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WARTHOG-HUMAN CONFLICTS IN BORGU SECTOR OF KAINJI LAKE NATIONAL PARK, NIGERIA

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ABSTRACT

This study assessed the impacts of common Warthogs (*Phacochoerus africanus*) on farm crops around Borgu sector of Kainji Lake National Park, Nigeria. Data was obtained with the aid of structured questionnaire in six communities which were purposively selected (Woro, Kemenji, Worumakoto, Maji, Venira and Kanikoko) and questionnaire was randomly administered to the identified farmers. The sample size was put at one hundred and twenty (120) respondents, of which eighty one (81) questionnaires were retrieved. The demographic characteristics of the respondents indicated that age group 31-40 years recorded the highest (39.5%). The finding further revealed that 64.2% of the respondents are Muslim and 65.4% are married. Also majority of the respondents (53.1%) had stay in the study area between 6-10 years. Majority of the respondents agrees that there is presence of Warthog around their farms. The types of crops cultivated by the respondents are Maize, Guinea corn, Rice etc. Majority of the respondents indicated that they have experience crop raiding by Warthog. Types of crops preferred by Common Warthogs showed that Maize is the most preferred. The season of intense crops raiding is the raining season. The various preventive method used by the respondents to prevent Warthogs crop raiding are watch guarding, scare crow and fire/smoke. The possible solution as suggested on how to prevent Warthog-farmers conflicts are compensation and employment. This study confirms that Warthog has an impact of farm lands in the study area by causing much damage on farmer's crops.

Keywords: Borgu, Conflict, Human, Warthog

INTRODUCTION

Conflicts in wildlife conservation are those negative experiences that human receives from wildlife animals, with undesirable consequences both for people and their resources, on the one hand, and wildlife and their habitats on the other. Human-wildlife conflicts are escalating and have become a significant issue in conservation and land management of a protected area. Human-wildlife conflicts may include a wide range of situations, the scope of which makes it difficult to stipulate what precisely constitutes a case of human-wildlife conflict. There are many conflicts in biodiversity, but not all of these are human-wildlife conflicts. Given the range of perspectives on the issue, it is difficult to distil the issue into a single-sentence definition that is inclusive, comprehensive, precise, succinct, and user-friendly. Although a strictly delineating definition may not be essential, a common understanding of the essence of the issue and its main characteristics is important for progress and collaboration among agencies and actors involved in this topic (Hudson and Cattadore, 2006; IUCN, 2020). Human-wildlife coexistence is really a complex, dynamic and context-dependent issue. While desiring to coexistence with wildlife is the major goal of conservationists, this usually may not be the objective of people affected by wildlife (IUCN, 2022a). Sometimes, serious impacts−on the livelihoods, security and wellbeing of the people from whom the conservationist seek support for wider conservation goals− have adversely affected by the human-wildlife conflicts (IUCN, 2020). Increase in human population especially around protected areas emboldens direct competition for natural resources within the protected area landscape and creates continuous conflicts between people living within support zone communities and other biological resources (Ogunjobi and Adeola, 2016).

The IUCN SSC Position Statement on the Management of Human-Wildlife Conflict "urges governments, non-governmental organisations, researchers, practitioners, community leaders, environmental agencies, and others to ensure that efforts to manage human-wildlife conflicts are pursued through well-informed, holistic, and collaborative processes that take into account underlying social, cultural and economic contexts (IUCN, 2022b).

The increase in human population especially at support zone near the protected area usually forced expansion into protected areas for agricultural farmland. This in turn forces wildlife to modify their habitat into the farmland (Forthan, Quick and Demment, 2005). Knowing fully well that large herbivores are key components of terrestrial biomes considering the way they structure the habitat and influences ecosystem functioning one can concur with the submission of Bayani *et al.* (2016) that crop damages by wild herbivores close to wildlife protected areas is a serious problem that can potentially undermine conservation efforts. Competition for food between human and wild animals can have significant impact on agricultural yields, human nutritional status and conservation status of some wildlife species (Fuentes, 2006).

Common Warthog (*Phacochoerus africanus*) is found in many parts of sub-Saharan Africa. They are typical open country species, as evidenced by characteristic grazer morphology and behavior. Though they are mostly grazers, their diet is not restricted to grass, such as roots, fruit, and small mammals, reptiles, and birds. They are restricted to various types of savanna grasslands, open bush lands, and woodlands, usually not far from nearby water source (d'Huart *et al.*, 2011). Common warthogs (*P. africanus*) are inhibited on the savannah grasslands in almost all of Africas sub-Saharan countries (Berger *et al*., 2006). Warthogs have missing in some areas where the human population is growing and are therefore in some countries found only in reserve areas (Muwanika *et al*., 2006). They are non-migratory and vigorous during the day and they sleep in holes commonly abandoned by other animals during the night (d'Huart and Grubb, 2001). Females live in small family groups with their offspring and the males live lonely or in single groups (Berger

et al., 2006). Wildlife protection is a complex challenge currently being faced by the conversationalists around the world (Eniang *et al*., 2011).

According to IUCN, (2022a), rich diversity of currently developing ideas on coexistence, it may be best to mobilized as a flexible concept to enable diverse research disciplines, as well as non-researchers, to collaborate on mutual challenges and learning to resolving the human wildlife conflict for a sustainable biodiversity conservation. This research work is to investigate conflict associated with warthog and human in support zone villages around the Borgu Secort of Kainji Lake National Park. The general objective of the study is to assess the raiding activities of Warthog in the study area with the view to identify the crops mostly raided by Warthog and the method of controlling damage done by Warthog in the study area.

METHODS OF DATA COLLECTION

Description of the 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).

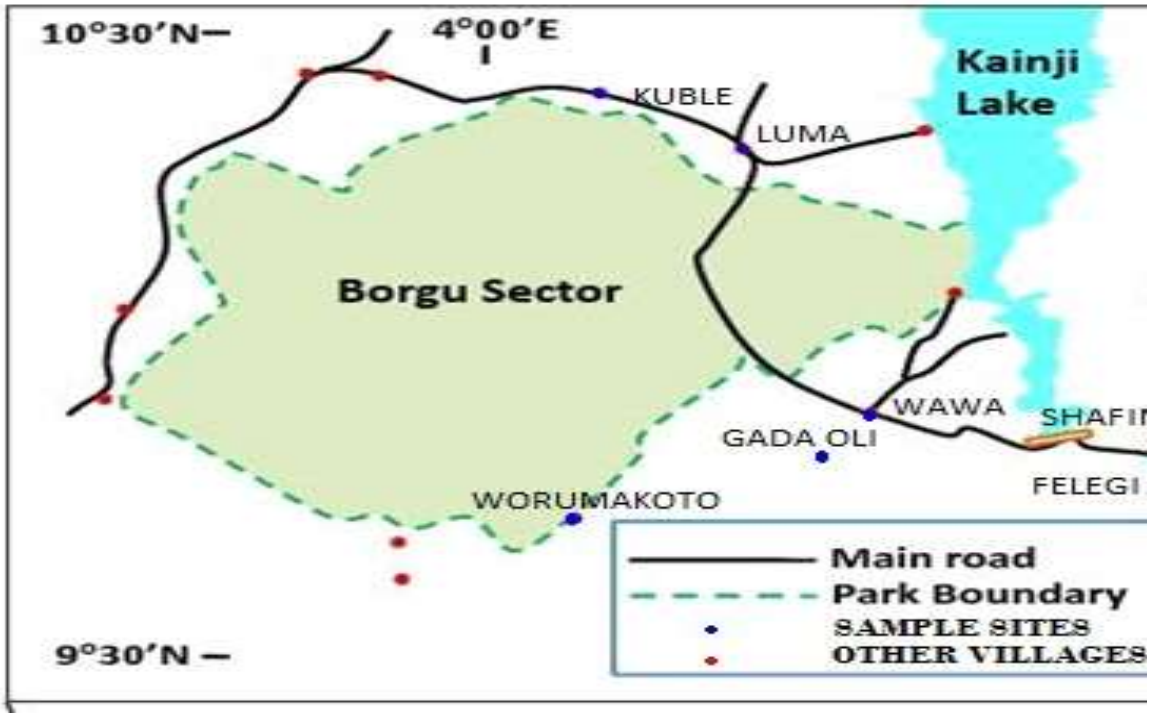

Figure 1: Map of Kainji Lake National Park (Borgu Sector) . *Source (Ayeni, 2001)*

Kainji Lake National Park is located in the North West 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).

The major features of the climate of the park are the wet and dry seasons which vary from the 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 Borgu Sector varies from 1,100mm in the trends surface analyses of the mean annual rainfall in the sector. All plants growing in a specific area constitute the vegetation of the area. The vegetation of the park varies from one sector to the other. The Borgu sector vegetation is more of a transitional vegetation between the Sudan and the Northern Guinea savannah types (Ezealor, 2002).

Data Collection

Data was obtained with the aid of structured questionnaire in six communities: Woro, Kemenji, Worumakoto, Maji, Venira and Kanikoko. These communities were purposefully selected because they were support zone villages nearest to the parks were purposively selected and questionnaire was randomly administer to the identified farmers. The sample size was put at one hundred and twenty (120) of out which 81 were recovered.

Data obtained were analyzed using description statistics in form of percentages, frequency of counts, table.

RESULT AND DISCUSSION

The demographic characteristics from table 1 shows that 93.8% of the respondents were male and 6.2% were female. The highest respondents were within the age group 31-40 years (39.5%), followed by 33.3% between the age group 41-50 years. While age group 21-30 and 51 years and above 19.8% and 7.4% respondents respectively. 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. The level of education of the respondents shows that 38.3% had primary education, secondary education 27.2%, non-formal education 23.6% while tertiary education was the least with 11.1%. The household size ranges between (50.6%) and 11 and above household size 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%. The presence of warthog around the farmland was noticed by 76% of the respondents while 5% did not notice the presence of warthog as shown in figure 2.

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 Status	Married	53	65.4
	Unmarried	28	34.6
Level of Education	No formal education	19	23.6
	Primary education	31	38.3
	Secondary education	22	27.2
	Tertiary education	9	11.1
Size of Household	1-5	41	50.6
	6-10	37	45.7
	11 and above	3	3.7
Length of Residency (Years)	1-5	21	25.9
	6-10	43	53.1
	11 and above	17	20.9
	Total	81	100.0

Source: Field Survey, 2021

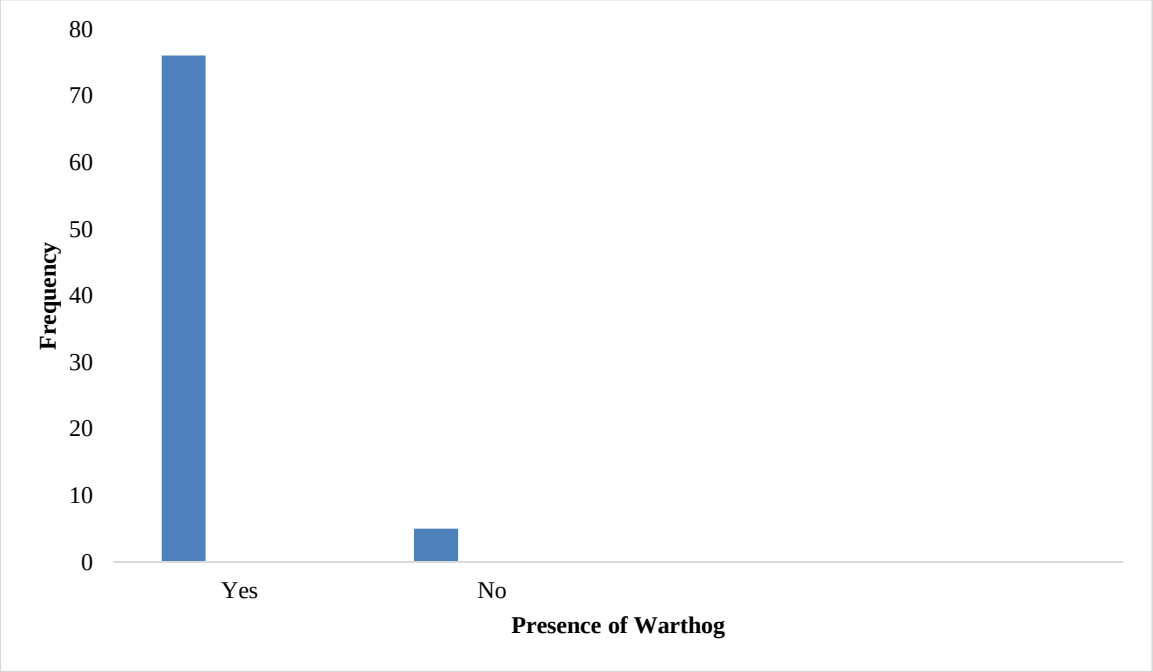

Figure 2: Present of Warthog around Farms in the Study Area

The types of crops cultivated by the respondents in the study area are: Maize, Guinea corn, Rice, Millet, Ground nut, Beans and Sorghum. From figure 3, 69% of the respondents indicated that warthog normally raid crops in their farmland while 12% indicated no crop raiding. From table 2, 33.3% of the respondents complaint that warthog raided the most Maize on their farmland, Rice (29.6), Ground nut (30.9%, Beans, Guinea corn, Millet (7.4%, 4.9% and 2.5% respectively) while 1.2% respondents indicated Sorghum has been the least raided by warthog.

From figure 4, 21% of the respondents indicated that warthog had very severe damage to their crop, 41% of the respondent indicated much damages (moderate damage) while 13% of the respondents with little or minimal damage. Table 3 however showed that much damage was recorded in the raining season (58.0%) than during the dry season (18.5%). Crop raiding as indicated by the respondents at both season was 23.5%.

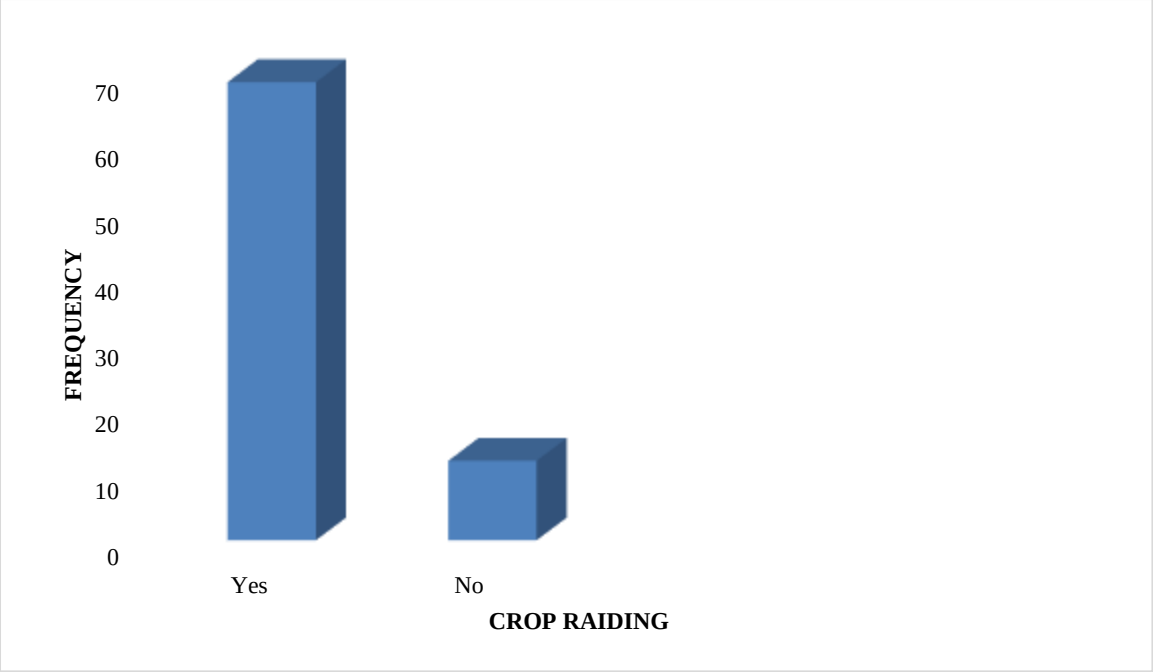

Figure 3: Crop Raiding By Common Warthogs

Table 2: Types of Crops Preferred by Common Warthogs

Crops	Frequency	Percentage (%)
Maize	27	33.3
Guinea Corn	4	4.9
Millet	2	2.5
Rice	24	29.6
Groundnut	17	20.9
Beans	6	7.4
Sorghum	1	1.2
Total	81	100.0

Source: Field Survey, 2021

Table 3: Seasons of the Year Warthog Crop Raiding are most experienced in the Study Area

Season	Respondents	Percentage (%)
Raining Season	47	58.0
Dry Season	15	18.5
Both Season	19	23.5
Total	**81**	**100.00**

Source: Field Survey, 2021.

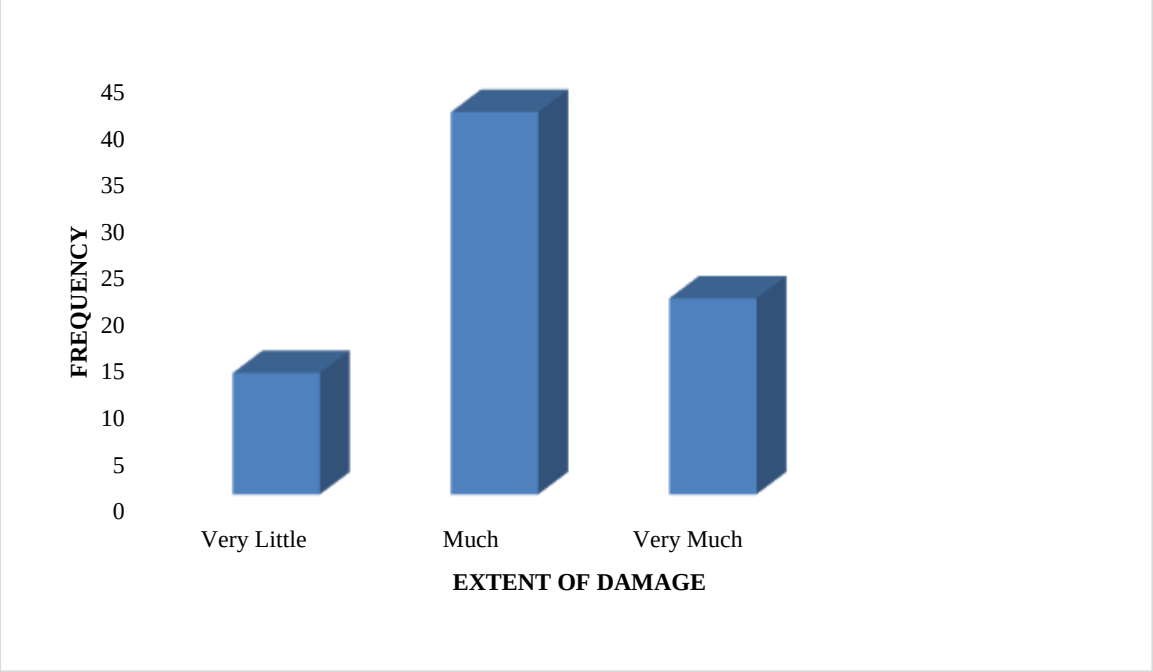

Figure 4: Extent of Crop Damage by Common Warthogs

The various preventive methods as shown in table 4 being adopted by the farmers to prevent warthog raiding on their farmland includes: the use of watch guarding (27.2), scare crow (23.5%), hunting (16.0%), trapping (13.6), thorn fencing (11.1%) while fire and smoke (8.6%). Table 5 shows that among the respondents 53.1% believe that the population of the warthog has been reducing, 25.9% still believes that there had been no changes in the population while 20.9% believe that the population is on the increase.

Table 4: Preventive Measures Taken Against Common Warthogs Invasion

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**

Source: Field Survey, 2021.

Table 5: View of Respondents on Common Warthogs Population

Population	Respondents	Percentage (%)
Increases	17	20.9
Stable	21	25.9
Decreases	43	53.1
Total	**81**	**100.00**

Source: Field Survey, 2021.

Table 6: Possible Solution suggested by respondents on how to prevent Warthog-farmers Conflicts

Variable	Respondents	Percentage (%)
Killing	4	4.9
Compensation	44	54.3
Employment	31	38.3
Translocation of People	2	2.5
Total	81	100.0

Source: *Field Survey, 2020.*

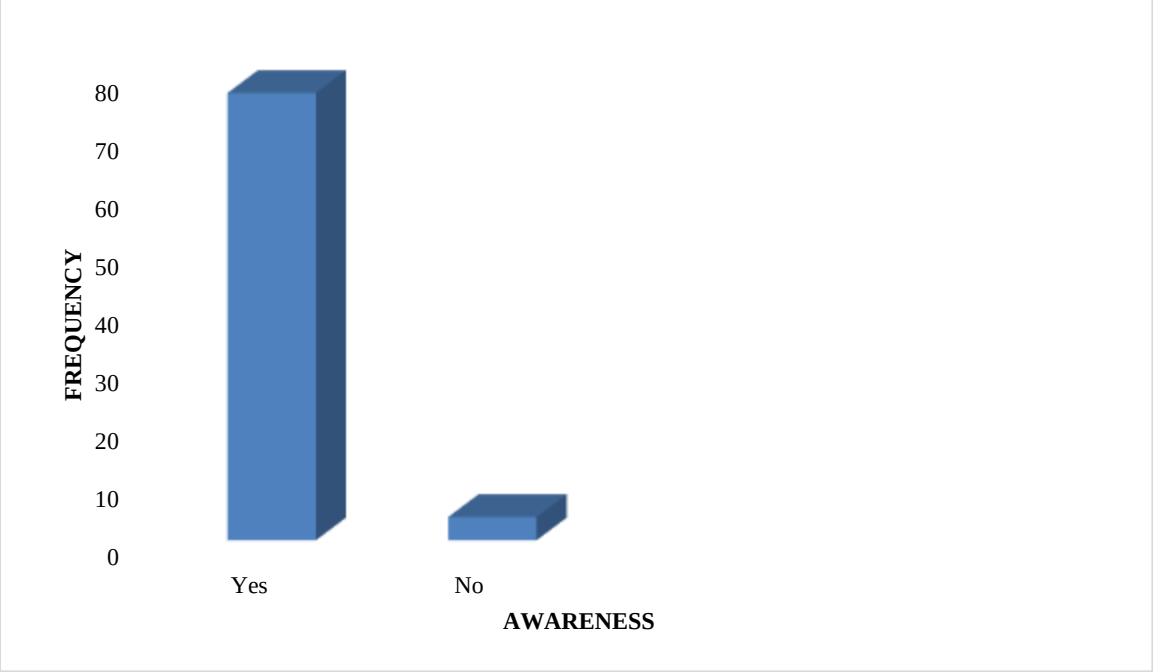

Figure 5: Awareness of Crop Raiding Activities of Warthog by Park Management

Table 6 revealed the possible solutions being suggested by the respondents on how to prevent Warthog-farmers conflicts; more of the respondents are willing to opt for compensation (54.3%), 38.3% for employment, 4% are willing to kill the animal and only 2.5% of the respondents are willing for translocation. Figure 5 however showed that 77% of the Park management was aware of crops raiding activities by Warthog in the study area.

DISCUSSION

In many parts of Africa, conflict between local people and wildlife is due to competition for resource control between people inhibiting adjacent places to reserve areas. As a result protected areas are repeatedly under threat from growing human population (Newmark, 1994). The present study also showed that the people within and around the study area are farmers who entirely depend on subsistence agriculture for their livelihoods. The complaints of warthog damaging their crops like maize, Guinea corn, Rice is similar to the report of IUCN (2020) who reported crop raiding as one the conflicts human encounters with wild animals. The study further corroborate the finding of Hoare, (1992), Eltringham, (1993) and Ertiban (2016) who also confirm that major reason for conflicts between farmers and wildlife animal has been the issue of crops raiding by these mammals. Majority of the respondents perceived the damages caused by warthogs is having a serious effect on their livelihood. This harmful perception is in line with Joséline (2010) and Edward and Frank (2012) who reported increased habitat disturbance has caused human wildlife conflict in Uganda. Dixon, (2005) reported anthropogenic habitat change causes crop raiding in Southeast Sulawesi, Indonesia by primates; this is the case with the respondent in the support zone of Borgu Sector of Kainji Lake National Park. Crop raiding has caused farmers to develop negative attitude towards wildlife conservation particularly those living close to the protected area. This explain the reason they are opting for compensation and employment as a means to encourage them in their support for continuous involvement in conservation of the protected areas. And has opined by IUCN (2022), that coexistence is a complex issue that requires flexibility if conservation of both available and endangered−threatened species must be achieved; suggestion from the respondent in the support zones must be factors to be consider when drawing policy on conservation of the protected areas.

Wildlife animal have taste for specific food, report has shown that many of the wildlife herbivore prefer cultivated maize to other type of crops as shown by the works of Mkanda and Kumchedwa (1997), Kendall (2011) and Ertiban (2016) whose studies revealed that maize and rice were the sort out crops being raided by wild animals. Some crops might be found palatable and attractive for wildlife, according to Bonham *et al* (2007), among plants adjacent to Kakum National park (Ghana) maize and cassava were more attractive in particular to elephants. The present study also confirmed the same situation in the study area, in which maize were highly preferred by warthog as revealed by the respondent being the most damaged crops. The pest animal showed preferences also for Rice and groundnut among the cultivated crops in the area. The communities utilized deferent methods to protect their farm from damages caused by pests. Guarding was the common approach being used it only suggest the cooperation the communities are willing to give to the Park authority vis-à-vis awareness that the park authority might have made amongst the communities. However as shown form the result that higher percentage of the respondents indicating that the population of the warthogs have reduce may suggest that killing may be carried out at night when the farmers feels more threaten about his livelihood. More so watch guarding being the most adopted by the communities may result to hunting down the warthogs at night than during the day. In addition scare crow, traps and hunting was also observed as means of controlling the activities of warthogs in the study area. Antagonistic behavior of local people towards wildlife conservation and low level literacy can aggravate the local people to have negative perception towards wildlife conservation especially when their livelihood is threatened.

More disturbance of warthog during the raining season is in agreement with Thorton *et al*. (2006) who reported that wildlife disturbances are widely distributed during raining season from the reserve into the nearby field because of

variability, availability of food, characteristic of choice crops and distance from the forest are important factor for crop riding.

Human-animal conflict is a critical point in conservation of species, without local support for conservation the biodiversity will decrease (Sitati *et al*., 2005). There is some evidence suggesting that local communities are more likely to comply and to commit themselves to long term conservation strategies when their knowledge and opinion are incorporated into protected area decision making process (Mascia, 2003). On the other hand, others have suggested that enforcement is the cornerstone for the success of conservation in protected areas (Lock and Dearden, 2005). The continuous farming close to protected areas will continue to invite wild animal, and resulting conflict resolution may not be in sight any soon. To get this under control as pointed out by IUCN (2022a) that it may be best to mobilized a flexible concept to enable not only diverse research disciplines, but also non-researchers, to collaborate on mutual challenges and learning, thereby proffering a more robust solutions, which will take into account all the players for a sustainable conservation programme.

CONCLUSION

The study confirms that Warthog has an impact on farmlands in the study area by causing much damage on farmer's crops. The crops being cultivated by the respondents are Maize, Rice, Groundnut, Millet, Guinea corn, Beans and Sorghum. Maize was considered as the highest vulnerable crop that is being damaged and the preventive measures mostly adopted against Warthog invasion by the respondents is watch guarding. To bring sustainable wildlife management and rural community development in the study area, it requires reconciling the interest of stakeholders with the park management objectives.

RECOMMENDATION

It is therefore recommended that:

1. Victims of wildlife attacks in the surrounding communities should be compensated.
2. Poverty alleviation program should be initiated and employment should be given to the communities
3. If possible, farm land should be relocated far away from protected areas.
4. Continuous awareness on the benefit of coexistence between the people in the support zone and the park be carried out not ruling out their interests.

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