

## ENVIRONMENTAL EDUCATION STRATEGIES AND WILDLIFE RESOURCES CONSERVATION IN CALABAR EDUCATION ZONE, CROSS RIVER STATE, NIGERIA

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### ABSTRACT

This study examined Environmental Education strategies on wildlife resources conservation in Calabar Education Zone, Cross River State, Nigeria. To achieve this aim, two null hypotheses were postulated. Related literatures to the variables under study were reviewed. Descriptive survey research design was adopted for the study. Since this design involves the collection of data to accurately and objectively describe existing phenomenon. It was considered most appropriate for the study as it will permit inferences and generalisation after thoroughly describing the variables for the present population. The researchers adopted multistage sampling procedure to select the sample for this study. The major instrument for data collection was a survey questionnaire titled “Environmental Education Strategies and Wildlife Conservation Questionnaire” (EESWCQ). Data collected were subjected to statistical analysis using descriptive frequency and simple linear regression analysis. The findings of the study revealed that there is a significant influence of social media awareness creation, agricultural extension services on wildlife resources conservation in the study area. It was therefore recommended among others that relevant stakeholders should ensure that social media awareness creation does form a core environmental awareness strategy that would be relied on to promote farmers/hunters wildlife resources conservation in the study area.

**Keyword:** Environmental Education, Strategies, Wildlife Resources, Conservation, Calabar Education Zone.

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## INTRODUCTION

History has it that the relationship that existed between man and forest wildlife in the past was cordial. In recent times, the trend is reversed. The plants and animals are harvested to near extinction and man is found to be the main culprit. Man is the earth's worst predator and in his attempt to survive, a large number of plants and animal species are endangered. They face the threat of extinction while some are already extinct.

Wildlife among other natural resources has attracted both national and international conventions. The International Council for Science (ICS) in partnership with the International Social Science Council (ISSCO) (2015) highlighted the sustainable development goals 15 (SDGs) as a bench mark for all citizens regardless of nationality, which states "To protect, restore and promote sustainable use of terrestrial ecosystems, to sustainably manage forests, combat desertification to halt and reverse land degradation and halt biodiversity loss". The SDGs 15 is geared towards promoting the sustainable management of forest ecosystem from 2015 to 2030. According to Offiong et al. (2014) in Essien et al. (2020) forest are homes to countless plants and animals that are vital elements of our life support system.

Stressing further, Unimtiang (2019) opined that forest is categorized as the entire assemblage of organisms such as trees, shrubs, herbs, bacteria, fungi and animals (wildlife) including people together with their environmental substrates (the surrounding air, soil, water, organic debris and rocks), interacting inside a defined boundary. The importance of wildlife according to Offiong et al. (2014) in Essien et al. (2020) goes beyond the provision of physical needs of human; to exact tremendous impact on our environment such as reduce extreme heat or cold air which is essential for human existence and fertilizes the forest that serves as carbon sink absorbing toxic gases emitted from industries and other human anthropogenic activities.

According to Udumo et al. (2018), despite the importance of forest and wildlife in ensuring livelihood, the management of wildlife resources is a concern to the world. Wildlife management is essential due to the unique ecological and socio economic roles it plays to those who depend on it. Forest wildlife management is a branch of forestry concerned with overall administrative, economic, legal, and social aspects such as silviculture, protection and forest regulation. Forest and wildlife management cannot succeed unless it is linked to opportunities and activities targeted at those whose pursuit of livelihood threatens the viability of the ecosystem. In Cross Rivers State, especially in Calabar Education Zone, forest and wildlife management is anchored on different land uses such as creation of protected areas or landscapes which are, forest reserves, national park and wildlife sanctuaries. The management of forest wildlife relies solely on the level of educational attainment, literacy level, and awareness among others.

Forest and wildlife exploitation is one of the largest threats that are being faced by Cross River State and Calabar Education Zone today. The United Nations International Strategy for Disaster Reduction characterizes forest exploitation as the lessening of the limit of the earth to meet social and forest destinations, and needs. Forest and wildlife exploitation can happen in a number of ways. At the point when forests environments are wrecked or common assets are exhausted, the forest environment is considered to be corrupted and harmed (FAO, 2023). Forest issues can be seen by long term ecological effects, some of which can demolish whole environments (climate change). A forest is a unique unit and incorporates all the living and non-living components that live inside it. Plants and animals (wildlife) are evident parts of the forest

environment, but it also includes the things on which they depend on, for example, streams, lakes, and soils. The forest is to be protected without compromise from all stakeholders.

According to the Food and Agriculture Organization of the United Nations (FAO, 2023) in Unimtiang (2019) despite the sustainable wildlife management practices put in place in Cross River State; in 2022 Cross River State had the highest rate of deforestation in the world. In 2005 12.2%, the equivalent of 11,089,000 hectares had been deforested in Nigeria. Between 2000 and 2023, Nigeria lost an average of 409,700 hectares of forest every year equal to an average annual deforestation rate of 2.38%, between 2005 and 2019, in total Nigeria lost 35.7% of its forest cover, or around 6,145,000 hectares (Unimtiang, 2019; FAO, 2023).

Environmental Education strategies and wildlife conservation encompasses approaches, tools and programs that develops and support environmentally related attitudes, values, awareness, knowledge and skills that prepare people to take informed action to save the environment. Environmental Education is concerned with those aspects of human behaviour which are more directly related to man's interaction with the bio-physical environment and its ability to understand this interaction. Environmental Education is an important tool in natural resources conservation. Environmental Education strategies are a subject that combines science, policy and socio-economic applications. It primarily stresses on finding solutions to practical problems that people face in cohabitation with nature, resource exploitation and waste production.

Environmental Education is widely considered the most appropriate tool with which to raise awareness concerning environmental problems and to promote changes in habits and behaviour that are detrimental to the environment. Environmental Education is a conservation strategy that creates such synergistic spaces, facilitating opportunities for scientists, decision makers, community members and other stakeholders to converge (Ernest & Monroe, 2014). The role of Environmental Education in general education is to provide a systematized structure capable of developing critical participatory, transformative and emancipator education that encourages, enables and empower participating subjects to be responsible and have both the desire and where with all to promote environmental ethics and citizenship. Environmental Education provides the methods and content that can lead to environmental literacy and a more sustainable future. Through Environmental Education, people develop new habits of analyzing and interpreting skills, improved knowledge of environmental process and systems skills for understanding and addressing environmental issues and personal and civic responsibility. Education develops an environmentally literate citizenry that makes choice that are better for the health of the environment, leading to a more sustainable planet (Ernest & Monroe, 20014; Unimtiang, 2019).

Cross River State wildlife is remarkable for its abundance and diversity. The variety of wildlife and the unique habitats attract tourist and wildlife enthusiasts to the State. In Calabar Education Zone wildlife has traditionally been regarded as a valuable community asset, and has been protected by customs, taboo and government laws. Contemporary valuing of wildlife occurs for economic, ecological, medical, educational, scientific, recreational and intrinsic reason. Wildlife provides employment and contributes to the national incomes of Nigeria through earnings from wildlife tourism and the sale of wildlife products. It plays an essential role on Nigeria's savannahs, contributing to diversification of ecosystems, reduction of bush land and expansion of grasslands. In efforts to conserve the diversity of free-ranging animals, the dominant colonials' strategy for wildlife management was the creation of protected areas. In terms of this strategy, several approaches were used to conserve wildlife by separating humans

and wildlife. They entailed the creation of protected areas, the prevention of consumptive use and the minimization of other forms of human impacts (Adams & Hulme, 2019).

According to the International Union for the Conservation of Nature (IUCN) (2000) and Dudley et al. (2018) a protected area is a clearly geographical space, recognized, dedicated and managed through legal or other effective means to achieve the long-term conservation of nature with associated ecosystem services and cultural values. Protected areas aimed at wildlife management include national parks, game reserves and ranches. The creation of protected areas was seen as an ethical obligation to future generations to prevent non-human species loss through human action (Dudley et al., 2018).

The idea of sustainable development and management of wildlife is government oriented, while sustainable living is that everyone is able to judiciously manage the natural resources in a way that maintains the biodiversity, productivity, regeneration capacity and their potential to fulfill the present and future generation needs. Sustainable living in itself is a function of environmental conservation. This involves training of personnel through workshops, seminars and communication strategies such as conservation clubs, community awareness, electronic media, print media, community sensitization as well as practical way of handling the environmental resources sustainably (Ikpeme, 2017; Essien et al., 2020).

The natural environment is of great importance and it requires no emphasis by us as human beings. It is the only planet in the universe where life is known to exist. Human beings as culture building animals, made possible by their very highly evolved brains, undertake different forms of learning to attain increased control of the environment. This learning which could be self-directed, as individuals or groups, motivates man to impact upon the living environment as he attempts to explore, exploits and expropriate the natural resources of the environment to serve his needs. As human activities goes on inestimably, a lot of pressure becomes exerted on the carrying capacity of the living environment. Careless and over exploitation of the wildlife seems to focus on meeting the needs of today without providing for the requirements of our future generations. The result is that future generation face the threat of environmental degradation and its consequence (Onnoghen et al., 2023).

However, findings revealed that Environmental Education strategies and forest wildlife resources conservation include social media awareness crusades, community awareness creation, conservation clubs, and mass media. Hulme (2012) presented evidence from their research showing that shifts to community conservation have generally been beneficial in aggregate terms of communities relative to pre-existing regimes of protected area management and social media crusading. The community conservation strategies have also made official conservation policy marginally more acceptable to rural people in Cross River State, and are said to be a step in the right direction. Hulme (2012) in Onnoghen et al. (2023) cite evidence from their case studies which could shape the behaviours of local residents in patterns that are more compatible with conservation goals. These need to be encouraged through the social media for improved wildlife conservation.

UNDP (2017) in Essien et al. (2020) also pointed out that there is need to make farmers sensitive towards nature through a strong programme (mass media, agricultural extension services, social media, government policies, community based organizations, newspapers, textbooks etc.) of wildlife preservation and how to conserve forest resources. Environmental Education strategies on wildlife conservation involves creating knowledge, understanding and values, attitude, skills and abilities through mass media, agricultural extension services, social media, government policies, community based organizations, textbooks, journals, newspapers,

and more among individuals and social groups towards the issues of sustainability for attaining a better quality environment.

Universally, agricultural extension role is educational. Extension officers are expected to provide and disseminate information to farmers and residence. Other services expected of extension officers, in their role and responsibilities, include providing institutional support and facilitating farmer's needs to support agricultural production. Several models of extension exist in enabling extension services to be more clients oriented. In all of these models, government policy is considered important. According to Igodan (2016), extension workers must be involved in monitoring and evaluation of the performance of farmers in development of projects. It should also be emphasized that agricultural extension enhances the efficiency of making adoption decisions.

### **Statement of the Problem**

Forest and wildlife resources are exploited at much faster rates than ever before. This is evident in the rate of forest cover change between 2015 to 2023 in Cross River State (FAO, 2023). These unprecedented losses in forest have no doubt impacted on the biodiversity and livelihood of the forest communities. The major drivers of the mismanagement of forest resources both timber and non-timber forest products is attributed to increased economic activities characterized by population growth, accelerated urbanization trends, agricultural products, logging, hunting and other forms of forest resource exploitation. According to FAO (2023) it is estimated that Nigeria destroys around 600,000 hectares of her forests year in year out as a result of indiscriminate destruction and that "Nigeria's forests are threatened as the forest cover declined from approximately 24 million hectares in 1976 to 15 million hectares in 1995 and down to 7.4 million hectares in 2020."

The rapid depletion of these resources through human activities especially in the forest areas led to the participation of Nigeria in major international initiatives, and became a signatory to a lot of treaties, protocols and conventions like the UN Conference on the Human Environment, Stockholm Report 1972, Belgrade Charter 1975, Tbilisi Report 1977, Brundtland Commission of 1983 and Agenda 21 of Rio Declaration 1992 to name a few. The United Nations Conference on Environment and Development held in Rio de Janeiro, Brazil in 1992, popularly known as the Earth Summit, also adopted an action plan for Sustainable Development, Agenda 21. The Nigeria government, through the Federal Ministry of Environment (FMENV) and other relevant agencies has made efforts to educate the public on environmental issues using Community based organizations, workshops, public enlightenment campaigns among other.

But the uncontrolled destruction of wildlife continues to increase despite the enlightenment campaign against unsustainable use of ecological resources. The animals are attacked through hunting, indiscriminate shooting of different species and sizes of wild animal thus, reducing the number of the animal and other wildlife drastically. The world is now so tied together by the flow of energy, information and commodities; that action in one part of it, is likely to have implications for many other parts.

Numerous biological resources, particularly wildlife and forests are being depleted more by foreign demand than by direct local consumption. Money earned by depleting resources in them often invested in imported industrial products, which themselves may have had a negative environmental impacts in the country of their production. Solutions to conservation problems must address both overt symptoms such as disappearing forests, and the more fundamental issues

underlying the symptoms such as human overpopulations and profligacy. Whether conservation action is aimed overall strategies are required to establish a common base of information to define the problems in ways that will lead to their solutions.

Despite the relevance of wildlife to the maintenance of a healthy environment, much harm has been done to the wildlife; unbridled logging, bush burning, overgrazing, hunting and mining among others, are common in the study area and these unsustainable environmental practices tend to endanger the existing wildlife resources in the area. The resultant effects of these unsustainable practices include climate change, global warming, drought, loss of biodiversity, loss of fertile land required for improved food product. The researchers ponders what could be the channels to propagate the sustainability of wildlife resources in Calabar Education Zone? Could Environmental Education strategies influence wildlife exploitation and its conservation in Calabar Education Zone of Cross River State, Nigeria?

### **Purpose of the Study**

The main purpose of this study was to examine Environmental Education strategies on wildlife resources conservation in Calabar Education Zone, Cross River State, Nigeria. Specifically, the study seeks to:

- Investigate the influence of use of social media awareness on wildlife conservation in Calabar Education Zone.
- Ascertain the influence of use of agricultural extension services on wildlife conservation in Calabar Education Zone.

### **Research Questions**

In order to investigate the issues raised in the study the following research questions were posed to guide the study:

- How does use of social media awareness creation influence wildlife conservation in Calabar Education Zone?
- To what extent are the influences of agricultural extension services on wildlife conservation in Calabar Education Zone?

### **Hypotheses**

The following hypotheses were formulated to guide the study thus:

- Social media awareness creation does not significantly influence wildlife conservation in Calabar Education Zone.
- Agricultural extension services do not significantly influence wildlife conservation in Calabar Education Zone.

## METHODS

The research design adopted for this study was the descriptive survey research design. The area of this study was Calabar Education Zone in Cross River State.

The population of the study comprises all the farmers/hunters in Calabar Education Zone of Cross River State. There are seventy five thousand, eight hundred and twenty one (75,821) registered farmers/hunters in Calabar Education Zone according to Cross River State Ministry of Agriculture 2023. See table 1.

Table 1: Population of registered farmers in Calabar Education Zone of Cross River State

S/N	Local Government	Number of Wards	Sampled	Population		Total
				Male	Female	
1.	Akamkpa	11	2	7,318	9,308	16,626
2.	Akpabuyo	10	2	6,730	1,000	7,730
3.	Bakassi	10	2	7,334	9,610	16,944
4.	Biase	10	2	8,468	8,468	16,936
5.	Calabar Municipal	10	2	1,320	3,736	5,056
6.	Calabar South	12	2	4,702	1,109	5,811
7.	Odukpani	10	3	5,020	1,706	6,726
Total		73	15	40,884	34,937	75,821

Source: Cross River State Ministry of Agriculture (CRSMA, 2023)

Multistage sampling procedure was used to select the sample for this study. A stratified sampling technique was used to group the population under study into local government area and gender. Simple random sampling technique was used in the selection of wards in local government areas in Calabar Education Zone; purposive sampling technique was used to select the number of respondents in each LGA's in the zone while accidental sampling technique was used to administer the questionnaire for data collection.

The sample size was determined using Taro Yamane's formula (1973). The sample for this study consisted of 398 male and female respondents from fifteen (15) wards in Calabar Education Zone, Cross River State. The number of respondents selected was to obtain adequate representative samples of residents from each Local Government in the area under study. All the selected wards in the four LGA's selected were used to ensure equal representation in the study. (See Table 2).

The instrument that was used for data collection was a set of survey questionnaire called "Environmental Education Strategies and Wildlife Conservation Questionnaire" (EESWCQ). The questionnaire was divided into three sections A, B and C. Section A focused on the personal data of the respondents such as sex, age, local government area of respondent, educational qualification. Section B elicited information on the various Environmental Education strategies under studies while section C measures wildlife conservation among residents.

The instrument was given to two (2) experts in the Department of Environmental Education for scrutiny. To ascertain the reliability of the instrument, Cronbach alpha Coefficient statistic was used. The Cronbach alpha coefficient results showed a reliability coefficient range of 8.1-8.5 which indicated that the instrument is reliable enough to be used for this study. (See table 3).

Table 2: A representation of percentage sampled from each wards and LGA's in Ikom Education Zone of Cross River State

S/N	LGA's	Population		Total	Total number of wards	Wards sampled	Respondent sampled per LGA	Percentage sampled %
		Male	Female					
1.	Akamkpa	7,318	9,308	16,626	11	2	130	1
2.	Akpabuyo	6,730	1,000	7,730	10	2	69	1
3.	Biase	8,468	8,468	16916	10	2	130	1
4.	Odukpani	5,020	1,706	6,726	10	2	69	1

Table 3: Cronbach alpha reliability estimate for the variable of the instrument (N=50)

Variables	Items	Mean	SD	$\alpha$
Use of Social media	5	17.36	3.92	.81
Agricultural extension services	5	17.72	3.41	.85
Wildlife conservation	10	31.21	4.24	.82

The instruments were administered on the sample group under the closed supervision of the researchers and research assistants. Three hundred and ninety eight (398) copies of questionnaire were administered, but three hundred and ninety five (395) were properly filled and returned. Simple linear regression and multiple regression statistical techniques were use in the analysis.

## RESULTS

The computed mean and standard deviation of the main variables is presented in Table 4.

Table 4: General Description of Variables

Variables	N	Mean	SD
Social media awareness creation	395	17.0076	1.21222
Extension services	395	16.7975	1.32124
Wildlife resources conservation	395	33.9038	2.14354

**Hypothesis One:** Social media awareness creation does not significantly influence wildlife conservation in Calabar Education Zone.

Table 5: Simple linear regression analysis of the influence of social media awareness creation on farmers/hunters wildlife resources conservation in Calabar Education Zone of Cross River State (N = 395)

Model	R	R <sup>2</sup>	Adj.R <sup>2</sup>	Std error of estimate	
1	.107	.011	.009	2.13401	
Source of variance	SS	Df	MS	F	Sig
Regression	20.629	1	20.629	4.530	.034
Residual	1789.715	393	4.554		
Total	1810.344	394			



The independent variable in this hypothesis is social media awareness creation while the dependent variable is farmers/hunters wildlife resources conservation. Simple linear regression statistical tool was used for data analysis. The result of this analysis is presented in Table 5.

The result of analysis presented in Table 5 showed that the predictor or independent variable (social media awareness creation) significantly influence the predicted variable (farmers/hunters wildlife resources conservation). The predictor variable accounted for 11.0% of the variance in farmers/hunters wildlife resources conservation in Calabar Education Zone of Cross River State. This showed a very insignificant relationship between the predictor and predicted variables.

Furthermore, the regression ANOVA revealed there was a weak significant positive influence of social media awareness creation on farmers/hunters wildlife resources conservation  $F(1, 393) = 4.530$ ;  $p < .05$ . Based on this result, it was revealed that if more intensive usage of social media awareness creations on wildlife resources conservation is organized in the study area, more farmers will adopt more and improved conservation measures that would enable them cope with the negative effects of wildlife resources extinction. This further stipulated that the lower the use of social media awareness creation, the lesser the conservation measures adopted by farmers in the study area.

The finding from analysis and testing of hypothesis one showed that the null hypothesis was rejected. This implied a significantly weak positive influence of social media awareness creation on farmers/hunters wildlife resources conservation in Calabar Education Zone of Cross River State. This could be because the level of social media awareness creation usage as a strategy for creating wildlife resources conservation awareness is low and the weak positive influence observed in the study is as a result of the few farmers that have engaged social media awareness creation on wildlife resources conservation. It is believed that the greater the usage of social media awareness creation applied the more positive conservative measures farmers in the study area will adopt.

**Hypothesis Two:** Agricultural extension services do not significantly influence wildlife conservation in Calabar Education Zone.

Table 6: Simple linear regression analysis of the influence of agricultural extension services on farmers/hunters wildlife resources conservation in Calabar Education Zone of Cross River State (N = 395)

Model	R	R <sup>2</sup>	Adj.R <sup>2</sup>	Std error of estimate	
1	.154	.024	.021	2.12053	
Source of variance	SS	Df	MS	F	Sig
Regression	43.165	1	43.165	9.599	.002
Residual	1767.180	393	4.497		
Total	1810.344	394			

Simple linear regression statistical tool was used for data analysis. The result of analysis presented in Table 6 showed that the predictor or independent variable (agricultural extension services) significantly influence the predicted variable (farmers/hunters wildlife resources conservation). The predictor variable accounted for only 24.0% of the variance in

farmers/hunters wildlife resources conservation in Calabar Education Zone of Cross River State. This showed a very strong relationship between the predictor and predicted variables.

Furthermore, the regression ANOVA revealed there was a moderate significant positive influence of agricultural extensive services on farmers/hunters wildlife resources conservation  $F(1, 393) = 9.599$ ;  $p < .05$ . Based on this result, it was revealed that the more the use of agricultural extensive services, the better the conservation measures they would adopt to cope with the harsh effects of wildlife extinction in the localities. Again, if the extension services decline, the conservation measures adopted by farmers/hunters will be less positive and unsustainable in the area of this study.

The finding from analysis and testing of hypothesis two showed that the null hypothesis was rejected. This implied a significant influence of agriculture extension services on farmers/hunters wildlife resources conservation in Calabar Education Zone of Cross River State. This could be based on the assumption that there are very low extension services provided for farmers in the study area or that most extension services do not cover wildlife resources conservation and its mitigation or adaptation measures. It is predicted that if the level of agriculture extension services increase, farmers will increasingly adopt positive conservation measures that would enable them cope with the effects associated with wildlife extinction.

## **CONCLUSION**

The study aimed at assessing Environmental Education strategies on wildlife resources conservation in Calabar Education Zone, Cross River State, Nigeria. The findings of the study revealed that there is a significant influence of social media awareness creation, agricultural extension services on wildlife resources conservation in the study area. From the above results, it is therefore concluded that there is a significant influence of Environmental Education strategies on wildlife resources conservation in Calabar Education Zone, Cross River State, Nigeria.

Changes in global wildlife resources structure have become increasingly obvious especially in the area of this study. The need for people especially the rural inhabitants to develop adaptation and/or conservative measures has become paramount in order to cushion the harsh effects associated with such changes. Wildlife resources extinction is seen as a consequence of poor human-environment interaction that has resulted in severe alterations in natural processes. This call for urgent step that would enable people cope with changes in forest ecosystem. Environmental awareness has been identified as a viable tool that can be utilized to sensitize and build capacity for wildlife resources conservation, adaptation and possible extinction mitigation measures.

It has therefore become an issue of utmost consideration among various stakeholders to brace up and empower the vulnerable with requisite support that would enable them cope with the effects experienced as a result of wildlife resources conservation regulations. This is because an uninformed or poorly informed individual lives in uncertainty and cannot save the wildlife resources from further exploitation and damage. Hence, the need to raise a citizenry that is aware of and capable of participating actively in solving environmental problem and preventing the occurrence of new ones at all times.

## **Recommendations**

Based on the findings obtained in this study, the following recommendations were made:

- Relevant stakeholders should ensure that social media awareness creation does form a core environmental awareness strategy that would be relied on to promote farmers/hunters wildlife resources conservation in the study area.
- Agricultural extension services should be expanded and intensified in the study area in order to enable farmers/hunters developed better and improved wildlife resources conservation measures.

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