



Species List, Age and Sex Composition of Wild Animals Harvest in Bagale Hill of Girei Local Government Area of Adamawa State, Nigeria

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Abstract

The study was undertaken to assess the check-list, age and sex composition of wild animals harvest in Bagale Hills of Girei Local Government Area of Adamawa State, Nigeria. Three locations (Girei 1, Jabbi-lamba and Labondo) were identified for the study. Rural appraisal techniques, literatures, visit to bush meat selling and processing centers as well as structured questionnaires were used to obtain data of the stated objectives. Simple descriptive statistics (frequency tables and and student t-test) were used in the analysis of data. Results obtained showed that majority of the respondents were males (66.67%) within the ages of 31 and above 50 years (23.08%), bush meat vendors (26.87%) and are indigenes (31.94%) of the area. The result indicated that most of the respondents preferred bush meat (61.43%) especially large mammals (66.67%) as source of protein in the study area. The result of check-list of wild animal species showed that 18 species of mammals, 6 species of reptiles and 9 species of birds were identified in the area. Results of age and sex composition of wild animal harvest showed that the number of adults harvested is significantly higher ($P < 0.05$) than the sub-adults and juveniles; while the number of females killed is significantly higher ($P < 0.05$) than that of males. To avoid the future extinction of the existing wild animal species, strict supervision of their harvest should be recommended by the authority concerned.

Key Words: hunting, check-list, adults, juveniles, male, female.

Introduction

Bush-meat is an important source of animal protein in both rural and urban households throughout Africa. Thousands of wild animal species obtained from the forest in the tropical ecosystems are sources of livelihood to human societies. This is because protein source accounts for an important aspect of balanced diet in human nutrition (Kalu & Aiyeloja 2002). Wildlife is hunted for food, trophies (most often skins, teeth, antlers and horns), medicines and other traditional uses (most hard and soft body parts), and as pets (especially primates, birds and reptiles). Therefore individuals hunt tropical forest wildlife primarily to eat and/or sell it (Nasi, et al., 2011). Hunting and gathering of wild animals has always been and continues to be an important aspect of life in rural African societies. In Africa, humans have eaten

wildlife since before our lineage separated from other apes, over 6 million years ago (Stanford and Bunn, 2001). Nowadays, wildlife is still hunted as a source of meat (bush-meat), income, to control agricultural crop pests, reduce threats to livestock and human safety, and as trophies (Bennett *et al.*, 2007).

Savannah grasslands have extensive and often nutritious grass cover which supports extensive populations of large herbivores. Carnivores such as lions, cheetahs, and jackals in Africa, historically preyed upon huge herds of grazers. Large running birds, such as the African ostrich, inhabit savanna environments, as do the abundance of smaller animal species (Bobbo *et al.*, 2015). The wild animals most commonly associated with savannas are herbivores, browsers of grass, palatable shrubs, and tree

leaves, and the carnivores that prey on them. In the past century or two, many of the world's native savanna species, especially the large carnivores, have disappeared with the expansion of human settlement. This is due to the unchecked anthropogenic activities in the savannah against wildlife (Babajide and Taiye, 2017). No serious concern have been given to whether the species hunted for are adult, juveniles, pregnant, nursing mothers, or endangered. Indiscriminate harvesting has always been the case in most of the rural areas (Kwaga *et al.*, 2006).

Data on bush meat consumption however, were mostly based on estimates of the number of people who eat bush meat or on estimates of bush meat contribution to national protein supply. Some of the earlier studies in certain part of West Africa gave annual wild animal consumption figures ranging from 20% of the animal protein among rural people living in Nigeria's rain forest areas as compared with 13% in the whole country, to 75 % in rural Ghana compared to 9.2% nationally, 70-80 % in Cameroon's forest zone compared with 2.8 % for the entire country and as much as 80-90 % in Liberia (Bennett *et al.*, 2007).

A considerable amount of work was done in the early 1980s to document bush meat consumption particularly in West Africa. Virtually all species of wild animals are acceptable as a food resource to some group of people in Africa. Species which may be tabooed by one group of people are a delicacy to another group elsewhere. Species eaten vary from antelopes to monkeys, rodents, reptiles and a whole range of invertebrate species including snails, termites and beetles (Bennett *et al.*, 2007, Kwaga *et al.*, 2006).

Bush meat, in particular, offers a number of benefits to forest-dwelling populations. It is an easily traded resource as it is transportable, has a high value/weight ratio and is easily preserved at low cost (Swamy

and Pinedo-vasquez, 2014). Throughout tropical forest countries, many people benefit from wild meat: from those who eat it as part of a forest dependent subsistence life-style, to those who trade and transport it at all points along different supply chains, to those who consume it in restaurants and homes, often far from the forest. However for rural people, without access to capital, land or livestock, the harvest of wildlife resources may offer the best return for labour input (Nasi *et al.*, 2008). The trade in bush-meat for local, national or regional trade now forms an important part of the informal sector's "hidden economy" and although access to markets is a key factor in realizing economic values of wild products, the determination of people to access markets if there is sufficient economic incentive to do so should not be underestimated (Dutton *et al.*, 2013). The activity of hunting and bush-meat trade, although largely ignored in official trade and national statistics, played a crucial role in the economies of numerous tropical forested countries, but they are usually not tapped as a source of government revenues (Nasi *et al.*, 2008).

Bush meat represents an important protein source in the tropics while gathered plant foods are important dietary supplements to the starchy staple diet. In at least 62 countries world-wide, wildlife and fish constitute a minimum of 20% of the animal protein in rural diets. What is known of the nutritional composition of bush-meat species suggests that these provide an equivalent or even greater quality of food than domestic meats with less fat and more protein (Nasi *et al.*, 2011).

The time frame since the last documented work on bush meat consumption as well as their check list in West Africa is a lengthy one. Such data is particularly lacking in the Girei Local Government Area of Adamawa State, Nigeria. With the alarming rate of illegal anthropogenic activities on the reserve and the mindless harvest of animals without regards to their composition and

population, constitutes a major challenge to conservation efforts in any State of the nation, this has not been addressed in the study area. The most preferred species of interest might be exhausted which could probably give room for the protection or sustainable utilization of the species (Kwaga, *et al.*, 2006), consequently leading to the extinction of the species in its habitat. Such also has not been documented in the study area, hence the need for this study which is to assess the species list and composition of wildlife harvest in Bagale Hills of Girei Local Government of Adamawa State, Nigeria.

Materials and Methods

Location of the Study Area

The study area is Girei Local Government Area of Adamawa State. It lies on latitudes 9°09'N to 9°33' and Longitudes 12°21'E to 12°33' E. The area is bounded to the north and south by Song and Fufore LGAs, to the west by Yola North LGA (Njobdi, 2015). The mean annual rainfall ranges from 700mm to 1000mm and the temperature in this climatic region is high throughout the year because of high radiation which is relatively evenly distributed throughout the year.

$$n_h = N_h \times \frac{n}{N}$$

Where: n_h = number of questionnaire administered in each community, N_h = estimated population of the people in each community, n = total number of questionnaires administered, N = total number of people in all the communities (Dishan *et al.* 2009).

The study area was stratified into 3 locations (Labondo, Jabbi-lamba and Girei) based on their market days. To obtain information on the demographic characteristics of the respondents and species list of wild animals in the study area, structured questionnaires were administered. For the information on the species composition of wildlife harvest in the study area, the indirect method described by Boakye *et al.*, (2016) (hunter bags) of surveying wild animals and

Maximum temperature of about 40°C is observed while minimum temperature can be as low as 18°C between December and January, mean annual temperature ranges between 26.9°C and 27.8°C. The area has a relative humidity of 20-80%. The area is characterized by two distinct seasons, dry season (November to April) and rain season (May to October) (Adebayo and Tukur, 1999). Dominant plant species include *Detarium microcarpum*, *Khaya senegalensis*, *Terminalia mantaly*, while some of the fauna resources are duikers monitor lizard, hares, squirrels porcupine and several species of birds (Njobdi, 2015)

Study Design and Data Collection

Data was collected over a time frame of three months (December, 2019 to February, 2020). A total of 100 questionnaires were administered in the study locations and at the State Divisional Offices of Ministry of Environment, out of which 65 were retrieved. The respondents were the hunters, bush-meat vendors, bush-meat consumers and State Divisional Office staff. Cochran method adopted by Dishan *et al.* (2009) was used in the questionnaire distribution across the study sites. This is illustrated as follows:

Richard (1992) were adopted. Hunters, bush-meat vendors, and consumers were interviewed as well as visit to bush meat selling and processing centers in the study area following Boakye *et al.*, (2016).

The most preferred species harvested in the study area were assessed by studying hunter bags composition, bush-meat processing and selling centers around the study area. This involved interviews and administration of structured questionnaires

to hunters and bush-meat vendors and consumers.

Statistical Analysis of Data.

Data on the socio-economic characteristics of the respondents were subjected to descriptive statistics (frequency tables and percentages), while data on composition of wildlife harvest was analyzed using descriptive statistics (percentages and Student t-test) was used in determining age and sex composition of wildlife harvest in the study area following Oluokon and Adeyemo (2018). Checklist of wildlife species harvested in the study area was compiled using literature and the local dialects. The names were compared through photo-analysis with the *Kingdom Field Guide to African Mammals* as adopted by Barber-Meyer (2010) and Kwaga *et al.* (2006).

Results and Discussion

Demographic Characteristics of Respondents

The result of gender and age distribution of the respondents is shown in Table 1. A total of 66 respondents were recorded mostly males (66.67%) with few females (33.33%). As regarding the age of the respondents, those within the age brackets of 31-40 and above 50 formed the majority (23.08%). The result also provided information on the occupation of the respondents across the study area.. Most of the respondents are civil servant (23.88% as against farmers (14.93%). Education qualification of respondents in the study area showed that those that attained secondary and tertiary levels were highest (39.06%) in number. In the case of residents of the area, the indigenes (31.94%) formed majority followed by farmers and civil servants (25.00%) in the study area. The finding of this study indicates that males are mostly the determining factors of wild animal destruction. This could probably be the reason why many of men are hunters in the

study area. Babajide and Taiye (2017) reported that a lot of anthropogenic activities are rampant in the savannah regions of Nigeria.

Preferred source of meat and availability in the study area

The result of preferred source of protein/meat by the respondents is presented in Table 2. The results indicated that bush meat is preferred (61.43%) to domestic meat (21.43%) and fish (17.14%). Table 3 shows the result of the availability of wildlife species at the market in the study area. The result indicated large mammals (66.67%) having the highest as against bird species (5.56%). The finding of this study is in agreement with Oluokun and Adeyemo (2018) who observed that a notable portion of the world's population depends solely on some biological resources, especially wildlife resources for in the developing countries.

Check-list of wildlife species in the study area

The result of check-list of mammal species in the study area is presented in Table 4. A total of 18 species were recorded. All the species are distributed across the sites except for *Felis serval* (serval cat) and *Genetta genetta* (Forest genet) which occur in only one site (Jabbi-lamba). This findings far lower that of Kwaga *et al.* (2006) and Happold (1987) who identified 27 and 123 species of mammals in northern guinea savannah of Adamawa and southern guinea savannah zones of Nigeria respectively The result of the check-list of reptile species is shown in Table 5. It indicated a total of 6 individuals. While *Varanus niloticus* (monitor lizard) and *Python sabae* (python) are found across the entire study area, *Naja nigricolis* (spotted cobra) and *Bitis arietans* (puff adder) are confined to only one site. This finding is in contrast to that of Kwaga *et al.* (2006) who identified only 2 species in northern guinea savannah of Adamawa State. It is also in contrast with the finding of

Aiyelaja and Ejeomah (2011) who reported over 3000 species of lizard alone worldwide Table 6 shows the result of check-list of bird species in the area. A total of 9 individuals were recorded with *Streptopelia senegalensis* (turtle laughing dove) and *Numida meleagris* (guinea fowl) appearing in all the sites. The finding on bird species by this study is also far below that of Kwaga et al. (2006) who recorded 25 species of birds in northern guinea savannah of Adamawa State.

Age and Sex composition of wildlife harvest in the study area.

The result of age-sex composition of wildlife harvest in the study area is presented in Table 7. It indicated that adult formed the major (58.14%) of the harvests followed by sub-adults (27.91%) and juveniles (13.95%). For the sex composition of wild animals harvested, female species were harvested more (58.14%) than the males (41.86%) in the study area. The finding on age and sex composition of wild animals harvest in the study area indicates that the number of adults killed were significantly higher than the sub-adults and juveniles, while the number of females killed were higher than males. Higher number of adults killed agrees with the regulation of harvest while high number of females violates the regulation (Kwaga et al., 2006). The high rate of killing, especially the female species in the study area is most likely to result in decline of wild animal population in the study area.

Conclusion

The study determined the species list, age and sex composition of wild animal harvest in Girei Local Government Area in Adamawa State. Questionnaires were distributed across three selected sites to source information from the respondents. From the findings of this study, male were highly involved in wild animal killing for bush meat because of the available mammal species in the area. It can be concluded that

the study provided base-line information on species as well as sex and age composition of wild animals harvest in Bagale Hills of Girei Local government Area of Adamawa State, Nigeria.

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Table 1: Demographic characteristics of Respondents in the study Area.

Gender	Girei 1	Jabbi-lamba	Labondo	Total	Percentage
Male	18	8	18	44	66.67
Female	7	8	7	22	33.33
Total	25	16	25	66	100
Percentage	37.88	24.24	37.88		
Age Distribution					
15-25	3	7	2	12	18.46
26-30	4	3	4	11	16.92
31-40	5	9	1	15	23.08
41-50	7	2	3	12	18.46
Above 50	6	4	5	15	23.08
Total	25	25	15	65	100
Percentage	38.46	38.46	23.08		
Occupation					
Civil servant	6	8	2	16	23.88
Farmers	5	4	1	10	14.93
Hunters	6	6	2	14	20.90
Table 1 continued:					
Bush meat vendors	7	5	6	18	26.87
Others	4	2	5	11	16.41
Total	26	25	16	67	99.99
Percentage	38.81	37.31	23.88		
Educational Status of Respondents					
Primary	4	3	1	8	12.50
Secondary	11	8	6	25	39.06
Tertiary	6	12	7	25	39.06
Others	4	2	--	6	9.38
Total	25	25	14	64	100
Percentage	39.06	39.06	21.88		
Reason for residing/living around the study site					
Place of Origin	8	8	7	23	31.94
Internally Displaced Person (IDP)					
Farming	--	4	3	7	9.72
Employment	8	6	4	18	25.0
Others	12	5	1	18	25.0
Others	1	2	1	4	5.56
Total	29	27	16	72	97.22
Percentage	40.28	37.50	22.22		

Table 2: Preferred Source of Protein in the study area.

	Girei	Jabbi-lamba	Labondo	Total	Percenta
Bush meat	19	17	7	43	61.43
Domestic meat	6	5	4	15	21.43
Fish	3	3	6	12	17.14
Total	28	25	17	70	100
Percentage	40.00	35.71	24.29		

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Table 3: Availability of Wild animal species at the market place in the study area.

	Girei	Jabbi-lamba	Labondo	Total	Percentage
Large mammals	20	13	3	36	66.67
Rodents	2	5	1	8	14.81
Reptiles	1	3	3	7	12.96
Birds	--	3	--	3	5.56
Total	23	24	7	54	100
Percentage	42.59	44.44	12.96		

Table 4: Checklist of Mammals species in the Study area

S/n Common Name	Scientific Name	Girei II	Jabbi-lamba	Labondo
1.Porcupine	<i>Hystrix cristata</i>	X	X	X
2.Olive Baboon	<i>Papio Anubis</i>	X	X	X
3.Red patas monkey	<i>Cercopithecus patas</i>	X	X	X
4. Tantalus monkey	<i>Cercopithecus tantalus</i>	X	-	X
5.Side-stripped Jackal	<i>Lutra maculicollis</i>	X	X	X
6.Rock hyrax	<i>Procavia johnstoni</i>	X	X	X
7.Fox	<i>Vulpes pallid</i>	X	X	X
8.African civet	<i>Civettictis civetta</i>	X	X	X
9.Grass cutter	<i>Thryonomis swinderianus</i>	X	X	X
10Caracal	<i>Felis caracal</i>	-	X	X
11.Honey badger	<i>Mellivora capensis</i>	X	X	X
12.Wild cat	<i>Felis sylvestris</i>	X	X	X
13.Squirrel	<i>Euxerus erythropus</i>	X	X	X
14.Giant Rat	<i>Cricetomys gambianus</i>	X	X	X
15.African hedgehog	<i>Atelerix albiventris</i>	X	X	X
16.Hare	<i>Lepus saxatilis</i>	X	X	X
17.Serval cat	<i>Felis serval</i>	-	-	X
18.Genet	<i>Genetta genetta</i>	-	-	X

Keys: X = Present, -- = Absent

Table 5: Checklist of Reptiles in the study area.

S/n Common Name	Scientific Name	Girei II	Jabbi-lamba	Labondo
1.Nile Monitor lizard	<i>Varanus niloticus</i>	X	X	X
2.Savannah Monitor Lizard	<i>Varanus exanthematitus</i>	X	X	X
3.Rock python	<i>Python sabae</i>	X	X	X
4.Royal python	<i>Python regius</i>	-	-	X
5.Spitting cobra	<i>Naja nigricolis</i>	-	X	-
6.Puff adder	<i>Bitis arietans</i>	-	X	-

Table 6: Checklist of Bird species in the study area.

S/nCommon Name	Scientific Name	Girei II	Jabbi-lamba	Labondo
1.Abdims Stork	<i>Ciconia abdimii</i>	-	X	-
2.Grey Heron	<i>Ardea cinerea</i>	-	X	-
3.Guinea fowl	<i>Numidia meleagris</i>	X	X	X
4.Francolin	<i>Francolinus coqui</i>	X	X	X
5.Spur-winged Geese	<i>Plectropterus gambensis</i>	X	X	X
6.Goshawk	<i>Melierax canorus</i>	-	X	-
7.Turtle/Laughing Dove	<i>Streptopelia senegalensis</i>	X	X	X
8.Owl	<i>Tyto alba</i>	X	X	-
9.Cattle Egret	<i>Bubulus ibis</i>	X	X	-

Table 7: Age and sex composition of wildlife harvest in the study area

Age composition	Girei	Jabbi-lamba	Labondo	Total	Mean	Percentage
Adults	15	6	4	25	8.33 ^a	58.14
Sub-adults	6	4	2	12	4.00 ^b	27.91
Juveniles	3	2	1	6	2.00 ^c	13.95
Total	24	12	7	43		100
Percentage	55.81	27.91	16.28			
Sex composition						
Male	9	6	3	18	6.00 ^b	41.86
Female	15	6	4	25	8.33 ^a	58.14
Total	24	12	7	43		100
Percentage	32.56	27.91	16.27			

Means with different superscripts differ significantly (P<0.05)