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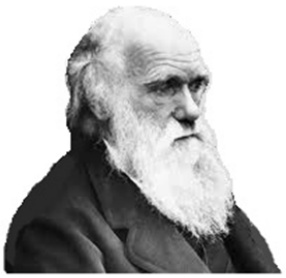

World News of Natural Sciences

An International Scientific Journal

WNOFNS 18(2) (2018) 223-231 EISSN 2543-5426

Primates Associated with Crop Raiding Around Borgu Sector of Kainji Lake National Park, Nigeria

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ABSTRACT

Crop raiding activities of primates around Kainji Lake National Park (Borgu Sector), Nigeria was investigated with the use of questionnaires, complemented with field survey focus group discussions and in-depth interviews. One hundred (100) questionnaires were administered to representatives of households in four selected support zone villages. Group discussions were then conducted in the villages. Data collected were analyzed using descriptive statistics in the form of percentages, frequencies and charts. We found that crop raiding and animal depredation were sources of conflict in Kainji Lake National Park (Borgu Sector). The primates raiding farmlands identified by the farmers were Olive Baboon (*Papio anubis*), Patas monkey (*Erthrocebus patas*), green monkey (*Chlorocebus aethiops*) and other primates that could not be identified by the farmers. The largest percentage of raiding (40%) was perpetrated by *Papio anubis*, followed by Patas monkey (35%) and the least by Green Monkey (2%). The result showed that maize was the most commonly ranked crop of seasonal harvest that was lost. Moreover, an estimated 3-5 50 kg bags of seed were being destroyed in the planting season. The most effective strategy the local communities used in preventing crop damage was watch guarding (70%). Other methods were fencing (60%), hunting (45%), scare crow (36%) and toxic chemical (5%). The mitigation measure advocated by nearly all respondents (57%) was the killing of destructive wildlife species, irrespective of conservation significance. Measures must put in place to educate these communities about wildlife conservation and to prevent wanton killing. The communities should also be compensated for their loss, as this will lead to positive attitudes to wildlife conservation.

***Keyword*:** Primates, Raiding, Borgu sector, Community and Kainji Lake National Park, *Papio anubis*, *Erthrocebus patas*, *Chlorocebus aethiops*

(Received 23 April 2018; Accepted 07 May 2018; Date of Publication 08 May 2018)

1. INTRODUCTION

In wildlife conservation, conflicts are those negative experience that human receive from wildlife, Human-wildlife conflict are escalating and have become a significant issue in conservation and land management of a protected area (Hudson and Cattadore, 2006). Understanding and addressing conflict between humans and wildlife due to crop-raiding is a crucial conservation issue (Graham and Ochieng, 2008).Around Kainji Lake National Park (KLNP), land hunger due to increase in human desires for space to meet their livelihood needs is of great concern (Ogunjobi and Adeola, 2016).

Inadequacy of any reliable information on the extends, frequency of occurrence, causes dynamics and nature of human-wildlife conflicts. Wildlife conservation is not only of key importance in ensuring sustainability of earth resources and the integrity of the environment but also of immeasurable benefits to human existence. Yet it's now being threatened by conflicts which often arise as a result of overlapping human wildlife interest. Human-wildlife conflicts are more intensive in developing countries where livestock holding and agriculture are important parts of rural people livelihoods and income (Boer and Baquete, 1995). In these area, competition between local communities and wild animals for the use of natural resources in particularly intense and direct. As a result resident human population or wildlife is vulnerable (Messmer, 2000).

According to Andrade and Rhodes (2012) restricting local access to natural resources, which can play a crucial role in their livelihoods, health and culture might favour biodiversity conservation in the short term. In Nigeria, many rural people living close to a protected areas depends directly on natural resources for their livelihoods and food security, while this wildlife causes losses as well as pose threat to man and his livestock.

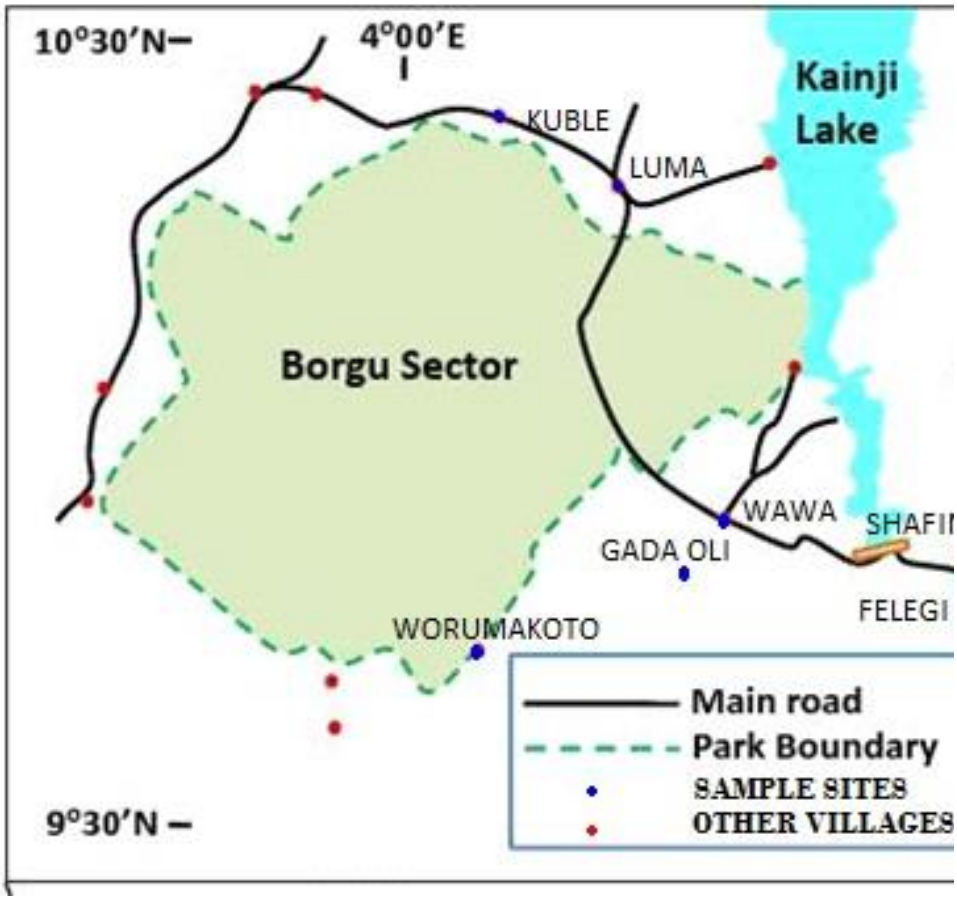
In western Uganda for example, crop raiding has been identified as a key form of human-wildlife conflict and the most important perceived disadvantages of farming close to protected areas (Archabald and Naughton-Treves, 2001). Crops near forest are sources of food for wildlife and damages through raiding by wild animals can cause reduced farmers livelihood (Strum, 2010). However, the orders of wild animals most often cited are primates and rodents (Newmark *et al.*, 1994; Kaswamila, 2007).

This therefore leads to non cooperation of the rural people and consequently constant disagreement between the people and the protected area authority. People lose their crops, livestock, property and sometimes their lives. Communities have been expelled from national parks or denied the use of resources within the parks in line with the principle of conservation of resources in National Parks reserve (King Mahendra Trust for Nature Conservation (KMTNC), 2005).

Oseomeobo (1992) reported that the right of the surrounding communities to exploitation of flora and fauna resources in game reserves and national parks were extinguished following their establishment, hence the conflicts which reflect the people's sharp reaction against the discriminating government policies on their own land. Although the ultimate aim of community conservation is to conserve natural resources and biodiversity, the intermediate outcome is to change human behavior and attitudes about conservation. Understanding and addressing possible conflict that can arise due to crop raiding is a crucial conservation issue. This study evaluated the common primates engaged in crop raiding around KLNP, Nigeria.

2. METHODOLOGY

2. 1. Study Area



Map 1. Map of the Study area

Kainji Lake National Park is located in The North West central part of the country between latitude 9°45'N and 10°23'N and longitude 3°40'E and 5°47'E. It is made up of two sectors Borgu and Zugurma. Borgu sector is situated in Borgu and Kaima/Baruten Local Government Area of Niger and Kwara state respectively while Zugurma sector is situated in Mashegu Local Government of Niger state. It covers a total land area of 5,340.82 Sq/M. The major features of the climate of the park is that it is divided into wet and dry seasons and the variability is from year to year. The wet season extends from May to November while the dry season extends from December to April. The mean annual rainfall of the sector varies from 1,100 mm in the trends surface analyses of the mean annual rainfall in the sector by Milligan 1979, indicated a decrease in rain from the south to the north, an increase rainfall towards the west and east, and generally low condition in the central and northern region, which stretches from the north through the central regions, to the south. Temperature of the park shows a distinct pattern of temperature. It is high in the dry season just before the rain and lower during the wet season, it picks up again towards the end of the wet season and later drops to

the lowest value in December and January during the harmattan. The highest temperature are recorded between April and May and between July and August (Kiss, 1990), there is also a marked variation between the Maritan temperature during the dry light hours, with morning temperature greater than afternoon temperature. Absolute temperature may be more extreme than average values as during the harmattan, temperature may be more extreme than average values as during the harmattan, temperature as low as 10 °C may occur in the Oli valley, while diurnal temperature during this period may exceed 30 °C (Allendorf, 2006).

The relative humidity appears to increase gradually from value at the beginning of the day season to a peak during the wet season and in general the relative humidity follows an opposite pattern to that of the temperature. Wind is both the incidence and duration of the wet season, and considering the year as a whole, the northern winds predominates over southern winds in the sector of the park. There is also a distinct season trend, with the dry dusty, Northern winds prevailing during the beginning of the dry season that is November to February while the moist southern winds prevail throughout the wet season.

3. METHODS OF DATA COLLECTION

Data was collected by rapid village and field assessment. Rapid assessment method was carried out using focus groups, structured questionnaires and in-depth interview. Data was collected in four support zone of Borgu Sector of Kainji Lake National Park. These communities were Kuble, Lumma, Kemeji and Wurumakoto. A set of structured questionnaire were administered to household representatives in the four villages.

The questionnaires were randomly administered to twenty five respondents representing the four settlements. Household representative include both males and females of various age group. Also in-depth interview, were conducted, with the assistance of the interpreters from each villages that have land for a minimum of twenty years and have been conversant with events happening in the villages. focus group discussion were also used to gather information on how local communities perceived wildlife, especially the primate group, respondent, level of wildlife tolerance. Benefits derived from the park and suggestions on how to check further conflict. The group discussion was conducted with the aid of translators, the traditional chief were also interviewed. Data collected were analyzed using descriptive statistics inform of percentages, frequencies, tables and charts.

4. RESULTS

Table 1 shows the different types of primate that usually raid the farm of the communities. It was reveal that Olive baboon (*Papio anubis*) recorded the highest with 40% followed by Patas monkey (*Erthrocebus patas*) with 35% while least is Green monkey (*Chlorocebus aethiops*) with 2%. Various types of crops grown by the community is depicts in Table 2, it was reveal that Maize recorded the highest with 25%, followed by Guinea corn with 22% while the least is Cassava with 3%. Figure 1 revealed that most respondents 60% complained that the destruction caused in their farm by primates were in the order of 4-5 bags of 50 kg size of crops per season. Other respondents reported 3-4 bags 20% and 6-8 bags 12%. Table 3 shows the crops that is mostly destroyed by primates in the study area, Maize

recorded the highest with 70%, follow by Cassava with 10% while the least is Beans and Rice that recorded 6% respectively. Figure 2 reveals the various methods of controlling crop damage by the farmers, All the respondents used watch guarding (35%) as means of safe guarding their farms, some fencing (20%), hunting (15%), trapping (14%), scare crow (10%) and toxic chemical (6%). Figure 3 shows that some of the respondent wanted the pest (animals) to be killed (15%) while majority advocated compensation from relevant government and non government agencies (55%), employment of youth as a guard (25%) and translocation of the people (5%) was the least.

Table 1. Primate that visited farm of respondents

Species of animals	No of respondents	Percentages
Olive baboon (*Papio anubis*)	40	40
Patas monkey (*Erthrocebus patas*)	35	35
Green monkey (*Chlorocebus aethiops*)	2	2
Others	23	23

Table 2. Types of crops grown by household in the study area

Crops	No of respondents	Percentage (%)
Guinea corn (*Sorghum bicolor*)	22	22
Maize (*Zee mays*)	25	25
Rice (*Oryza sativa*)	18	18
Cassava (*Manihot* spp)	3	3
Groundnut (*Arachis hypogea*)	17	17
Beans (*Phaseolus coccineus*)	15	15

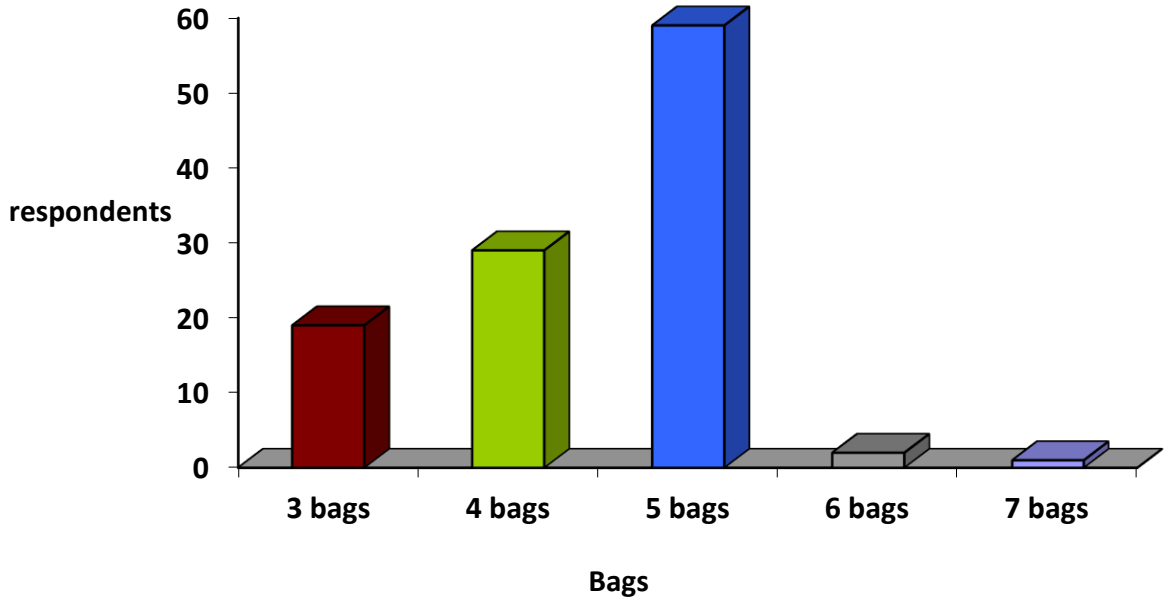


Figure 1. Assessment of Damages Caused By Primates in The Study Area

Figure 2. Method of controlling crop damages by the farmers

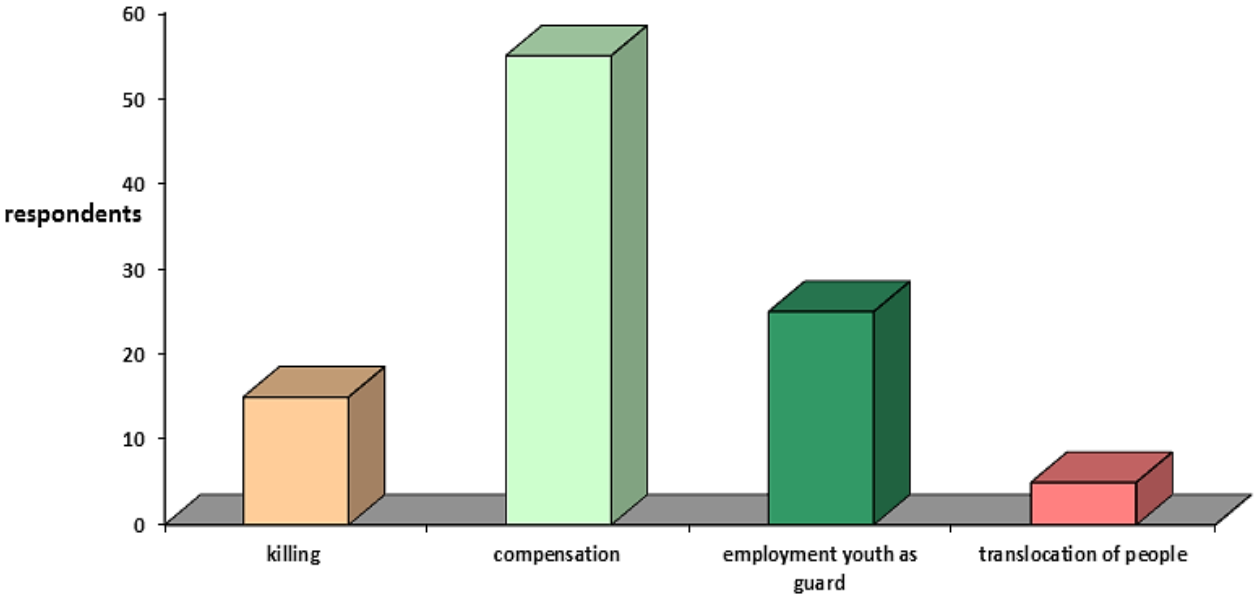


Figure 3. Mitigation measure suggested by respondents on how to prevent damages

Table 3. Ranking of crops in order of destruction by primates

Crop	Frequency	Percentage	Rank
Maize	70	70	1
Cassava	10	10	2
Beans	6	6	3
Groundnut	8	8	4
Rice	9	6	5

5. DISCUSSION

The interviews farmers in the communities testifies that primates always raid their farms land, these primates includes Olive baboon (*Papio anubis*), Patas monkey (*Erthrocebus patas*), Green monkeys (*Chlorocebus aethiops*) and others kind of monkeys that cannot be identify by the farmers. Olive babbon (*Papio anubis)* alone accounted for about 40% of the total percentage of the raids while Patas monkey and Green monkey raids were 35% and 2% respectively but others monkey also recorded 23% of the total raid (Table1). Naughton-Treves (1997) explained that large mammals will often forage on agricultural land, and human-animal conflict will be a common problem in many places where farmland borders protected

areas. Baboons and rodents living near agricultural land were reported to often raid farms (Cuong *et al*., 2002; Kaswamila, 2007). Our finding agreed with Govan (2010) and Ogunjobi and Adeola (2016) report where it was stated that baboons are common near cultivated land. Primates visit farm lands around the park, which caused damages to crop during their visit. Six crops has been identified as the major crops cultivated by the farmers in the study area. Maize is a major crop cultivated by all the farmers in the study areas, (25%) of the people are engage in maize production and it is the major crops that is been pest upon by primates (70%), it needs serious attention to safe the entire populate from hardship as respondent economics are negatively affected, others crops cultivated are Guinea corn (22%), Rice (18%), Groundnut (17%), Beans (15%) and Cassava (3%). This finding is in line with Ogunjobi and Adeola (2016). Different methods have been employed by the farmers to save their crops from crop raiding, Majority of the farmers engage in watch guarding (35%) in other to prevent this primates from raiding crops while others resort to hunting, traps, Scare crow, toxic chemical and fencing (15%, 14%, 10%, 6% and 10% respectively) but watch guarding is the most effective because primates can jump over the fences to raid crops. If the farm is not seriously guarded the farmers could lose everything to primates. The respondents perceived that the management of the park should compensate them (55%) to meet with what they have loss due to crop raiding by primates while some of the option for employment (25%) so that they can leave the farm land and create room for the expansion of the park.

6. CONCLUSION

From this study, it can be conclude that crop raiding by primates is experienced around Kainji Lake National Park (Borgu sector). Six different crops was identify as the most cultivated crops and they were all raid upon by primates. Out of the six cultivated crops raided, Maize (*Zea mays)* is found to be predominantly affected. Olive baboon (*Papio anubis)* was reported to be responsible for the majority of the single raids. The farmers have engaged in different methods in controlling crops raiding by primates which includes Watch guarding, fencing, hunting, scare crow, traps and using of toxic chemical. The planting pattern of the farmers needs to be adjusted to reduce the menace of crop damage by the primates. In order to incorporate sustainable livelihood of the farmers and encourage farmers' tolerance to primates, research on how to develop realistic measures to reduce raiding activities of these wild vertebrates and support the livelihoods of the farmers around the park is inevitable.

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