

**ENVIRONMENTAL EDUCATION AND SUSTAINABLE ENERGY  
CONSUMPTION IN CALABAR METROPOLIS,  
CROSS RIVER STATE, NIGERIA**

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**Abstract**

This study examined Environmental Education (EE) as a pathway to sustainable consumption of energy in Calabar Metropolis, Cross River State, Nigeria. To achieve the purpose of this study, three research questions and hypotheses guided the study. The survey research design was adopted for the study. A sample of three hundred (300) respondents was purposively selected for the study. The selection was done through the simple random sampling technique. A 22 item 4 point modified Likert-type scale questionnaire was used for data collection. The Cronbach Alpha reliability ranging from 0.64 to 0.92 was used. Data collected were analysed at .05% level of significance. Based on the findings, it was recommended that environmental participation should be encouraged in Calabar Metropolis to ensure sustainable use of energy resources.

**Keywords:** Environmental Education, Sustainable Consumption, Energy, Calabar Metropolis.

**Introduction/Background**

Environmental Education (EE) is that learning process which deals with human inter-relationships with natural and built environment. In other words, it is education acquired from the daily interaction and experiences of events in the environment. EE is multi-disciplinary and is both formal and informal. It is a lifelong learning process which is learner centred and holistic. Learner centred in the sense that the learner is the focal point of the learning process and holistic because the different dimensions of the environment-bio-physical, economic, social, political, technological, transcendental and cultural aspects are considered. The focal point of EE is to develop learners who have awareness of the environment, concerned about it and its associated problems and which collectively aimed at providing sustainable solution to current environmental crisis and the prevention of new ones.

Sustainable consumption (SC) is the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials, as well as the emission of waste and pollutants over the life cycle of the service and product so as not to jeopardize the needs of future

generations (Schoon, Auckland & Riddlestone, 2015). According to Akenji and Bengtsson (2014), SC can be summarily viewed as having two broad and interrelated objectives which are; achievement of well-being for all people, and keeping negative environmental impacts of socio-economic activities to within the earth's carrying capacity.

At the Rio Earth Summit in 1992, world leaders accepted that the unsustainable pattern of consumption of resources is the major cause of the continued deterioration of the global environment (Ying, Mengru, Han, & Lingling, 2015). The role of sustainable consumption (SC) towards sustainable development was reaffirmed at the World Summit for Sustainable Development in 2002; SC was declared again one of the overarching objectives of, and essential requirements for sustainable development (Lewis & Magnus 2014). The inability of the millennium development goals to specifically address the issue of unsustainable consumption patterns led to the formulation of the sustainable development goals (SDGs) with Goal 12 specifically designed to address the issue. At the recent Rio+20 conference, a 10-Year Framework of Programmes (10YFP) was adopted by world leaders to enhance international cooperation and to support concrete regional and national initiatives towards SC in both developed and developing countries. In the formulation of SDGs, as mandated in the agreement from Rio+20, SC should therefore be placed as a high priority.

Promoting sustainable energy consumption requires improved understanding of consumer behaviour and attitudes. Consumers have different needs with respect to information and their potential to be influenced by instruments and tools varies. Most consumers have positive but passive view of sustainable energy consumption. Policy tools and instruments may need to be targeted to different types of households, individuals or groups. Many factors including income, age, location, biases, attitudes and gender influence energy consumption. One of the most important factors influencing sustainable energy consumption is income, with wealthier households far more likely to go for solar and wind power energy. Wealthier households also engage in higher levels of energy consumption; as people get richer, they increase their stocks of electrical appliances, food purchases, number of cars, frequency of vacations, and generation of waste. People with low income may lack the resources to invest sustainably, although they are no less willing in principle to take responsibility for their actions than better-off consumers (Organisation for Economic Cooperation and Development (OECD, 2008).

Mandatory government actions to promote sustainable consumption include performance standards and mandatory labels to limit damages from products when they are consumed or used. In terms of changing consumption patterns, these tools are the most direct policy instruments for eliminating unsustainable products from the market. As the range of consumer concerns widens, governments are being called on to regulate more products in the interest of the environment and general welfare of the citizenry.

In the face of prevailing environmental crisis as a result of human energy consumption patterns, scientists have propounded theories towards ensuring sustainable ecosystem but to no avail. The United Nations decided to adopt the teachings of EE as an acceptable and realistic mechanism where upon the increasing environmental problems can be put under control (Enu, 2005). EE is seen as a pathway to achieve sustainable energy consumption which is an important aspect of sustainable development. There are different strategies in EE through which sustainable energy consumption can be achieved.

One of the strategies is through the creation of awareness and concern about the environment, socio-economic and political interdependence in urban and rural areas. In Calabar Metropolis and its environs, environmental awareness is growing but a lot of

work still needs to be done if sustainable energy consumption is to be achieved because from prehistoric times, humans have been regarded as superior to all creatures. Humans have not only been thought to be in charge of the earth and all creation therein but also seen as apart from the environment instead of being a part of it. This pre-dominant world view called anthropocentrism sees the earth as a free gift which must be exploited to meet human consumption needs of food, water, clothing, energy, building materials, construction materials among others. This of course has led to excessive pressure on environmental resources which have resulted in environmental degradation instead of environmental sustainability (Omoogun, 2009).

The task of achieving sustainable consumption at national or global level hinges on a thoroughly planned and effectively executed programmes of education. The education programmes should not only focus on those that fall within school age but should incorporate the largest possible section of the society including political leaders, policy makers and indeed, the entire society just like what EE is doing (Lawal, Aniah, Uche, Animashaun & Anijaobi, 2010).

Environmental knowledge is more than having simple environmental awareness due to the depth of information and the experience, which one has to make a person understand the relationship that exist between human life and the environment. Environmental knowledge is the comprehensive understanding of one's physical environment, which arises because of synthesizing all the information which a person possesses (Hares, Eskonheimo, Myllyntaus & Luukkanen, 2006). This knowledge is acquired through self-learning experiences that are heavily influence by historical, cultural, ecological, socio-economic and other circumstances. An individual who have knowledge of the environment can disseminate such information through writing and teaching on how the environment can be sustainably used to maintain its quality. Thus, having environmental knowledge is something which could be manifested in one's behaviour and not just a set of conceptions, which exist in one's mindset. People's energy consumption patterns on the one hand and the sustainable use of the environment on the other hand depends mainly on the knowledge of the environment and level of awareness, belief system, cultural disposition, religious affiliation among others (Atte, 2010). Knowledge for the physical environment is at the heart of the solution to the current ecological crisis that has worsened infrastructural facilities in urban centres and under an acute shortage of land and food thereby aggravating unsustainable consumption patterns.

The essence of having environmental knowledge perhaps is due to the contemporary environmental crises such as over-population, over consumption of resources without ethical measures thereby causing a deteriorating effect in the environment. Having a high knowledge and understanding of how human, natural and physical processes works could change behaviour to tend more towards conservation of the environment and sustainable energy consumption. Inadequate knowledge about sustainable energy consumption could be barriers towards ensuring that people continue to degrade the environment without thinking that it needs to be sustainably conserved for future generations (Bickford, Posa, Qie, Campos-Arceiz & Kudavidanage, 2012).

The Rio Summit in 1992 produced Agenda 21. This international treaty developed a strategy for addressing sustainable development throughout the world by calling for increase participation of everyone in addressing environmental, social, and economic concerns that affect their community. The importance of providing the populace with opportunities to participate in environmental issues such as limiting the emission of carbon dioxide in the atmosphere, environmental outdoor activities like field trips, site seeing and excursion, planting of trees and encouraging family planning are

seen as valuable components in educational reform. Environmental education has the potential to empower learners with direct, hands-on experiences for its participants. Active youth participation that focuses on issues and their resolution gives first-hand experience and understanding about the environment, and develops the skills to actively study, acquire sustainable energy consumption patterns and contributes significantly to sustainable development (Toili, 2007).

In order to effectively address unsustainable energy consumption patterns, different types of environmental initiatives have been implemented. Torkar (2014), distinguished between private and public environmental actions and participation. Environmental education has traditionally promoted private pro-environmental behaviour, where individuals consume fewer resources by using technological innovations such as energy efficient appliances and alternative behaviours such as using public transport or by reducing consumption of resources example, reduction in purchasing (Clayton & Myers, 2009). Each individual must decide in order to change their behaviour, but changes must also occur on a broader level in order to have a significant environmental impact. It will make little impact if human beings have environmental awareness and knowledge without actually participating and taking action where necessary to address the myriad of environmental problems including unsustainable energy consumption. That is why there is a call for everyone to think globally and act locally in ensuring suitable energy consumption.

### **Statement of the problem**

In the hunter-gatherer and agrarian societies, humans mainly depended on the use of renewable resources such as fruits, wood and sun. Then, the consumption of resources was minimal and had little or no negative environmental impact. As human population grows, and couple with the quest for wealth creation, humans started using unsustainable technologies like hydro-energy power, coal, thermal electricity, firewood, burning of fossil fuel for daily energy consumption. This exploitation wrought accelerated negative impacts on the environment.

The population of Calabar is growing and the consumption of food, water and energy resources have already risen rapidly. An average Oceania and American consumes around 100kg per day and 90kg per day respectively. As the residents of Calabar becomes more like the Oceanians and Americans in energy consumption-cooking, dry-cleaning, transport, powering home appliances, not switching off light bulb during day hours, powering factory and industrial machines and so on, excessive pressure is already placed on energy resources and infrastructure to meet this inordinate consumption desires. This precursor will add to the other unsustainable consumption pattern which is the mother of all human-induced environmental crises.

Unless something is urgently done to check this unsustainable energy consumption patterns, it might get to a level where it becomes increasingly difficult if not impossible for future generations to have a fair share of these finite resources. The problem of the study is therefore an attempt to evaluate this inordinate consumption of energy resources in the locality in line with Sustainable Development Goal 12 if they are moving in the same direction. This is done in view of highlighting certain grey areas so as to contribute towards proffering sustainable ways of energy consumption in the area under study.

### **Purpose of the study**

The purpose of the study is to examine EE as a pathway to sustainable consumption of energy resources amongst residents of Calabar Metropolis. Specifically, this study intent to;

- i. Ascertain whether the level of environmental awareness influence sustainable energy consumption in Calabar Metropolis.
- ii. Investigate if environmental knowledge influence sustainable energy consumption in Calabar Metropolis.
- iii. Determine whether participation in environmental activities influence sustainable energy consumption in Calabar Metropolis.

### **Research questions**

- i. How does environmental awareness influence sustainable energy consumption amongst residents of Calabar Metropolis?
- ii. How does environmental knowledge influence sustainable energy consumption amongst residents of Calabar Metropolis?
- iii. To what extent does participation in environmental activities influence sustainable energy consumption amongst residents of Calabar Metropolis?

### **Research hypotheses**

- i. Environmental awareness does not significantly influence sustainable energy consumption amongst residents of Calabar Metropolis.
- ii. There is no significant influence of environmental knowledge on sustainable energy consumption amongst residents of Calabar Metropolis.
- iii. Participation in environmental activities does not significantly influence sustainable energy consumption amongst residents of Calabar Metropolis.

### **Methodology**

#### **Design**

The design adopted for this research is the survey design, which involves the collection of data to accurately and objectively describe phenomena in the current time and the focus is to ascertain facts. The researchers adopted the survey method because the work is aimed at examining EE as a pathway to sustainable consumption of energy resources as it applies at the time of carrying out this research.

#### **Area of study**

Calabar Municipality lies between latitude  $04^{\circ} 15'$  and  $5^{\circ}$  N and longitude  $8^{\circ} 25'$  E. In the North, Calabar Municipality is bounded by Odukpani Local Government Area, in the North-East by the great Kwa River. Its Southern shores are bounded by the Calabar River and Calabar South Local Government Area. It has an area of 331.551 square kilometres. The study area has 10 wards. Ward 1 to 10

([www.kekerete.tripod.com/CRSG/calmun.html](http://www.kekerete.tripod.com/CRSG/calmun.html)) 2017

Majority of the people who reside in the study area speak Efik language. The Efik and the Qua have rich cultural heritage. The similarities in the culture of the people of Calabar Metropolis are traced to such areas as their common use of secret societies like Mgbe and Ekpe (mostly by the Efik/Qua) as instruments for the enforcement of traditional authority.

**Population**

The population of this study comprises civil servants, students, farmers and traders residing in Calabar Metropolis, Cross River State. The target population for the study is 4,570 from 4 wards out of 10.

**Sample**

The sample for this study is three hundred (300) respondents with a total of 12.1 % in a population of 4,570 which consists of civil servants, students, farmers and traders selected from Calabar Metropolis.

**Sampling technique**

A multi-stage sampling procedure was adopted for this study, involving purposive and simple random sampling techniques. The first stage involved the use of purposive sampling technique. Ward 1 to 4 were purposively selected out of the 10 wards in Calabar Metropolis, this was because, the selected wards happen to be the centre of business attraction, students residents, civil servants and farmer. The simple random sampling technique using the hat and draw method was used to sampled 300 respondents in the 4 wards in the second stage.

**Instrumentation**

The instrument used for data collection was the questionnaire. The questionnaire contained two sections. Section 1 contained items on respondent's demographic data while section 2 contained items measuring environmental awareness, environmental knowledge, participation and sustainable energy consumption. A closed-ended questionnaire was designed with response options; SA stand for strongly agree which attracted 4 points, A stand for agree which attracted 3 points, D stand for disagree which had 2 points and SD stand for strongly disagree which attracted 1 point only for all worded items that are positive. For worded items that are negative, the researchers reversed the scoring.

The researchers developed the instrument and were validated by two experts in measurement and evaluation. The researcher ensured that the items chosen for inclusion in the instrument have potential to get objective responses from respondents. In order to estimate the consistency of the instrument, Cronbach Alpha coefficient was employed to test the instrument and its constructs. A pilot test was conducted on fifty (50) respondents who were not part of the sampled respondent. Alpha coefficients ranging from .64 to .92 was obtained for the instrument's constructs. This shows high level of reliability of the instrument.

**Method of data analysis****Hypothesis One**

There is no significant influence of the level of environmental awareness on sustainable energy consumption in Calabar Metropolis.

**Table 1. Summary data and one-way ANOVA of the influence of the level of environmental awareness on sustainable energy consumption (N=300).**

Age	N	X̄	SD		
Low	5	2.40	.894		
Medium	8	2.25	1.035		
High	17	2.17	.809		
Total	30	2.23	.858		
Source of variance	SS	Df	Ms	F	Sig of F
Between group	.196	2	.098	.125*	.883*
Within group	21.17	27	.784		
Total	21.37	29			

\* Significant at .05 level

The result on table 1 revealed that the mean for low level of awareness as regards sustainable consumption is 2.40, SD .894, medium level of awareness mean stands at 2.25, SD 1.035 while high level of awareness means stands at 2.17, SD .809. The calculated Sig F-value of .883 is higher than .05 level of significance with 2 degree of freedom. The result of the analysis was not significant since the Sig f-value of .883 is higher than the significant value at .05. With this result, the null hypothesis which states that, there is no significant influence of the level of environmental awareness on sustainable consumption in Calabar Metropolis was retained while the alternate hypothesis was not accepted. This implied that, the level of awareness creation as regards sustainable consumption of energy in Calabar Metropolis is not statistically significant.

**Table 2: Summary data and one-way ANOVA of the influence of the level of environmental knowledge on sustainable energy consumption (N=300).**

Age	N	X̄	SD		
Low	5	2.60	.894		
Medium	8	2.12	.834		
High	17	2.47	.624		
Total	30	2.40	.723		
Source of variance	SS	Df	ms	F	Sig
Between group	.890	2	.445	.839*	.443*
Within group	14.31	27	.530		
Total	15.20	29			

\* Significant at .05 level

The result on table 2 revealed that the calculated Sig F-value of .443 is higher than .05 level of significance with 2 degree of freedom. With this result, the null hypothesis which states that the level of environmental knowledge does not significantly influence sustainable energy consumption in Calabar Metropolis is retained.

**Table 3: Summary data and one-way ANOVA of the influence of the level of participation in environmental activities on sustainable energy consumption (N=300).**

Age	N	X	SD		
Low	5	1.60	.548		
Medium	8	2.50	.756		
High	17	2.52	.624		
Total	30	2.37	.718		
Source of variance	SS	Df	ms	F	Sig
Between group	3.53	2	.1.77	4.17*	.026*
Within group	11.43	27	.424		
Total	14.97	29			

\* Significant at .05 level

The result on table 3 revealed that Sig value of .026 is lower than the significant value at .05. The null hypothesis which state that the level of participation in environmental activities does not significantly influence sustainable energy consumption is in Calabar Municipality is rejected because Sig value of 0.026 is less than the significant value at 0.05 level of significance. This means that the level of participation in environmental activities in Calabar Municipality significantly influence sustainable energy consumption.

### Discussion of findings

The result of the first hypothesis indicates that there is no significant influence of environmental awareness on sustainable energy consumption. The result of this hypothesis is in line with the work of United Nations Development Programme (2006) that consumption options are most times not affected by factors like education and health care among others.

The result of the second hypothesis indicates that there is no significant influence of environmental knowledge on sustainable energy consumption. The result of this hypothesis is in line with the findings of Atte (2010) which states that sustainable energy consumption patterns do not depend on the knowledge of the environment and level of awareness, belief system, cultural disposition and religious affiliation.

The result of the third hypothesis indicates that there is a significant influence of environmental participation on sustainable energy consumption. The result of this hypothesis is in line with the findings of Clayton & Myers (2009) which states that individuals consume fewer resources by using technological innovations such as energy efficient appliances and alternative behaviours such as using public transport or by reducing consumption of resources example, reduction in purchasing of goods and services.

### Conclusion

In conclusion, sustainable energy consumption implies a broad societal change which requires a systematic approach to human development based on ecological, social and economic dimensions; in a world of limited resources sustainable energy consumption is an essential requirement for sustainable development. Energy consumption processes need to be decoupled from escalating resource use and environmental degradation.

## Recommendation

Based on the findings of this study, the researchers recommend that

- (i) Environmental participation should be encouraged in daily living in Calabar Metropolis to ensure sustainable use of energy resources.

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