

ANALYSIS OF NILE CROCODILE (*CROCODYLUS NILOTICA*) HUNTING IN SELECTED COMMUNITIES AROUND FRESH WATER AND SALT WATER TRANSITIONAL AREAS OF RIVERS STATE, NIGERIA

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ABSTRACT

Nile crocodile (*Crocodylus nilotica*) is threatened and the rate of its hunting and the vulnerability ranking of the species on basis of size or age is unknown in Nigeria, particularly in coastal areas. Analysis of *C. nilotica* hunting was therefore conducted in Choba, Aluu, Abonema and Emohua, being communities located around the fresh water / saltwater transitional river, with the aim of determining the most vulnerable stage of the species in the study area. The study was conducted from January 2008 to December 2010. Structured questionnaires, field observations and in – depth interviews were used for the study. Through the chairman of fishermen / hunters association all fishermen and hunters operating in selected communities who had ever caught crocodile were identified and catches of *C. nilotica* were monitored on monthly basis throughout the period of study. A set of questionnaire were administered to all the fishermen/hunters in the study area. In all, a total of 70 fishermen/hunter respondents were interviewed to confirm data obtained between 2008 and 2010. Data obtained were analysed using descriptive statistics in form of frequency, percentages, means, pie chart, bar chart and graph. Results revealed that a total of 3206 crocodiles were caught by 70 fishermen in the study area between 2008 and 2010. The rate of hunting was higher in Abonema and Emohua within the studied period. Mean monthly catches in 2008, 2009 and 2010 were 33, 37 and 33 respectively for Abonema. Numbers of catches decreased progressively between 2008 and 2010 in Abonema and Choba. The juveniles were more vulnerable to be caught in the study area than sub adults and adults, and were mostly caught during dry season (83%) by chance (61%) through entanglements in fishing nets as they stray out to feed. About 54.6% of fishermen and hunters mostly caught juveniles, 32.6% mostly caught sub adults while only 12.8% mostly caught adults. Fishermen find the adults difficult to handle because they can tear fishing nets. The juveniles were mostly caught by fishermen as hunters normally set traps at strategic locations for adults. Catches were mainly for consumption. Unregulated exploitation of juveniles from the study area will drastically reduce population of the species as there is no legislation regulating hunting of crocodile at any stage. With time it will be difficult for an adult *C. nilotica* to be found in the study area and breeding will stop when existing adults die without replacement as the juveniles could not be allowed to survive to adult stage.

Key words: Wildlife conservation, Crocodile exploitation, Rural households, Endangered species, Nigeria

INTRODUCTION

One of the most serious global challenges is the sustained utilization of limited natural resources in the face of ever increasing human population. This is worse for countries like Nigeria with high rates of poverty, where the governments are nonresponsive to the needs of the people, and the majority of the people heavily rely on natural resources for survival (Ijeomah 2007; Ijeomah and Emelue 2009). Man has been the greatest threat to natural resources or wildlife conservation as Ogogo (2008) has emphasised that 'Except under the most extenuating circumstances, no predator except man is

capable of exterminating a prey species''. Human's activities that have posed extinction threats to wildlife species includes; habitat destruction, environmental pollution, poaching and heavy hunting, and among all human's activities listed above heavy hunting ranked as one of the greatest threats to Nile crocodile (Fergusson 2010).

More than 750 surveys using variety of methods have been carried out on *Crocodylus niloticus* (Nile crocodile) since 1950s. Despite covering 315 different locations only 8 of these have been surveyed enough to allow estimation of population trends (Lainez 2009). All of the-

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hunters.

The numbers of questionnaires distributed for different categories of respondents in each selected site is shown below in Table.1:

Table 1: Number of respondents in selected communities

Abonema	Aluu	Choba	Emohua	Total
23	12	12	23	70

Data Collection

The methods used for the collection of data for the research work were basically in three ways; pre- tested structured questionnaires, field observation, and personal interviews depending on the objective to be achieved. Classification of crocodile by Hutton (1989) and Wikipedia (2007) into various sizes as juvenile ≤ 1.2 m (< three years), sub-adult > 1.2 m band < 4m (<ten years) and adult >4 and ≥ 8m (11 -100 years) was adopted.

Data Analysis

Data obtained from the study were analysed using descriptive statistic in form of counts of frequency, bar chart and Pie chart. Total numbers of catches for each year was gotten from the addition of all catches made by fishermen/hunters in each year. Rate of hunting in selected communities on monthly basis were arrived at by dividing total numbers of catches in a year (annual) by 12 months. The average numbers of crocodile caught by fishermen/hunters in each community were calculated by dividing the numbers of total catches with the numbers of fishermen/hunters in that community.

RESULTS

Hunting Rate of Nile Crocodiles

The total numbers of crocodile caught among fishermen / hunters sampled in Abonema and Choba communities decreased progressively from 2008 to 2010 unlike in Aluu and Emohua communities where the catches in 2009 exceeded those of 2008. The catches recorded in 2010 were the lowest in the four communities studied (Fig 2). Emohua community recorded the highest numbers of catches (31%) from 2008 to 2010 (Table 2).

The mean annual number of crocodile catches per person was highest in Choba in both 2008 (26) and 2010 (20). However, in 2009, the

catches per person were highest in Aluu community. Each fisherman/hunter respondent in Aluu caught 29 crocodile.

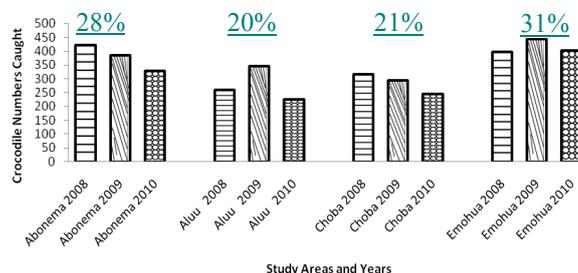


Figure2: Number of crocodiles hunted in each community from 2008 - 2010 by respondents (Percentage values given above)

Table 2: Mean monthly catches of crocodiles and average number of Crocodile caught by fisherman/hunters (Annual basis)

Year	Abonema	Aluu	Choba	Emohua
2008	35(18)	22(22)	26(26)	33(17)
2009	32(17)	29(29)	25(25)	37(19)
2010	27(14)	19(19)	20(20)	33(17)

Vulnerable Size (Stage) of Crocodile for Hunting

Catching of crocodile in the study areas were not deliberate but mostly by chance. With the exception of Aluu where seasonal variation of catches is 50% for both dry and rainy season, the season for abundant catches in other communities was dry season (Table 5).

Table 3: Variation of crocodile catches according to season and catching strategy in study area

Study area	Variation	Frequency	Percentage (%)
Abonema			
Season	Rainy season	14	17.3
	Dry season	19	82.3
Catching strategy	Purposely set trap	8	22.0
	By chance	15	78.0
Aluu			
Season	Rainy season	6	50.0
	Dry season	6	50.0
Catching strategy	Purposely set trap	2	17.0
	By chance	10	83.0
Choba			
Season	Rainy season	0	0
	Dry season	12	100
Catching strategy	Purposely set trap	2	17.0
	By chance	10	83.0
Emohua			
Season	Rainy season	2	9.0
	Dry season	21	91.0
Catching strategy	Purposely set trap	15	65.0
	By chance	8	35.0
Cumulative			
Season	Rainy season	12	17.0
	Dry season	58	83.0
Catching strategy	Purposely set trap	27	39.0
	By chance	43	61.0

DISCUSSION

A total of 3,206 crocodiles were caught in the study area between 2008 and 2010. The removal of 3,206 individuals of crocodile from a water body in a space of three years without any plan for replacement is a form of unsustainable utilization. The progressive decrease in the number of catches between 2008 and 2010 in Abonema and Choba can be attributed to the fact that the population of crocodile in the areas have decreased due to decimation pressure and habitat destruction. Bolton (1997) obtained a similar result that crocodile population crashed under the pressure of hunting largely because the process of hunting was removing the least expendable segment of the population. The numbers of catches in Aluu and Emohua communities were relatively highest in 2009 due to increased effort by the fishermen to catch more individuals as a result of poverty.

The total number of crocodiles caught between 2008 and 2010 was higher in Emohua and Abonema than Choba and Aluu communities (Fig 2). Not fewer than 33 and 27 individuals of crocodile were killed on monthly basis in Emohua and Abonema respectively (Table 2). This could be attributed to the fact that Abonema and Emohua have more fishermen/hunters than Aluu and Choba communities (Table 1). It can also be related to the relatively larger water body in Abonema area which provides large surface area for fishermen/hunters to operate. The fact that the fishermen/hunters in Emohua community make sales outside their community and the resultant high demand pressure from buyers can stimulate them to increase their hunting effort because of the ready market.

The average numbers of crocodile caught by fishermen/hunters on annual basis were higher in Choba and Aluu compared to Abonema and Emohua between 2008 and 2010 (Table 2). This could be as a result of the relatively large operational area of each fishermen/hunters in Choba and Aluu as there are only 12 fishermen/hunters in each of the communities. The implication of this high hunting rate of crocodile is that as efforts are increased in each community there will be commensurate reduction in numbers of crocodiles in the wild. Crocodiles were mainly caught in the dry season

which is when water tide or level is low. During this period most communities in riverrine areas in Rivers State always have them entangled in their fishing nets or baskets. Catches during rainy season is always low because of high water level similar to what is obtainable is fishing. Respondents who reported that most of their catches were during rainy season may have made those catches towards the transition period between rainy and dry season.

The crocodile sizes mostly caught by fishermen/hunters in the study area were the juvenile size. This could be attributed to the fact that it is less dangerous compared to other sizes and can also be related to the implements used in catching them. The juveniles were mostly caught with fishing nets or baskets. Majority of them got entrapped in fishing nets as juveniles stray away to feed. This agrees with the work of Hutton (1989) which elaborated on the variation in habitat utilization between juveniles, sub-adults and adults and reported that the juveniles enter a dispersal phase at approximately 1.2 m length and has a dual habitat as aquatic and terrestrial (Hutton 1989; Fergusson 2010). The fishermen/hunters that purposely set traps to catch the adults always have few catches when compared with the catches of juveniles made. However, catches of juveniles by fishermen is not deliberate but always by chance (Table 3). This partially agrees with Aust (2009) on Nile crocodile.

The most vulnerable stage of the crocodile in the study area was the juvenile stage because out of the 70 fishermen/hunters sampled in the study area 38 being 54.3% caught the juvenile mostly, followed by sub adults and adults. The high depletion of juveniles will seriously affect the population of sub adults and adults because it is only the few juveniles that are not caught will develop to sub-adults and adults and if development to adult stage is hampered breeding will also be affected because the breeding stock will one day be killed, die naturally or become too old to breed. Some of the fishermen/hunters who caught these juveniles have been eating and selling them hence efforts are not made to stop the entanglement of the juveniles in fishing nets. This kind of high juvenile decimation confirmed the work of Jones (1991) that Nile crocodile is an endangered species that is at the verge of extinction in West Africa.

The adults are not normally caught with fishing nets because they can tear the nets. Instead they are caught with traps and catching of the adults are not common as they are mostly caught by hunters and not fishermen.

CONCLUSION

Nile crocodiles are consistently hunted in the study area. The lachrymal hunting of Nile crocodile makes it difficult for replacement at the same rate of decimation and is seriously reducing their population. All age classes of crocodile in the study area is vulnerable to hunting. However, juveniles are the most vulnerable age class. The probability of a juvenile growing to adult size is very low because of the high mortality rate of the juveniles. This will likely lead to a progressive increase in the death of juveniles and sub adults as the replacement of an adult crocodile in the wild is bound to take several years and usually involve the production and loss of large number of hatchlings. Even though killing of the species at juvenile stage has not been intentional but efforts were not made to restrict the fishermen from killing the crocodiles at such ecologically lachrymal stage. Consistent creation of awareness against killing of crocodiles at juvenile and sub adult stages, and the use of local legislation can effectively reduce the high rate of crocodile killing at the immature stages. Professional hunters know the locations to set their traps to catch only adults and by that means, tactically avoid killing the juveniles. Since the juveniles were only killed by fishermen through entanglement in fishing nets it implies that their killing can be avoided by setting nets where juveniles cannot stray to. Killing of juveniles is wasteful because it has a lower economic value than the adults even though it is always consumed by the fishing household. The utilization of natural resources such as the Nile crocodile for various purposes by man is not abysmal but when immense pressure is consistently mounted on resources they continue to decrease in number and may eventually become locally extinct.

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