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Role of Environmental Education on Human-Wildlife Conflict in Kainji Lake National Park, Nigeria

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ABSTRACT: The research work assessed the role of environmental education on Human-Wildlife conflict in Kainji Lake National Park, Nigeria. Simple random techniques was used to administer questionnaire to the Park staff while purposive sampling technique was used to select the support zone communities and simple random sampling techniques was use to administer questionnaire to the household. The sample size was put at 120 respondents, of which eighty one (81) questionnaire were retrieved. The finding shows that majority of the respondents (76 individuals) has experience human-wildlife conflict before while 5 individuals has no experience with human-wildlife conflicts before. The various preventive method used by the respondents to prevent human-wildlife conflicts indicated that Watch guarding recorded the highest (27.2%), followed by Scare crow with 23.5% while fire and smoke is the least with 8.6%. Majority (66.7%) of the respondents are aware of environmental education while 33.3% are not aware. Role of environmental education in managing human-wildlife conflicts are supporting the communities to recover and rebuild themselves after Wildlife conflicts recorded the highest with 32.1% while maintain community trust is the least with 6.2%. The study concludes that majority of the respondents are aware of environmental education and they indicated that environmental education are moderately effective.

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Human-wildlife conflict (HWC) is fast becoming a critical threat to the survival of many wildlife species (Mardaraj and Sethy, 2015). According to the World Conservation Union (World Park Congress 2003), it occurs when wildlife's requirements overlap with those of human populations, creating costs to residents and wild animals. Driving forces such as human population growth, species habitat loss, urbanization, degradation and fragmentation have led to increased instances of human-wildlife conflict. Most instances that are referred to as human-wildlife conflict are based on a human perception that wildlife is threatening something they care about, whether that be property, health and safety or food sources (Conover, 2002). However, solutions to wildlife damage problems differ from methods to resolve the human-human conflicts that arise from trying to decide on appropriate wildlife management efforts. Environmental Education (EE) is a form of conflict management which can be defined as eliminating conflict by creating a resolution and reducing the negative impact of conflict using management techniques (Redpath *et al*., 2013). Creating educational tools is about creating a dialogue, as conflict management is about bringing parties or stakeholders face to face to discuss reasonable solutions. A well-informed public may be the most important way to preserve native species and decrease instances of human-wildlife conflict (McKinney, 2002). Alternative solutions should be explored through technical, *educational,* and legislative means. Creating educational tools is about creating a dialogue,

as conflict management is about bringing parties or stakeholders face to face to discuss reasonable solutions. A well-informed public may be the most important way to preserve native species and decrease instances of human-wildlife conflict (McKinney, 2002). Individuals that live in urban environments often do have an appreciation for urban species, such as birds(McKinney, 2002). However, potential opportunities for conservation and peaceful coexistence are often hindered by a lack of ecological knowledge. For example, a study of high school students in Texas showed that 60% of the students misidentified an opossum as a rodent and only 2% knew of potential effects that humans have on raccoons. Education is a conflict mitigation approach that aims to modify human behaviour by reducing risk factors. This can be accomplished by increasing ecological knowledge surrounding conflict-causing or "nuisance" species and the most effective ways to reduce conflict (Dickman, 2010b). Using education and awareness, the goal is to reduce the prevalence of human-wildlife conflicts in urban areas and foster more positive relationships between people and the wild species we share our spaces with. Improving wildlife literacy can help to lessen hostility and reduce antagonism towards certain species, while liberating individuals to know how to appropriately respond when encountering wildlife (Dickman, 2010a). This enables people to better protect themselves, their pets and wildlife species. Many people have irrational fears of relatively harmless species, which often stems from a lack of understanding and fosters a poor relationship dynamic. Further, it can foster adjustments to common behaviours such as allowing domestic cats to roam free which has grave impacts on wildlife that many are unaware of (McKinney, 2002). Human-Wildlife conflict is a growing problem in the support zone communities of most National Park and can have significant impacts on both human and wildlife populations. Despite the application of different management practices, both locally and globally, the problem still exists. This calls for techniques and innovative approaches that could make a meaningful contribution to resolving such a long-term problem. The aim of this study therefore, was to establish the role that environmental education could play in addressing human-wildlife conflict in Kainji Lake National Park, Nigeria.

MATERIAL AND METHODS

Study Area: Kainji Lake National Park was established in 1979 by the amalgamation of two formal game reserves Borgu and Zugurma under decree 46 of 29th July 1997, thereby making Kainji Lake National Park the premier National Park in Nigeria (Ayeni, 2007). Kainji Lake National Park is located in the North central part of the country between latitude $9^{0}45'^{N}$ and $10^{0}23'^{N}$ and longitude $3^{0}40'^{E}$ and $5^{0}47'^{E}$. It is made up of two sectors (Borgu and Zugurma) situated in Borgu and Kaima/Baruten Local Government Areas of Niger and Kwara State respectively. It covers a total land area of 5,340.825q (Ayeni, 2007).

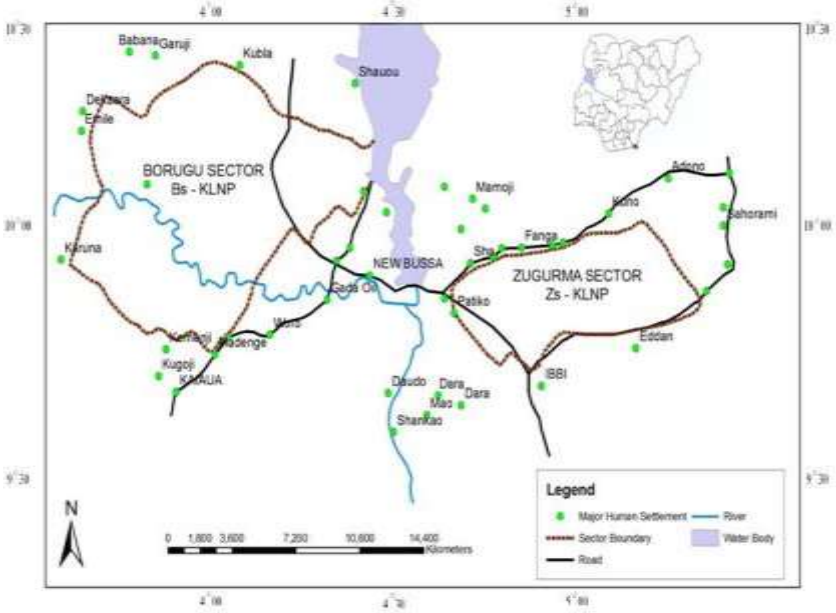

Fig1: Map of the Study Area Source: Ayeni, 2007

Study Population: The target populations are the staff of Kainji Lake National Park and residents of selected support zone communities of Kainji Lake National Park. Four (4) support zone communities were selected (Gada-oli, Wawwa, Felegi and Ibbi).

Methods of Data Collection: Primary and secondary data was used for this study. Primary data was collected with the aid of questionnaire and interview with the village head of the selected support zone communities while the secondary data on the other hand comprises the use of related documents of the Park, especially those related to the various methods of environmental education.

Sampling Techniques and Sample Size: Simple random techniques was used to administer questionnaire to the Park staff while purposive sampling technique was used to select the support zone communities and simple random sampling techniques was use to administer questionnaire to the household. The sample size was put at 120 respondents, of which eighty one (81) questionnaires were retrieved.

Data Analysis: Data obtained was analysed using descriptive statistics where results was expressed in table, bar and chart. The analysis was performed using Microsoft excel.

RESULTS AND DISCUSSION

Table 1 shows the demographic characteristics of the respondents, it was observed that 93.8% of the respondents were male while 6.2% were female. Age group 31-40 years recorded the highest with 39.5% while age group 51 years and above is the least with 7.4%. The table further revealed that 64.2% of the respondents are Muslim while 35.8% are Christian. Also majority of the respondents are married with 65.4% while 34.6% are unmarried. It was also shown that majority (38.3%) of the respondents had primary education while tertiary education is the least with 11.1%. The size of household revealed that 50.6% had a household size of 1-5 while 11 and above is the least with 3.7%. Majority of the respondents (53.1%) had stay in the study area between 6-10 years while 11 years and above is the least with 20.9%. Fig 1 showed the experience of Human-Wildlife conflicts in which 76 respondents has experience human-wildlife conflict before while 5 respondents has no experience with human-wildlife conflicts before. The species of animal that mostly caused Human-Wildlife conflicts are revealed in table 2, eight (8) animals were recorded. The various preventive method use by the respondents to prevent human-wildlife conflicts is revealed in Table 3, Watch guarding recorded the highest (27.2%), followed by Scare crow with 23.5% while fire and smoke is the least with 8.6%. Fig 2 indicated that majority (66.7%) of the respondents are aware of environmental education while 33.3% are not aware. Role of environmental education in managing human-wildlife conflicts are revealed in table 4, in which supporting the communities to recover and rebuild themselves after Wildlife conflicts recorded the highest with 32.1% while maintain community trust is the least with 6.2%. The effectiveness of the environmental education are indicated in fig 3, in which 65.4% of the respondents indicated that environmental education are moderately effective, followed by not effective with 20.0% while 2.5% indicated highly effective.

Table 1: Demographic Characteristic Of The Respondents

Demographic	Variables	Frequency	Percentage (%)
Gender	Male	76	93.8
	Female	5	6.2
Age Group	21-30 years	16	19.8
	31-40 years	32	39.5
	41-50 years	27	33.3
	51 years and above	6	7.4
Religion	Muslim	52	64.2
	Christianity	29	35.8
Marital	Married	53	65.4
Status	Unmarried	28	34.6
Level Of	No formal education	19	23.6
Education	Primary education	31	38.3
	Secondary education	22	27.2
	Tertiary education	9	11.1
Size of	1-5	41	50.6
Household	6-10	37	45.7
	11 and above	3	3.7
Length of	1-5	21	25.9
Residency	6-10	43	53.1
(Years)	11 and above	17	20.9
	Total	81	100.0

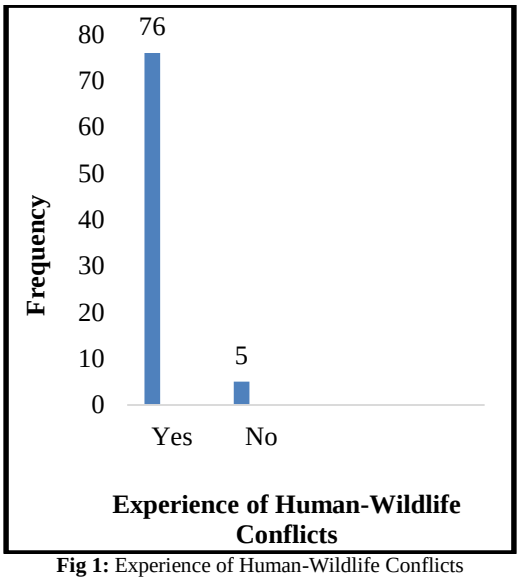

Fig 1: Experience of Human-Wildlife Conflicts

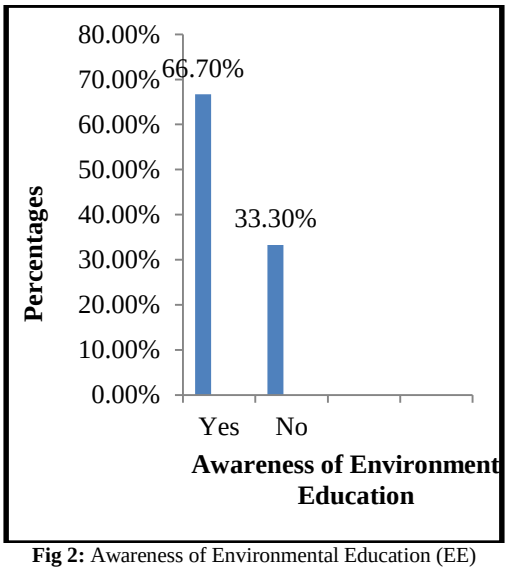

Fig 2: Awareness of Environmental Education (EE)

Table 2: Species of Animal that Mostly Causes Human-Wildlife Conflicts

S/N	Species	Scientific Name
1	Patas Monkey	*Erythrocebus patas*
2	Warthog	*Phacochocerus africanus*
3	Grasscutter	*Thryonomys swinderianus*
4	Francolin	*Francolinus bicalcaratus*
5	Stone partridge	*Ptilopachus petrosus*
6	Duiker	*Sylvicapra grimmia*
7	Hippopotamus	*Hippopotamus amphibius*
8	Baboon	*Papio Anubis*

Table 3: Preventive Measures Taken Against Human-Wildlife Conflicts

Prevention	Respondents	Percentage (%)
Watch Guarding	22	27.2
Trapping	11	13.6
Fire and Smoke	7	8.6
Scare Crow	19	23.5
Thorn Fencing	9	11.1
Hunting	13	16.0
Total	81	100.00

Where people and wildlife live in close proximity, wildlife can negatively affect human livelihoods (Ogada*et al*. 2003). These impacts, in turn, often encourage people to kill wildlife, degrade wildlife habitat, or not comply with regulations designed to protect wildlife. Such activities contribute to declines of many wildlife populations. Many communities in wildlife areas do not receive benefits and yet they bear the costs of living with wildlife (Kanga *et al*., 2011a). Rapid decline of wildlife has been noted in areas where benefits are not accrued to the local community (Naughton-Treves, 1998). This is because the community tries to engage in other land-use practices that are not only detrimental to wildlife population, but also result in increased conflicts (Wolman and Fournier, 2007).

Table 4: Role of Environmental Education in Managing Human-Wildlife Conflicts

Roles	Respondents	Percentage (%)
Provision of accurate and timely information to the community on how to curtail wildlife conflict	21	25.9
Identify and address myths and misconceptions about wildlife animals	18	22.2
Maintain community trust	5	6.2
Reassure the community	11	13.6
Support the communities to recover and rebuild themselves after Wildlife conflicts	26	32.1
Total	81	100.00

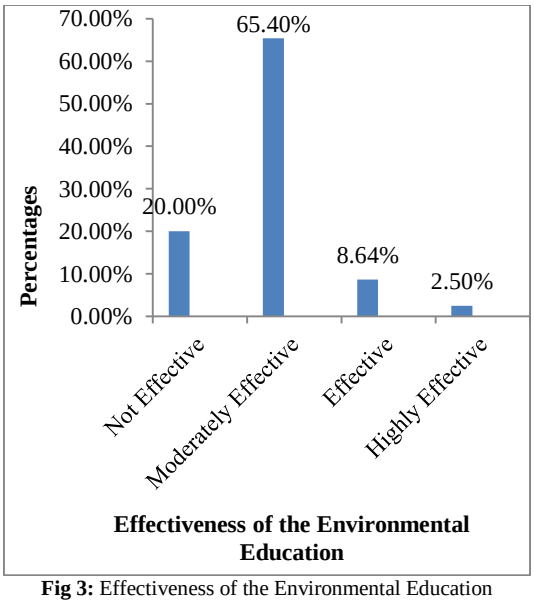

Fig 3: Effectiveness of the Environmental Education

This study revealed that human-wildlife conflicts are experience in the study area as a result of crop raiding by wildlife on the farms of the respondents. This kind

of conflicts has been previously reported by various authors, which they states that the pattern of human-wildlife conflict was related to agriculture (crop damage and over grassing of grassland) and is similar to that reported by Mkanda and Kumchedwa (1997) and Kanga *et al*. (2011a). Wildlife animal crop raids are unpredictable and can cause more damage per raid (Post, 2000). Crop damage by wildlife animal was by feeding, by trampling and destroying certain areas of the field (Post, 2000; Kanga *et al*., 2011c). The respondents have engage into various means to prevent there self and their crops from the invasion of wildlife animal, the methods involves using of smoke and fire, hunting, trapping, and fencing. Putting fences at the edge of the land and at run way of the wildlife or entering sides of the land used to synchronize the animals from crop. Digging deep and narrow towards the bottom furrow at entering sides of the land and covered it with grasses used as a trap. The animal will not be able to move forward or backwards and cannot come out once enter into the rut (Eltringham, 1999). This technique is used as a trap to kill the hippopotamus. Similarly, farmers live in and around Lake Victoria used fencing materials like cedar poles and barbed wire and digging of trenches to minimize crop damage by Warthog (Post, 2000). The study revealed that 66.7% of the respondents have idea on the role of environmental education. This could havebeen due to the fact that the majority of the respondents have some level of formal education. The information on understanding EE was critical in assessing how much stillneeded to be done in terms of filling in gaps related to conceptions of environmental education. Environmental education helps individuals to comprehend the capacity, capability as well asthe constraints of the environment with respect to the broad global environment, this enablesthem to make collective or individual decisions that are economically as well as ecologicallysound (UNESCO-UNEP, 2017). Previous research has demonstrated that the moreknowledgeable people are about human-animal conflict in their area, the more tolerant theytend to be of their presence (Ericsson and Heberlein 2003). Knowledgeable people are alsomore likely to behave in a way that lessens the chance of conflict arising in the first place (Conover 2002). However, this is not a clear-cut relationship: studies in the US have shownthat knowledge is often only weakly correlated with values and attitudes towards wildlife,with correlation coefficients of 0.30 or less (Tarrant *et al.* 1997). Despite this, misinformationand a lack of knowledge about carnivores has been linked to higher human-wolf conflicts insouthern Europe (Meriggi and Lovari 1996) and more intense jaguar-human conflicts inBrazil (Conforti and de Azevedo 2003). Environmental Education and training activities atdifferent levels, for instance in schools or in adult education arenas such as farmer fieldschools, would have the objective of disseminating innovative techniques, building localcapacity in conflict resolution and increasing public understanding of Human-Wildlife conflict.

Conclusion: The Kainji Lake National Park has a lot of wildlife species and this includes species that causes damage to people's farm and livestock which results to human-wildlife conflicts. Majority of the respondents are aware of environmental education and they indicated that environmental education are moderately effective in the study area. The study therefore recommends that victims of wildlife attacks in the surrounding communities should be compensated and the National Park Management should try to create alternative means of livelihood for farmers.

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