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## ASSESSMENT OF CROP RAIDING ACTIVITIES OF WILD ANIMAL SPECIES IN KAINJI LAKE NATIONAL PARK, NIGERIA

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### ABSTRACT

*The study focused on the assessment of crop raiding activities in some communities around Zugurma sector of Kainji Lake National Park, Nigeria. The study identify the species of wild animals that raid farms, farm produce that were affected in the area, seasons such activities occurred and level of destruction to farm products in the study area. Two hundred questionnaires were administered purposely to some farmers in the support zones communities with close proximity with to park boundaries and only one hundred and seventy four questionnaires were retrieved. The communities sampled were Felegi, Shafinni, Babugi, Fanga, and Ibbi. Direct observation and personal interview using an interpreter was employed to source for information. Data collected were analyzed using descriptive statistics. The findings from this study revealed that Primates (*Erythrocebus patas* and *Chlorocebus aethiops tantalus*) had the highest percentage of raid in farm with (44.7%) while Ground Squirrel (*Xerus erythropus*), Western Hartebeest (*Alcelaphus buselaphus*), Grimm's Duiker (*Sylvicapra grimmia*) and Bushbuck (*Tragelaphus scriptus*) were the least raiders with (3.3%) respectively. This study also revealed that maize (*zea mays*) is the mostly raided crop with (19.1%) while cassava (*Manihot esculentus*) was the least with (2.5%). It was observed that crop raiding activities occur all year round with (43.7%) while less activity occur during the dry season with (27.6%) due to the fact that most crops had been harvested. The level of destruction caused by wild animals is very high with (94.3%) respondents attesting to this fact. The study shows that raiding activities affect farmlands that are very close to park boundaries more therefore, it is advisable for farmers to site their farmland far from park boundaries or cultivate crops that may not be destroyed by wild animals when they farm close to park boundaries.*

**Keywords:** Assessment, Crop Raiding, Primates, Protected Areas, Respondents.

### INTRODUCTION

Human-wildlife conflicts arise from direct and indirect negative interactions, leading to economic losses to Agriculture through destruction of crops, human fatalities and injuries, depredation of livestock and retaliatory killing of wildlife (Chardonnet *et al.*, 2010). Crop raiding around Protected Areas is one of the major challenges facing conservation efforts. The impact of crop raiding on attitudes of local communities towards Protected Areas can undermine efforts to gain their support for conservation, even when the programs provide substantial economic benefits. Until

recently, there has been little attention given to vertebrate species that damage crops, particularly crops of small-scale farmers in tropical and sub-tropical regions. Yet, there is good evidence that crop raiding is not a new phenomenon. Perhaps not surprisingly, certain species of primates are very successful crop raiders, (Hill *et al.*, 2002). There is a high degree of dependence on Agriculture for subsistence within communities in Africa. For approximately up to 80% of people, Agriculture is the sole source of livelihood (Hill *et al.*, 2002). One of the main challenges facing wildlife conservation in the twenty-first century is the increasing

interaction between people and wildlife and the resulting conflicts that emerge. This is as a result of increasing demand for land and the declining productivity of the already cultivated land, human communities are looking for virgin lands especially forests, which they believe to be more fertile than their own land, for increasing Agricultural productivity (Sillero and Switzer, 2001). The conflict is set to increase as Africa's human population keeps growing at a high rate and encroachment of Agriculture into land containing wildlife habitats continues (Hill, 2000). In their quest to protect their crops against wildlife raiding, farmers utilize strategies that are often cruel and ineffective. People lay traps e.g. snares, metal traps, poisoning the animals with pesticides like Furadan, hunting them with dogs and killing them and worst of it all, cutting down trees (Hill, 1997). Where humans and wildlife interface, conflicts of three types are common: livestock depredation, prey depletion from over hunting and direct human-caused mortality of wildlife (Frank, *et al.*, 2005; Miquelle, *et al.*, 2005; Rabinowitz, 2005; Treves and Karanth, 2003). In Borgu sector of Kainji Lake National Park frequently loss of food crops as a result wild animals raiding activities had been reported by (Adeola, *et al.*, 2017). The study identified species of wild animals that raids farm, crops that were affected, season where activities occurs mostly, level of economic damages caused by this activities and possible way out of menace.

## MATERIALS AND METHODS

### Study Area

The study area was Kainji lake national park, one of the seven (7) national parks in Nigeria. It extends 80

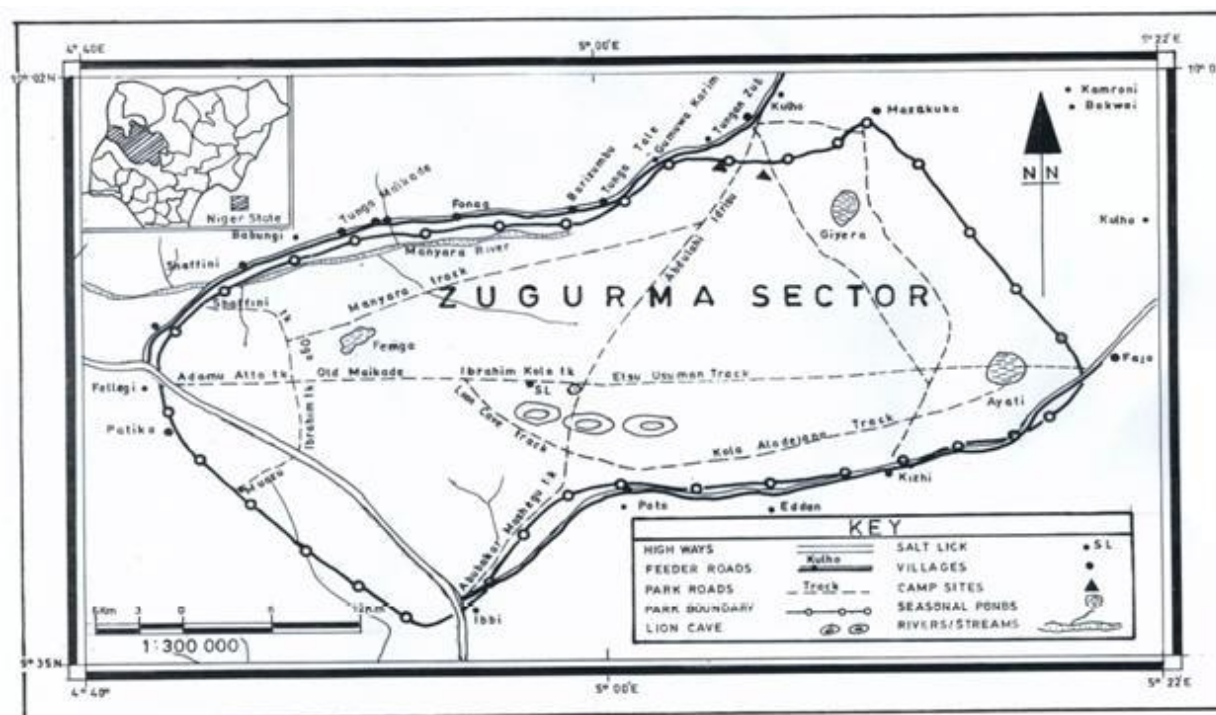
km in an East-West direction and about 60 km North-South. This park has two distinct sectors known as Borgu and Zugurma sectors. It lies between  $9^{\circ} 4^{\prime}$  to  $10^{\circ} 30^{\prime}$  N and  $3^{\circ} 30^{\prime}$  to  $5^{\circ} 50^{\prime}$  E, covering a total area of 5,340.82km (Ayeni, 2007). The study was conducted in Zugurma sector of the Park. The sectors cover an area of 1,370.80 km<sup>2</sup>. It was located in Mashegu Local Government Area of Niger State (Ayeni, 2007).

### Data collection

The study was conducted in six (6) month from January-June, 2017. Data were collected through the administration of questionnaires. Five (5) communities were purposively selected due to their close proximity to park boundary in the existing support zones communities in Zugurma sector of the park. These communities are: Felegi, Shafinni, Babugi, Fanga and Ibbi. 200 questionnaires were administered to people engaging in farming activities in those communities. In each community a total of 40 questionnaires were administered to forty (40) farmers each. In the course of retrieving the questionnaire out of 200 circulated 174 were retrieved analyzed. Interpreters also assisted in obtaining information from the uneducated respondents. Also visit was made to some of farms during course of study. Information were also gathered from secondary sources of data. Data collected were analyzed through the use of simple descriptive statistics such as tables and charts. The questionnaires were purposively and evenly distributed among the farmers in communities whose farms are close to the park boundaries in the study areas and (87%) of questionnaires were retrieved (Table 1).

**Table 1: Distribution Pattern of Questionnaire during the Study**

Community	Number Distributed	Number Retrieved
Felegi	40	35
Shafinni	40	34
Babugi	40	35
Fanga	40	32
Ibbi	40	38
TOTAL	200	174



**Figure 1: Map of Zugurma Sector of Kainji Lake National Park and support zone communities.**

## RESULTS

The demographic characteristics of the respondents in table 2 indicate that male had the highest percentage (72.4%). It was observed that age category 31-40 years had the highest percentage (46%) while the age category of 51 years and above had the least (10%). Most of the farmers are in their active and youthful age. Married respondents had the highest percentage (52.9%) while Widow/Widower was the least with 15%. From their level of education secondary school certificate holders had the highest percentage (35.6%) while tertiary was the least (12.6%). There was positive correlation between literacy level and farmers' use of recommended practices table 2. Majority (67.8%) of respondents had their farms within a distance of less than 500 metres to the park boundaries while 32.2% had their farms more than 500 metres away from the park boundaries table 3. Respondents experiencing crops raiding in table 4 with most of respondents (72.8%) reported to have been experiencing crop raiding while 21.8% reported no experience of crop raiding possibly due to the distance of their farms to the park. The result in table 5 indicated that 28.7% of respondents had

started farming between 11-20 years while 10.4% of the respondents had been engaged in farming as far as 40 years. The result in table 6 indicated that animal that raid on farms were mostly primates Red patas *Erythrocebus patas* and Tantalus Monkey *Chlorocebus aethiops tantalus* with 44.7% while Bush buck (*Tragelaphus scriptus*), Grimm's duiker *Sylvicapra grimmia* and kob *Kobus kob* were the lowest with 3.3% respectively.

Farmers observations of seasonal raiding of crops in the study area table 7 revealed that raiding of farms were experienced all year round (43.7%) while dry season has the least (27.6%). The result in table 8 shows crops mostly planted by farmers in which maize (*Zea mays*) has the highest with 16.5%, while cassava (*Manihot esculenta*) was the least (2.7%). More so, table 9 reveals that crops mostly raided in the study area, in which maize (*Zea mays*) has the highest (19.1%), while cassava (*Manihot esculenta*) has the least (2.5%). Table 10 shows the perceived level of destruction of crops in the study area in which majority of the respondent reported that raiding activities is high (94.3%), while none of responded that it is low with (0%). This is in agreement with Hill (1997) report that raiding activities of wild animals' farms around protected areas are always highly destructive to farmers. More so, Table 11,

indicated that (72.4%) of the respondents agreed that destruction of properties (fences, livestock) were other damages caused by wild animals apart from crop raiding while the least damages was transmission of disease to people and livestock (3.4%). Respondents' ways of handling or avoiding damages showed that majority of the people guards their farms (58.6%), while 10.4% reported usage of bait/trap to kill the marauding animal was the least table 12. The estimated economic values of farm produce lost to crop raiding table 13 shows that fifty thousand to one hundred and fifty thousand naira (50,000-150,000) were the highest of losses from respondents' views (61%), while the least is one hundred and fifty thousand naira (150,000) above with (1.1%). In table 14, the respondent revealed actions taken by

the park authorities in which majority of respondents (86.2%) reported that no response were taken when wild animals raided their farms, while (13.8%) of respondents reported that park authority responded by compensating them for the damages. Table 15 showed that majority (81.6%) of the respondents support conservation in the study area. While only 18.4% of the respondent did not support the conservation efforts of the National Park in the study area. This revealed that the culture of conservation is been accepted more and people now understand the future benefits of conservation in the study area.

**Table 2: Demographic Characteristics of the Respondents**

<b>Demographic</b>	<b>Number of Respondent</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	126	72.4
Female	48	27.6
<b>Total</b>	<b>174</b>	<b>100</b>
<b>Age</b>		
20-30	40	23
31-40	80	46
41-50	36	20.6
51 above	18	10.4
<b>Total</b>	<b>174</b>	<b>100</b>
<b>Marital Status</b>		
Single	56	32.1
Married	92	52.9
Widow/Widower	26	15
<b>Total</b>	<b>174</b>	<b>100</b>
<b>Education Status</b>		
Primary	46	26.5
Secondary	62	35.6
Tertiary	22	12.6
Non-formal	44	25.3
<b>Total</b>	<b>174</b>	<b>100</b>
<b>Major Occupations</b>		
Farming (only)	98	56.0
Farming & Trading	54	31.0
Farming & Civil Servant	22	13
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 3: Proximity of Farms to National Park Boundaries**

Distance (m)	No of respondents	Percentage (%)
<500M	118	67.8
>500M	56	32.2
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 7: Farmers Seasonal Perception on Crop Raiding.**

Option	Frequency	Percentage (%)
Dry Season	48	27.6
Rainy Season	50	28.7
All Year Round	76	43.7
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 4: Experiences of Crop Raiding by Farmers in the Study Area**

Option	Frequency	Percentage (%)
Yes	136	78.2
No	38	21.8
<b>Total</b>	<b>174</b>	<b>100</b>

Source (Field survey, 2018)

**Table 8: Mostly Planted Crops by farmers in the study area.**

Crops	Scientific Name	Percentage (%)
Maize	<i>Zea mays</i>	16.5
Rice	<i>Oryza sativa</i>	9.0
Beans	<i>Vigna unguiculata</i>	14.0
Soya bean	<i>Glycine max</i>	11.7
Banana	<i>Musa spp</i>	4.0
Melon	<i>Cucumeropsis edulis</i>	12.9
Groundnut	<i>Arachis hypogea</i>	9.0
Cassava	<i>Manihot esculenta</i>	2.7
Yam	<i>Dioscorea spp</i>	5.9
Millet	<i>Panicum spp</i>	14.4
<b>Total</b>		<b>100</b>

**Table 5: Farmers Years of Farming Experience in the Study Area**

Years	Frequency	Percentage (%)
1-20	94	54.0
21-40	62	35.6
40-above	18	10.4
<b>Total</b>	<b>174</b>	<b>100</b>

Source (Field survey, 2018).

**Table 9: Mostly Daided crops in the study area.**

Crops	Scientific Name	Percentage (%)
Maize	<i>Zea mays)</i>	19.1
Millet	<i>Panicum spp)</i>	13.5
Rice	<i>Oryza sativa)</i>	6.7
Beans	<i>Vigna unguiculata)</i>	11.8
Soya bean	<i>Glycine max)</i>	13.7
Banana	<i>Musa spp)</i>	4.5
Melon	<i>Cucumeropsis edulis)</i>	12.6
Groundnut	<i>Arachis hypogea)</i>	9.0
Cassava	<i>Manihot esculenta)</i>	2.5
Yam	<i>Dioscorea spp)</i>	6.7
<b>Total</b>		<b>100</b>

**Table 6: Wild Animals that Raids Farms in the Study Area**

Animal species	Percentage
Primates <i>Chlorocebus aethiops</i>	
<i>tantalus &amp; Erythrocebus patas</i>	44.7
Giant rat <i>Cricetomys gambianus</i>	15.0
Cane rat <i>Thryonomys swinderianus</i>	9.7
Roan antelope <i>Hippotragus equinus</i>	7.5
Warthog <i>Phacochoerus aethiopicus</i>	6.6
Kob <i>Kobus kob</i>	3.3
Ground Squirrel <i>Xerus spp</i>	3.3
Western hartebeest <i>Alcelaphus buselaphus</i>	3.3
Grimm's Duiker <i>Sylvicapra grimmia</i>	3.3
Bush buck <i>Tragelaphus scriptus</i>	3.3
<b>Total</b>	<b>100</b>

Source (Field survey, 2018)

**Table 10: Perceived level of Destruction of crops by Wild Animals.**

Option	Frequency	Percentage (%)
High	164	94.3
Moderate	10	5.7
Low	0	0
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 11: Other damages done by wild animals in the study area.**

Option	Frequency	Percentage (%)
Destruction of properties (fence And livestock)	129	72.1
Transmission of Diseases to Livestock	10	5.8
Transmission of Diseases to People	6	3.5
Destruction of natural Resources (grasses, land, and water)	32	18.4
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 12: Respondents ways of Addressing Damages in the area.**

Option	Frequency	Percentage (%)
Report to park authorities	54	31.0
Bait/Trap and kill the animal	18	10.4
Guard farms & properties	102	58.6
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 13: Economic values of loss by Farmers to Crop Raiding.**

Estimated amount (₦)	Frequency	Percentage (%)
Less 50,000	66	37.9
50,000-150,000	106	61
150,000 & above	2	1.1

## DISCUSSION

The study involved more male respondents. According to Rwelamira, (1996) the right to own land is often determined by traditional community

<b>Total</b>	<b>174</b>	<b>100</b>
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**Table 14: Actions taken by the Park Authority Curb Raiding**

Option	Frequency	Percentage (%)
No response from park	150	86.2
There were responses	24	13.8
<b>Total</b>	<b>174</b>	<b>100</b>

**Table 15: Perception of Respondents on Wildlife Conservation**

Option	Frequency	Percentage (%)
Yes	142	81.6
No	32	18.4
<b>Total</b>	<b>174</b>	<b>100</b>

leaders such as tribal chiefs, and that land is allocated to male family members even if the household practice female-headship. There was positive correlation between literacy level and

farmers' use of recommended practices and it is expected that this will enhance their learning and improve farming techniques that can reduce crop raiding activities. Naughton-Treves, (1998) stated that farms close to park boundary experienced more crop raiding while farms far away receive little or no damage possibly due to its distance and the kinds of crops they cultivate in their farms. But in this study majority of respondents' farms were located closely to the park boundaries. In the course of this study it was observed that most of the support zone communities sector of the park were very close to the park boundary. Adeola, *et al.*, (2017) stated that close proximity to park boundary is one of the main reasons for human-wild conflicts, experience and the kind of crops they farm. The finding revealed that most of the farmers had not less than ten years of farming experience in the areas, this can make their information more reliable based on their wealth of experiences. The findings in this study are in line with Hill, (2000) and Adeola *et al.*, (2017) who reported that primates have the potential to cause large amounts of damage locally, they raid farms more frequently than other species of wildlife do. Farmers' observations of seasonal raiding of crops in the study area revealed that raiding of farms were experienced all year round while dry season has the least. This is contrary to Sillero-Zubiri, (2001) who reported that crop raiding is greater during harvest season (dry season), but it does occur throughout the year. The findings on crop species commonly raided by wildlife species are in agreement with previous findings. Sitati *et al.*, (2005) and Adeola *et al.*, (2017) which stated that certain crops such as maize, banana, and passion fruits are favored food of primates' crop raiders while others such as cassava and sweet potatoes were mainly raided by bush pigs, rodents and other wild animals. Prasanna (2015) also reported that crop particularly maize, rice and various types of vegetables and cereals grown in fields close to or within 10 km of the water bodies inhabited by hippopotamus are those at risk. Finding on perceived level of destruction was very high. This is in agreement with the report by Hill (1997), Naughton-Treves, (2001); and Wambwa, (2005) which stated that crop raiding by wildlife is a problem of most rural African communities which has led to incidences of loss of human life, injury to

humans, destruction of crops and farm infrastructure. Respondents' ways of handling or avoiding damages showed that majority of the people guard their farms, while the use of bait/trap to kill the marauding animal was the least. This corroborates the finding of Sillero-Zubiri and Switzer (2001) that chasing crop raiders, guarding, scarecrows, plastic flags, use of scents, fences, hunting, trapping and poisoning were some of the methods used in minimizing crop raiding. Lumbonyi, *et al.*, (2017) stated that to protect their farms from wildlife he suggested that community awareness, voluntary relocation, intensifying human vigilance, guard animals, fencing of farms and use of non-coherent sounds.

Economic losses to farmers in the study area range between fifty and one hundred and fifty thousand Naira. This observation is similar to the report of Damiba and Ables, (1993) that confirms this view that production of highly palatable and nutritious seasonal crops such as maize, which attracts primates and other wild animals, involve heavy losses and therefore high guarding investments.

There was a low level of response to respondents' reports of crop raiding to the Park management although there were few reports of compensation to some people. This finding suggests that there will be need for a better synergy between support zone communities and park authority in order to achieve conservation objectives. But on the contrary, perception of communities towards continuous conservation of wild animals in the park showed that majority of the respondents support conservation in the study area. This revealed that the culture of conservation has been accepted more and people now understand the future benefits of conservation in the study area.

## CONCLUSION

This study has established that there is a huge economic loss to these agrarian communities which may invariably have a negative impact on wildlife population and resources due to preventive and retaliatory mechanisms that were being employed by the farmers on their crops against any raiding activities by wild animals. There was a low level of responses to respondents' reports of crop raiding to the Park management. This suggests that there will



be need for a better synergy between support zones communities and park authority in order to achieve

conservation objectives. These findings should be given more research attention for posterity sake.

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