

The economic loss from Hippopotamus (*Hippopotamus amphibious*) encroachment on farm lands in three Local Government Areas of Benue State, Nigeria

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ABSTRACT

A study of the menace on agricultural crops was undertaken in parts of three local Government areas of Benue State, along the river Katsina-ala, Nigeria. Using Structured Questionnaire involving the identification of the villages found along the study area, the crops cultivated by the people, the number and sizes of the farms and areas destroyed by Hippos. Data collected were analysed using descriptive statistics (tables, chart and percentages). The estimated loss in economic terms of such destroyed crops was computed and the various measures employed by the farmers to scare the Hippos from their crops were also identified. Seven crops (rice, maize, guinea corn yam, sweet potato, cassava and groundnut), were cultivated by the farmers. Out of the 129 hectares put under cropping, 10 hectares were destroyed by Hippos leading to a loss of approximately ₦22, 456,290. The damage done to arable crops was highly significant irrespective of the crop type. It is suggested that immediate and intensified control measures be put in place, through protection techniques to reduce or absolutely eradicate further damage.

INTRODUCTION

Hippopotami (*Hippopotamus amphibious*) are believed to have originated from Africa or Asia. They are of pig-like ancestor based on evolutionary believe and are nocturnal animals (Glen, 2005). They occur in close association with water in lakes, rivers, streams and swaps throughout savanna zone of Africa and main river in forest zone in central Africa (Dunstone and Gorman, 2007; Buba *et al.*, 2013). They have two essential requirements; water in which to submerge and nearly grassland and other agricultural crops for foraging (Jablonski, 2004).

Common Hippopotamus (*Hippopotamus amphibious*) is the third largest herbivores African mammal next to African elephant (*Loxodonta africana*) and rhinoceros

(*Diceros bicornis*). Hippos have sustained impacts on wetland vegetation due to their large body size, habitat and food requirements (Chansa *et al.*, 2011) and pose physical threats to local communities (Kanga *et al.*, 2011c). The increase in human population especially in the developing countries has demanded that all land areas be put under cultivation for food production and consumption. This agricultural practice naturally encroaches into wild lands. Onyeausi, (1988) reported that the common activities of rural communities, which include fire-wood gathering, hunting, fishing and indiscriminate burning often conflicts with wildlife resources and conservation.

According to Sefi, (2016) assessment of human-wildlife conflict is an important way to assess the sources and impact of

human/wildlife on the environment at large. The constriction of wildlife habitat resulted in severe competition for natural resources between wild animal and the local communities. These in turn result in wildlife-human conflict creating economic losses on agricultural products of the local communities.

Hippo-human conflicts are reported in from several countries in Africa including Nigeria. Most records referred to crop raiding/losses, attack on fishermen by destroying their canoes/nets and human life (Dunn, 1999). They often cause great damage (economic losses) than the other common agricultural pest because their raids are unpredictable. Human-wildlife conflict has been in existence for as long as humans and wild animals have shared the same landscapes and resources. However, conflict occurs when wildlife requirements encroach on those of human populations, with costs both to residents and wild animals (IUCN, 2005).

Conversely, wild animals may damage agricultural crops, stored products, fences and houses of settlement contiguous with game areas, and may even attack their human neighbours thus imposing severe economic and livelihood hardship on individuals and families (Onyeausi, 1988). According to Happold (1973) wild animals damage crops in local farms and pollute water bodies (Christopher, 2012). Wammanda (1995) reported that because of their enormous food requirement, hippos may be destructive to vegetation if they become too numerous. According to Kaswamila *et al.*, (2008), conflicts between human and wildlife are a growing problem. People kill wild animals to retaliate the destruction of crops, competition for land and water resources.

This study aims to identify the various arable crops damaged by hippos, determine the extent of such damages, and assess the economic loss to the farmer and

strategies in preventing Hippo crop damages.

MATERIALS AND METHODS

Study area

The study was conducted in some parts of three Local Government Areas of Benue State, Nigeria, which are Ushongu, Kwande and Kastina-ala, all lying along the River Kastina-ala basin. The mean annual temperature ranges between 28⁰-30⁰C while the mean annual rainfall ranges between 100cm – 200cm (Iloeje, 1981). The wettest months are August and September. The vegetation is typically guinea savanna, with abundant woody plants species and grasses.

Data Collection

The study area was stratified into five villages namely; Mbaataka, Mbaalom, Mbanyieh, Mbaranku and Utege/Shiakpev based on their proximity to the Katsina-ala river. Structured questionnaires were employed. In each village, the various crops cultivated by farmers were identified and the farm sizes were measured using a measuring tape. The quantity of harvested crops were measured as well as the estimation of the expected quantity of harvest assuming there were no hippo damage through extrapolation of land area destroyed.

The areas of the damaged crops were also measured and the standard measurement of 50kg of a crop market measurement was adopted. The data was computed using simple descriptive statistics (tables, percentages and figures).

RESULTS

The result on the number of farms, total area cultivated (M²) and total area damaged by Hippos per village is presented in (Table 1). It revealed that Utege/Shiakpev had the highest number of

farms (42), but Mbanyiegh had the highest total farm area (M^2) cultivated. However, Mbataka had the higher total area of damaged farms by Hippos (37, 5000 M^2). Seven (7) crops were cultivated in each of the five sampled villages and the major crop cultivated was rice (28%) farmers involved and the least were sweet potato and yam (7%) (Fig 1).

Table 2 indicated the harvested yield (kg) of the seven (7) crops cultivated. The result showed that Mbanyiegh village had the highest harvested yield (kg) of rice crop among other villages while Utege/Shiakpeve village showed the highest range of harvested yield (kg) for both

maize, guinea corn, cassava, groundnut and sweet potato respectively. However Mbaalom village indicated higher harvested yield (kg) for yam.

Table 3 revealed the quantity of crop damaged (kg) and the monetary value both in Naira and Dollars. Rice crop had the highest percentage (36%) of quantity of yield destroyed as shown in the monetary value attach to it and the least was sweet potato (1%). Measures taken by farmers to wade off hippos is presented in (Table 4) which showed that the use of fire was common (32.8%), followed by scare crows (23.9%) and no control indicate zero percent.

Table 1: Number of farms in each of the five (5) villages, total area of farms and area of Hippo damaged

Villages	Number of Farms	Total Farm area M^2	Total area damaged by Hippos
Mbaataka	34	361,250	37,500 m^2
Mbaalom	34	397,500	20,750
Mbanyiegh	30	425,000	17,875
Mbaranku/Jemba/Yegh	35	237,500	15,625
Utege/Shiakpeve	42	247,500	11,625
Total	175	1,668,750	103,375

Source: Field work, 2016

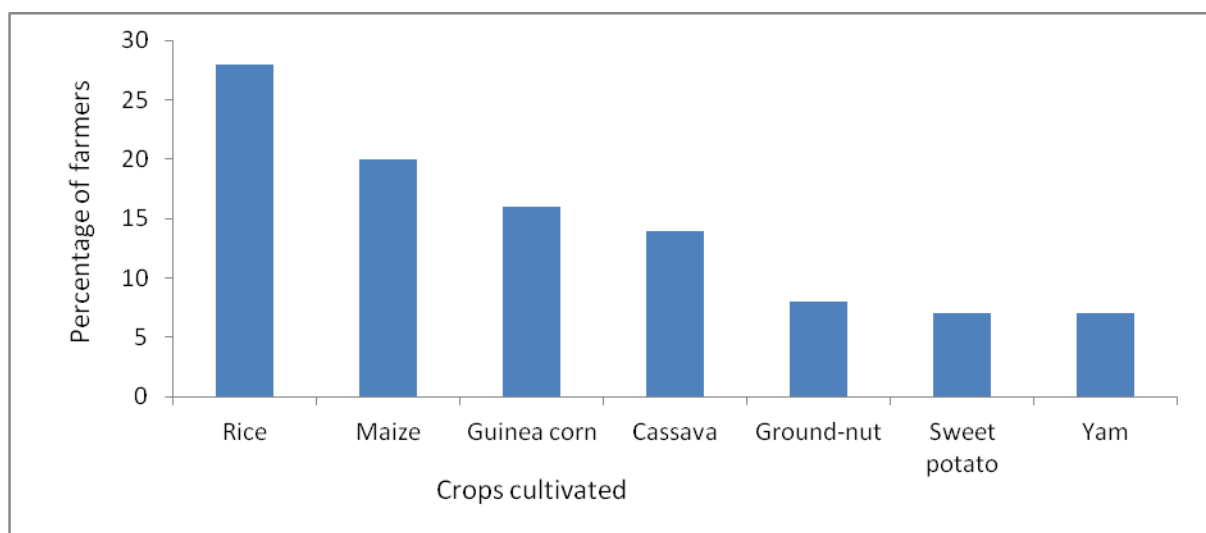


Fig 1: Seven crops cultivated by farmers in the five villages

Table 2: Observed harvested yield (Kg) of seven crops cultivated in the five (5) villages

S/No.	Villages	Rice	Maize	Guinea corn	Cassava	Ground-nut	Sweet potato	Yam
1	Mbaataka	5,825	1,750	6,175	3,200	2,600	100	50
2	Mbaalom	7,500	2,250	2,850	3,500	102,000	400	1000
3	Mbanyiegh	16,400	2,400	3,250	6,100	1,600	200	900
4	Mbaranku/Jemba/Yegh	8,000	7,150	8,050	6,000	3,000	750	50
5	Utenge/Shiakpev	10,800	16,215	8,100	10,508	5,750	1,100	540
	Total	48,525	29,715	28,425	29,08	114,950	2,550	2,540

Source: Field work, 2016**Table 3: The various crops, the quantity destroyed and the monetary value in Naira and Dollars**

S/No.	Crops	Quantity Destroyed (Kg)	%	Monetary Naira (₦)	Value Dollars (\$)
1	Rice	62,625	36	8,767,500	56,564
2	Maize	19,400	11	3,104,000	20,025
3	Guinea Corn	17,100	10	2,394,000	15,445
4	Cassava	16,233	9	2,110,290	13,614
5	Ground-nut	53,600	31	5,360,000	34,580
6	Sweet Potato	1,850	1	74,000	477
7	Yam	4,310	2	646,500	4,170
	Total	175,018	100	22,456,290	144,875

Source: Field work, 2016**Table 4: The various measures employed by the farmers to wade off the Hippos from their farms**

S/No.	Control Measures	Number of Farmers Using it	(%)
1	Use of dane guns	10	6.45
2	Use of fire	50	32.26
3	Use of drum	15	9.68
4	Use of scare crows	37	23.87
5	Use of gongs	18	11.61
6	Use of stones	25	16.13
7	No control	0	0
		155	100

Source: Field work, 2016**DISCUSSION**

The knowledge on the economic loss posed by hippo among other wild animals is crucial for evaluating the damage/cost involved in food production among the local communities.

The findings of the study indicated that seven arable crops were cultivated by the farmers in the study area. The Utenge/Shiakpev village had the highest number of farmers (42), however

Mbanyiegh had more area under cultivation than any other villages. In terms of area of farmland destroyed by the hippos, Mbataka village had the highest area of farm area destroyed (37,500m²).

The largest quantity of crop damaged by the hippos is rice, followed by Ground-nut, maize respectively, the least was sweet potatoes. Understandably, rice is cultivated along the banks and flood plains of the

river Katsina-ala and will be reached easily by the aquatic hippos. The preference is therefore due to proximity to the water body which is its natural habitat. Estes, (1997) reported that hippos can ingest up to 60kg of food in a night of grazing trip and that they may travel far on land such for crops such as ground-nuts cassava, maize, yam and others.

Feeding is usually at night and may take up to five hours; this is in consonance with the report of Kingdom (1997) who said hippos need more than 5 hours out of the water for feeding purposes. According to Estes and Otte (1991) hippos may be destructive to vegetation on land if they become too numerous. In each of the five (5) villages, no more than five hippos had been sited. However, the destruction caused to agricultural crops is staggering. A total of ₦22, 456,290 (\$144,875) worth of cash crops were damaged in the study area within a year. Apart from this gross economic loss to the people marauding hippos also disrupt the people's activities by obstructing children from going to school. Use of fire and scare crows by the farmers were common normally as a result of night feeding by the hippos to scare them away. From all indication, the damage done to arable crops were highly significant irrespective of the crop type.

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