



Impacts of Wildlife Conservation Education Effort on Selected Communities surrounding Kainji Lake National Park, Nigeria.

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Abstract. This study focused on the Impacts of Wildlife Conservation Education Effort on Selected Communities Surrounding Kainji Lake National Park was undertaken to derive information on the communities' level of knowledge and attitude as well as impact of education programs towards wildlife conservation in the area. The methodology employed in the study includes the use of structured questionnaire and oral interviews to acquire information from sampled members of the communities on the on the impact conservation education in their area. The data collected were analyzed using descriptive statistics- tables, charts and percentages. Non-parametric Chi-square χ^2 test was used to evaluate the significance of differences between data sets at 0.05 significance level. The results gathered revealed that majority of the respondents across the communities are aware of conservation education in their area. The chi-square test showed that the proportion of awareness is significantly different *($P < 0.05$) between those who are aware and those who are not. Participation in the conservation program influenced the behavior of members of the communities; it increases the peoples understanding of wildlife management with 98.66% across the community saying yes and 98.66% respondents declaring interest in wildlife conservation. Hence there is significant relationship between communities' level of knowledge and their impact on the protection and conservation of park resources. It is therefore recommended that government should create more awareness on wildlife conservation through education programs and workshops so as to help minimize illegal activities in the park.

Keywords: Impacts, Wildlife, Conservation Education, Communities, Kainji Lake National Park.

1. Introduction

One of the key success factors for sustainable conservation is the level of awareness and appreciation on the heritage value of the resources by stakeholders, particularly the local communities. Globally, a key challenge to achieving conservation goals is the need to capture the interest of local people in a manner that stimulates cooperation and positive conservation actions (Brewer 2002). An informed society or community will make wise decisions about protecting and preserving resources that define the very essence of their culture and society (Norzaini *et al.*, 2009). This awareness is crucial to the effective implementation of conservation strategies (Steinmetz *et al.* 2006).

Broadly speaking, the goals of conservation education and outreach programmes are to increase knowledge about wildlife and conservation issues, help form or strengthen pro-environmental attitudes among target audiences, and facilitate behaviours that ultimately protect wildlife (Kuhar *et al.*, 2010). There is need to pass on knowledge about the environment to future generations in order for communities to understand how to maintain a sustainable relationship with nature. That knowledge and understanding can empower community members, as grass roots participants, to make appropriate decisions for sustainable community development. Conservation education also aims to teach critical thinking skills that involve solving problems that affect communities. Educating the community, school children and key decision makers on the conservation challenges may enhance their ability to achieve long lasting and effective conservation and sustainability programmes (Norzaini, *et al.*, 2009).

While there is a large and growing literature evaluating environmental education and interpretive programs in developed countries (Carleton-Hug and Hug 2010;

Collado, *et al.* 2013; Skibins, *et al.* 2012), there are relatively few such studies in the developing countries including Nigeria.

The Nigerian National Parks and Kainji Lake National Park in particular is home to a large population of fauna and flora. There have been few evaluations of Conservation education programs and their impacts on communities' participants. This study helped assess changes in wildlife conservation knowledge, opinions, and behaviors among school children and communities around the park. Also, it helped to know how it has helped in the reduction of anthropogenic activities in the park and also help in the livelihood enhancement of the communities. The objectives of the study include: to assess communities' level of knowledge and attitude towards wildlife conservation and to assess the conservation impact of education programs in the study area.

1.1 Research Questions

This study addresses the following research questions:

- What is the community's level of knowledge about the park resources?
- What is the attitude of the communities towards the park resources?
- Does conservation education knowledge gained help in the protection and conservation of park resources?

1.2 Hypotheses

The following hypotheses guided this study:

- There is a significant relationship between communities' level of knowledge and their impact on the protection and conservation of park resources?
- There is no significant relationship between communities' level of knowledge and their impact on the protection and conservation of park resources?

1.3 Period and duration of work

A period of three months was used for data collection. The study was conducted between June 2022 and December 2022.

2. Research Methodology

2.1 The Study Area

Kainji Lake National Park is located between latitudes 9° 40'N and 10° 30'N and longitudes 30°

30'E and 50° 50'E. It lies at the extreme west of the wooded savanna region and in area generally referred to as the middle belt of Nigeria, characterized by relatively sparse population and abundant wild animals (Ezealor, 2002).

The park lies only 560km North of Lagos and only 385 to the northwest of the Abuja, the federal capital of Nigeria. The park covers a total area of 5340.82sq.km. It is made up of two non-contiguous sectors, the Borgu and Zugurma sectors. The Borgu sector lies astride the Borgu and Baruten local government area of Niger and Kwara states respectively and covers an area of 3,970.02sq.km. It is bordered in the east by the Kainji Lake and in the west by the Republic of Benin (Ezealor, 2002).

The Zugurma sector on the other hand, occupies a relatively smaller area of 1,370.80sq.km and is situated in the Mariga Local Government area of Niger state. This sector is bordered by Kontagora River on the Northwest side and by the Manyara River on the North side.

Within the park enclave are found the river basins the Nanu River which flows Eastwards to Timo River to join River Oli flowing into the River Niger which flows south ward. Also found is the Kainji dam with an altitude of 1237m above sea level, which harbours the Kainji Hydro Electric power spillway (Ezealor, 2002).

2.2 Climate

The two major features of the climates of the park are the division into wet and dry seasons and the variability from year to year. The wet seasons extends from May to October while the dry season extends from November to April. The mean annual rainfall of the Borgu sector varies from 1,100mm in the eastern part to 1,150mm in the Western part. The rainfall data for Zugurma sector shows that the sector receives a mean annual rainfall of about 1,167mm. Rain generally falls for 8 to 9 months of the year starting in March and ending in October or November (Ezealor, 2002).

2.3 Vegetation

The major vegetation type of the Kainji lake National park as classified by Keay in 1959 Northern Guinea Savanna Ecotype. Ezealor, (2002). also identified seven vegetation sub-types for the park. These are;

Burkia african / Detarium, woodland, Afzelia africana woodland, Isoberlinia tomentosa woodland, Terminalia macroptera woodland, Diospyros mespeliforms woodland, Acacia complex, Oli complex and Riparian forest.

2.4 Fauna Resources

Some of the fauna species found in the park includes;

Roan antelope, *Hippotamus- Hippotragus equines*, *Kob-Kobus kob*, *Serval cat-Felis serval* Ratel,

Honey badger-Mellivora capensis, *Hare-Lepus capensis*, *Green Monkey-Cercopithecus aethiops*, *African Manatee-Trichechus senegalensis*, *Lizard buzzard- Kaupifalco monogrammicus* Etc.

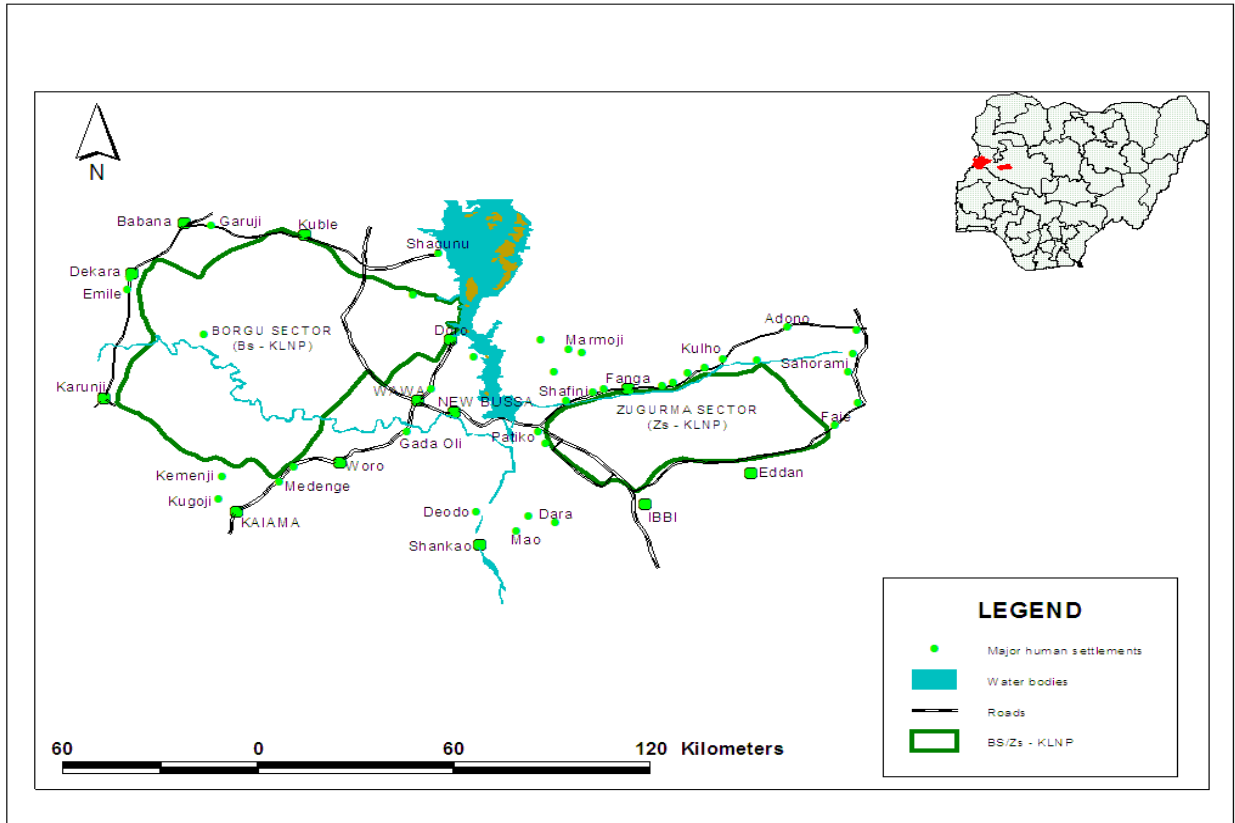


Figure 1. Map of KLNP showing the location of the study area

2.5 Study Design

Structured questionnaire and oral interviews was used to acquire information from sampled members of the communities’ surrounding Kainji Lake National Park on the impact conservation education in their area. Fifteen (15) respondents in five communities was randomly picked for the data collection. Therefore, a total of 75 respondents was randomly sampled for the study.

2.6 Data Collection Techniques

Data was collected using structured questionnaire and oral interviews to elicit information from sampled members of the communities on the impact conservation education in their area. A total of seventy-five (75) structured questionnaires was administered randomly to respondents in 5 selected communities in the study area namely, Zuguruma, Ibbi, Wawa, Paiko, Malale. Interviews were made with each respondent which include school children, adult man and women as well park staff. (who may have administered conservation education) Personal interviews involving key village informants and focus group discussions was carried out with selected community groups consisting of men and women. The study was conducted between July and October 2022.

2.7 Data Analysis

Descriptive statistics was used to analyze the data obtained. The statistics include; - tables, charts, and percentages. The personal interviews combine questions of a more quantitative, closed-ended nature with more qualitatively oriented, open-ended questions. The analysis was guided by the constructs and interview questions. Coding and interpretation of the results consist of reading and re-reading the narratives and noting emerging patterns related to local community understanding, experience as well as perceptions.

Non-parametric Chi-square χ^2 test was used to evaluate the significance of differences between data sets at 0.05 significance level.

3. Result and Discussion

Table 1 shows the socio-demographic characteristics of the respondents. The result gathered shows that the males (80%) were more than the females (20%). The age 15 – 25years recorded the highest (38.67%). Majority (73.33%) of the respondents were Muslims, while only 26.67% are Christians. Majority 57.33% had formal education, while a few (42.67%) did not go to any school. The major occupation of the respondents are farming (45.33%), followed by students (37.33%), while civil servant was the least (17.33%).

Table 1. Socio-Demographic of the Respondents

Variables	Frequency(n=75)	Percentage (%)
Gender		
Male	58	80
Female	17	20
Marital Status		
Single	50	73.33
Married	22	26.67
Age		
15 – 25	29	38.67
26 – 35	6	8
36 – 45	33	44
46 & Above	7	9.33
Religion		
Islam	55	73.33
Christianity	20	26.67
Level of Education		
No formal	32	42.67
Formal	43	57.33
Occupation of the Respondents		
Farmer	34	45.33
Civil servants	13	17.33
Student	28	37.33
Employment status		
Employed	28	37.33
Unemployed	47	62.67

Source: Field Survey, 2022

Table 2. , show the Awareness of Conservation Education in the study area, the result indicates that majority of the respondents across the communities are aware of conservation education in their area with Ibbi, Paiko, Malale, having 17.33% Yes respectively being the highest, while Zuguruma (14.67%) said Yes and 5.33% said No being the lowest.

Table 2. Awareness of Conservation Education in the study area

Communities	Yes	No	χ^2	df	P
Zuguruma	11 (14.67%)	4 (5.33%)	1.4888	4	*(P<0.05)
Ibbi	13(17.33%)	2(2.67%)			
Wawa	12(16%)	3(4%)			
Paiko	13(17.33%)	2(2.67%)			
Malale	13(17.33%)	2(2.67%)			
Total	62(82.66%)	13(17.34%)			

Source: Field Survey, 2022 ($\chi^2 = Chi Square; df = degrees of freedom; (N = 75)$)

Figure 1 shows the place where awareness of conservation education are acquired in the study area%, the fig shows that (60%) respondents acquire their conservation education from the school being the highest while (13.33%) get awareness of conservation education while at home.

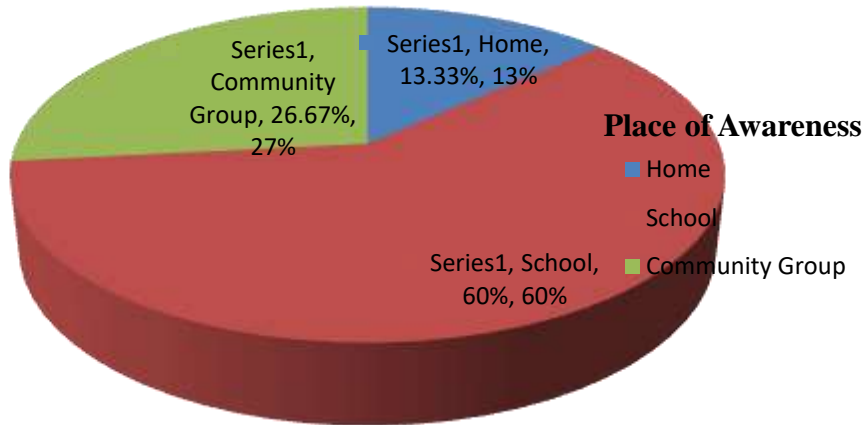


Figure 1. Place where Awareness of Conservation Education are acquired in the study area

Figure 2 shows the materials used and given during conservation education (%). The figure shows that 40% respondents admits that the materials given to them during the course of conservation education includes T. Shirts and books respectively while 20% respondents said they were given books.

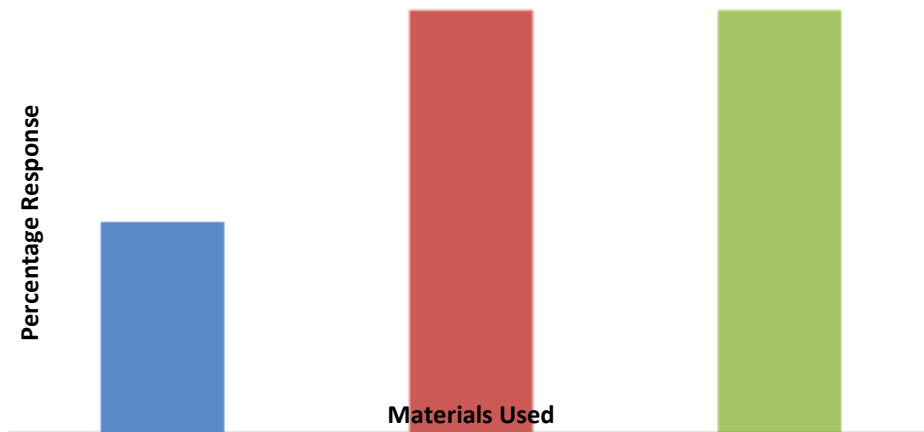


Figure 2. Materials used and given during conservation education (%)

Figure 3 shows the knowledge and attitude of communities towards wildlife conservation (%), the result shows that 49.33% respondents are highly interested in wildlife conservation. While 9.33% are not interested.

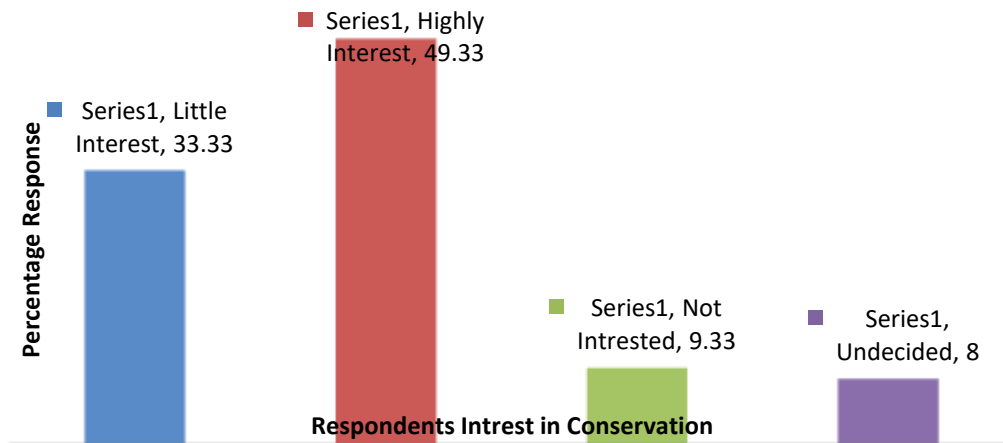


Figure 3 Knowledge and Attitude towards Wildlife Conservation (%)
 Source: Field Survey, 2022

Figure 4 shows the Effectiveness of hearing Conservation Education Effort%. The figure shows that the park authority and community respondents reported the effort of the park to be effective having 30% and 30.67% respectively being the highest. While park authority and the community respondents who said that conservation education is not effective is only 10% and 14.67% respectively being the lowest.

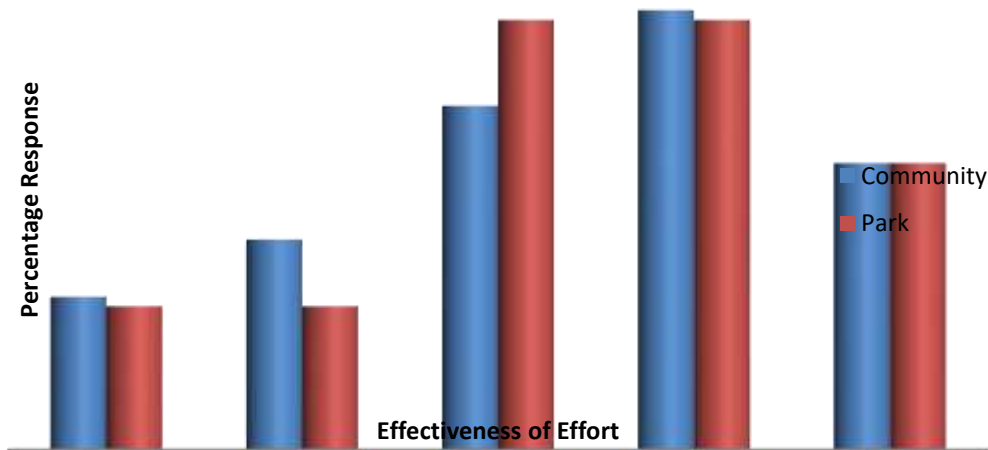


Figure 4. Effectiveness of hearing Conservation Education Effort

Table 3 show the Conservation Education Awareness Impact on the Communities. The table shows that Conservation Education Increase the peoples understanding of wildlife management with 98.66% across the community saying Yes and 98.66% respondents declaring interest in wildlife conservation. While 88% admits that conservation education of the park authority has help to increase the livelihood of most people in the communities.

Table 3. Conservation Education Awareness Impact on the Communities

Impacts	Overall Response	Across the Communities (df =4)	Reasons
Increase your understanding of wildlife	Yes (98.66%)	$\chi^2 = 4.054$ P= 0.39874	Conservation education increases our understanding of wildlife management and protection. It help us to know that deforestation kill our native trees and deprive us from the many benefit of those tree e.g. Shae butter tree.
Interest in wildlife conservation	Yes (98.66%)	$\chi^2 = 4.054$ P= 0.39874	Wildlife is of value, Wild life health of environment. Provide bush meat Generates income and employment to people Raises Local income through ecotourism enterprises.
Visitation of National parks	Yes (86.66%)	$\chi^2 = 1.1538$ P= 0.88564	Students and other group of people visit the park to view wildlife, and carry out research.
Community permission to hunt animals	No (88%)	$\chi^2 = 1.7677$ P= 0.77839	Through CE. Community is encouraged to consume less bush meat, hence Bush meat consumption is not common in the area.
Increase the livelihood enhancement of the communities.	Yes (88%)	$\chi^2 = 1.7677$ P= 0.77839	Alternative source of lively hood was thought and created for us, such as bee keeping, livestock rearing, tree planting as seen in Wawa, Zugruma etc

(χ^2 = Chi Square; df = degrees of freedom); (N = 75); N.S. (P>0.5) HO reject, it is therefore true that the proportion of impact is different for Yes and No across the communities

Table 4. Conservation Education Awareness Impact on Wildlife Protection in KLNPN%. The table shows that Conservation Education help promote livelihoods having (88%) positive response, it decreases environmental

impact, by reducing poaching (74.67), Reduce illegal bush burning (66.67), Reduce Deforestation (60%) and promote conservation of wildlife through visitation of National parks to view wildlife (74.67).

Table 4. Conservation Education Awareness Impact on Wildlife Protection in KLNP%

Impacts	Percentage Response		
	Yes	No	Undecided
Reduce Poaching	74.67	18.67	6.67
Reduce illegal bush burning	66.67	30.67	2.67
Reduce illegal fishing	60	24	16
Has increase	74.67	20	5.33
Visitation of National parks to view wildlife			
Reduce Deforestation	60	16	24
Others	58.67	10.67	30.67

Source: Field Survey, 2022

4. Discussion

Conservation education program carried out by KLNP at both schools and community area appear to be in good direction toward learning about the park and biodiversity. The finding in table 2, show the awareness of conservation education in the study area, the finding indicates that majority of the respondents across the communities are aware of conservation education in their area. The chi-square test showed that the proportion of awareness is significantly different $(P < 0.05)$ between those who are aware and those who are not.

Findings in figure 1 show the place where awareness of conservation education is acquired in the area. the finding indicates that majority of the respondents got informed in the school and at the community group gathering talk presentation, others were informed while at home either through house to house park visit, or from their school children or their family members working in the national park. Whichever way and were conservation message is passed. Steinmetz *et al.* (2006) stated that awareness is crucial to the effective implementation of conservation strategies, while a correctly designed conservation education would affect people's attitudes and behavior towards wildlife conservation and add to the protection of their environment (Sterling *et al.*, 2007).

Creating a strong sense of awareness of environmental issues was an element shared by all of the conservation education programs to varying degrees. Attention was drawn to the need to address problems in their own communities and understand the implications of these issues not only for their own lives but on a larger scale. Students through the conservation education message were well aware of the concerns related to health hazards of things like pollution and saw this as an important local issue in which they could become involved.

The materials used and given to the people during the course of conservation education includes flyers, T. Shirts and books (Figure 2). It is

therefore believed that strong environmental education programmes are essential for long-term conservation (NCF 2015), and the provision of environmental education-related newspapers and magazines is of paramount importance in schools (Akinuoye and Abd Rahim 2011). By doing so, information about project activities and regional issues is disseminated to a larger audience (Wals, 2014).

The findings on the conservation education awareness impact on the communities indicates that conservation education increases the peoples understanding of wildlife management and protection. It helps them to know that deforestation kill our native trees and deprive us from the many benefits of those tree e.g. Shea butter trees. Wildlife conservation increase the livelihood enhancement of the communities and also raises local income through ecotourism enterprises. This agrees with Rakotomamonjy *et al.*, (2015) report that conservation education may be beneficial for increasing sustainable and environmental behaviours, particularly in rural communities in the vicinity of protected areas.

Conservation education had a significant effect on the knowledge of wildlife conservation in the study area. Comparing the conservation education awareness impact on the communities indicates that impact was not significant at $(P > 0.5)$ while H_0 is rejected, and shows that the proportion of impact is significantly different for Yes and No across the communities.

Conservation education awareness has a positive and statistically significant impact $(\chi^2 = 4.054)$ on wildlife conservation. The program increases knowledge across the community, when combined with field trips and other learning tools, such as conservation films (Leeds *et al.*, 2017), it impacts on the members of the community visitation to National parks and it increases the livelihood enhancement of the communities. It helps to reduce poaching, illegal bush burning, reduce deforestation, and promote conservation of wildlife through visitation of National parks to view

wildlife. This agrees with Damerell *et al.*, (2013) assertion that there is some evidence to suggest that knowledge improves pro-environmental attitudes, which presumably precede pro-environmental behaviours, hence Norzaini *et al.*, (2009) asserted that an informed society or community will make wise decisions about protecting and preserving resources that define the very essence of their culture and society. This will lead to less conflict between the park protection methods and the community acceptance of development initiatives through conservation for instance in all the communities visited, reference was made by the community leader to the work which the park authority had undertaken in the communities grounds, given their old and young jobs in the park. Ornamental and fruit trees, shrubs and flowers were planted, plant nurseries were established, etc. In some schools, lands around the school were being cleared by club members to plant fruit trees and gardens. In several communities, through NGOs interventions, there were nurseries which provided tree seedlings and other plants to the community. Boreholes were provided as seen especially in Ibbi, Wawa and Zuguruma community. Sometimes quarterly magazine produced by the park authority covering all aspects of conservation work are sent to schools and individuals.

The park also regularly produces a variety of posters, pamphlets, calendars, and learning/teaching materials on environmental issues for visitors. Many of the materials, along with a wide variety of materials from other sources, were prominently displayed in the park information room, the first point of call for visitors and school children to have firsthand information about the park. Some posters and booklets have also been produced and are distributed during the Conservation education coordinators' visits to schools. Understanding of the implications of current forest-use practices, poaching un-authorize bush burning, illegal wildlife trade was clearly evident in the community. Creating awareness has helped to minimize these illegal activities.

5. Conclusion

This study has helped us to know that conservation education programs impacted positively on the growth and conservation of wildlife resources of the area. Conservation education knowledge gained has help in the protection and conservation of park resources. It has also helped in the livelihood enhancement of the communities through park authorities community interventions. Hence there is significant relationship between communities' level of knowledge and their impact on the protection and conservation of park resources.

6. Recommendations

The following recommendations are deduced from the study:

- To set up environmental conservation groups in villages for rural youth in close collaboration with field officers from the Wild Life Department stationed in these areas.
- The park and the community leaders should set up youth groups to also assist in organizing environmental programmes in the village schools in their areas. This would also increase the awareness of the importance of environmental education within the village community as a whole, leading to a better understanding of wildlife conservation.
- Additional research on outcomes associated with long-term conservation education programmes will be useful for continuing to identify best practices in wildlife conservation.

References

- Akinnuoye M.A and Abd Rahim M. N. (2011). Implementation of Environmental Education: A Case Study of Malaysian and Nigerian Secondary Schools. *International Conference on Biology, Environment and Chemistry IPCBEE Vol.1 IACSIT Press, Singapore*
- Brewer, C. (2002). Outreach and partnership programs for conservation education where endangered species conservation and research occur. *Conservation Biology* 16, 5–6.
- Carleton-Hug, A., and J. W. Hug. 2010. "Challenges and Opportunities for Evaluating EE. Programs." *Evaluation and Program Planning* 33 (2): 159–164.
- Collado, S., H. Staats, and J. A. Corraliza. 2013. "Experiencing Nature in Children's SummerCamps: Affective, Cognitive and Behavioural Consequences." *Journal of Environmental Psychology* 33: 37–44.
- Damerell, P., Howe, C. & Milner-Gulland, E.J. (2013) Child-orientated environmental education influences adult knowledge and household behaviour. *Environmental Research Letters*, 8. 015016
- Ezealor, A. U. (2002). Critical site for biodiversity conservation in Nigeria. NCF, Lagos.
- Kuhar, C.W., Bettinger, T.L., Lehnhardt, K., Tracy, O. & Cox, D. (2010) Evaluating for long-term impact of an environmental education program at the Kalinzu Forest

- Reserve, Uganda. *American Journal of Primatology*, 72. 407-413.
- Leeds, A., Lukas, K.E., Kendall, C.J., Slavin, M.A., Ross, E.A., Robbins, M.M. (2017) Evaluating the effect of a year-long film focused environmental education program on Ugandan student knowledge of and attitudes toward great apes. *American Journal of Primatology*, 79.622-673
- NCF - Nigerian Conservation Foundation- (2015) Environmental Education <http://www.ncfnigeria.org/programmes/environmental-education/>; Retrieved on 9/5/2015
- Norzaini, A., Sharina A. H., & Ibrahim K. (2009). Integrated Public Education for Heritage Conservation: A Case for Langkawi Global Geopark. In Ainsworth G & Garnett Stephen, S. (Editors) (2009). RIMBA: Sustainable Forest Livelihoods in Malaysia and Australia. LESTARI, UKM: *Bangi*. 151-157. ISBN: 978-967-5227-30-1
- Rakotomamonjy, S.N., Jones, J.P.G., Razafimanahaka, J.H., Ramamonjisoa, B. & Williams, S.J. (2015). The effects of environmental education on children's and parents' knowledge and attitudes towards lemurs in rural Madagascar. *Animal Conservation*, 18. 157- 166.
- Skibins, J. C., R. B. Powell, and M. J. Stern. 2012. "Exploring Empirical Support for Interpretations' Best Practices." *Journal of Interpretation Research* 17 (1): 25–44.
- Steinmetz, R., Chutipong, W., and Seuaturien, N. (2006). Collaborating to conserve large mammals in Southeast Asia. *Conservation Biology*, 20, 1391–1401.
- Sterling, E. J., J. Lee, and T. Wood. 2007. "Conservation Education in Zoos: An Emphasis on Behavioral Change." In *Zoos in the 21st Century*, edited by A. Zimmerman, M. Hatchwell, L. Dickie, and C. West, 37–50. Cambridge, UK: Cambridge University Press
- Wals, A. E. (2014). Convergence between Science and Environmental Education. *Science*. 344 (6184), pp. 583-4. 11.10.14. Available at:
<<http://www.sciencemag.org/content/344/6184/583.full.pdf>> Retrieved 5/8/2015