on getting access to sources of information such as television, radio, print media etc. Access to these sources of information will invariably increase the level of knowledge of the respondents. Most rural dwellers are relatively poor especially when compared to their urban counterparts and Tchereni (2013) had reported that they regard LPG as a luxury which can be easily substituted by a combination of electricity and wood.

Education was significant and positively related to knowledge of Sustainable Development Goals. In a related study on the level of knowledge, Abdullahi and Amzat (2011) reported that the level of education significantly influenced knowledge positively. This implies that the more educated people are, the easier they find it to access information from different sources. Education as an aid for a living will invariably be significant to the knowledge of SDGs.

Probit Regression analysis on the relationship between socio-economic characteristics of respondents and knowledge of Sustainable Development Goals

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Education	0.368662	0.048253	3.619621***	0.0010
Marital status	-0.057023	0.013318	-0.43656	0.4730
Age	-0.012783	0.018721	-2.198161**	0.0142
Income	5.85E-04	2.77E-03	3.030276***	0.0000
Occupation	0.077353	0.015854	0.715821	0.3172
Sex	-0.08501	0.138586	-0.676990	0.3202
Access to extension	0.215619	0.071152	3.860697***	0.0002
Membership of Co-operative	3.750830	0.562331	4.138615***	0.0000
C	3.201241	0.785447	3.583519***	0.0001
LR statistic (10 df)	52.34411	McFadden R-squared		0.794581
Probability(LR stat)	7.00E-10			

Conclusion and Recommendations

It is difficult to leave a livable world to future generations if governmental organizations; non-governmental organizations established at local, regional, national and the international levels; the private sector, and people do not pay enough attention to issues relating to access and utilization of household energy. Results from the study show that a significant number of households depend on fuelwood and charcoal for their domestic energy consumption. . Among the different energy types that were under consideration, fuelwood is the most popular household energy type, followed by charcoal and kerosene. This study has shown that there is a wide gap in the target of ensuring the availability of cleaner, renewable and safer energy sources among rural households. The study recommends that more awareness should be created on the need for rural households to migrate from crude energy sources to cleaner energy sources towards the realization of the SDGs. Also, the government should aggressively pursue the provision renewable energy in the rural areas to reduce the pressure on the forest, minimize human activities that promote climate change and assist rural households in moving up on the energy ladder.

REFERENCES

Danladi, Y. B, Aondoyila, K and Humphrey, A.I (2016) Urban household cooking energy choice: an example of Bauchi metropolis, Nigeria. *Energy, Sustainability and Society.* DOI: 10.1186/s13705-016-0080-1

Danlami, A.H., Islam, R., Applanaidu, S.D (2015) An Analysis of the Determinants of Households' Energy Choice: A Search for Conceptual Framework. International Journal of Energy Economics and Policy Vol. 5, No. 1, 2015, pp.197-205 ISSN: 2146-4553 www.econjournals.com

Gebray Berhe Truneh (2014): Factors Influencing Household Cooking Energy Choice and Transition: Empirical Evidence from Mekelle City, Ethiopia. Master's Programme In Urban Management And Development

Irfan Mohsin (2011): Rural Energy Assessment And Potential Alternative Energy Resources & Technologies In Rural Areas Of Abbottabad, Pakistan. Master Thesis 30 credits 2011 Department of International Environment & Development Studies, Noragric

Izuogu C.U , Ekweanya N.M & Ifenkwe G.E (2015) : Assessment of Environmental Hazard effect on Agricultural Resources and Health Conditions of Rural Households in Imo State, Nigeria. Global Journal of Biology, Agriculture and Health Science. *G.J.B.A.H.S., Vol. 4(4):20-25 (October-December, 2015)* ISSN: 2319 – 5584

Izuogu, Chibuzo U and Ekumankama, Orji O (2015): Assessment of Rural Infrastructures and Productive Assets Provided by Fadama 11 Development Project in Okigwe Agricultural Zone of Imo State, Nigeria. *International Journal of Academic Research in Business and Social Sciences* June 2015, Vol. 5, No. 6 ISSN: 2222-6990

Lusambo L.P (2016) Household Energy Consumption Patterns in Tanzania. J Ecosys Ecograph S5:007. doi:10.4172/2157-7625.S5-007

Nyankone, Benson Ouma (2016) 1 Factors Influencing Choice of Sources for Domestic Energy Used in Households. Journal of Energy Technologies and Policy ISSN 2224-3232 (Paper) ISSN 2225-0573 (Online) Vol.6, No.7, 2016 in Thuti Sub-Location, Othaya

Oyedepo, S. (2013). Energy in Perspective of Sustainable Development in Nigeria. Sustainable Energy 1, 14-25.

Tchereni, B. H. M (2013): A Microeconomic Analysis of Energy Choice Behaviour in South Lunzu Township, Malawi. Mediterranean Journal of Social Sciences Published by MCSER-CEMAS-Sapienza University of Rome. E- Vol 4 No 6 , ISSN 2039-2117 ISSN 2039-9340

Yamamoto, S., Sie, A., Sauerborn, R. (2009). Cooking fuels and the push for cleaner alternatives: a case study from Burkina Faso. Global Health Action 2009.