



## ASSESSMENT OF HUNTERS' HARVESTED ANIMALS IN TWO BUSH MEAT MARKETS

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### ABSTRACT

In many localities, bush meat trades remains unmanageable and state of the wild where animals are being hunted can be inferred from frequency of returned animals by hunters to bush meat markets. Information on the state of the wild where animals are been hunted were investigated by collecting information on the population of harvested biomass the hunters returned to two Bush meat markets. On the site market survey was employed for collection of information on harvested animals for twelve weeks. Each animal was properly observed, categorized into age group, sex class and identified to species level. Collected data were subjected to descriptive and Chi-square statistics. A total of 137 harvested animals from eight species were encountered in the two markets and Grasscutter were mostly found in the markets (58). Highest number of harvested biomass were encountered at Omi-Adio Bush meat market (63%). Majority of the animals were of females and adults groups. Significant association was found between the Bush meat markets and the harvested animal species hunters returned there.

**Keywords:** Bush meat, sex, age group, hunters, market

### INTRODUCTION

The meat that are frequently obtained from the illegal harvested biomass of wild animals such as reptiles, mammals, birds and amphibians for either the purpose of subsistence or trade is known as Bush meat (Bennett *et al.*, 2007). Bush meat provides significant basis of income among many poor in the rural. Preference for Bush meat consumption is driven by many factors like culture, poverty, taste preference to other types of meat, social status. In many sub-Sahara of Africa where dependence on Bush meat is for subsistence, hunters harvest biomass to provide meat essentially to meet the protein requirement of their families and as a source of income (Geist, 1988). Variability in the consumption drive is largely associated with cultural predilection, availability of Bush meat, affordable income and price (Brashares *et al.*, 2011). Among rural people who could not afford alternative domestic source of protein and urban dwellers who eat Bush meat for delicacies, Bush meat serves as source of protein (van Vliet and Mbazza, 2011; Schenck *et al.*, 2006). In comparison to plant food nutrient, Bush meat micronutrient is available in much quantity (Golden *et al.*, 2011).

With family economy reliance on Bush meat and the trade in many rural areas, it poses increase threat on the biodiversity. In forested areas of West and Central Africa, Bush meat trade is a foremost threat to biodiversity of wild animals (Fa *et al.*, 2003). It has been observed that increase in threat from unlawful harvesting of wild biomass occurs during times of political stability and instability in certain African countries. Contrary to increase in biodiversity threat as a result of political instability, threat from Bush meat trades transpires in times of political stability as well (Okello and Kiringe, 2004). Although civil unrest and war caused surge increase in Bush meat trades in countries such as Mozambique, Central African Republic (Lindsey *et al.*, 2011). Without abasing the drivers for Bush meat there will be continuous threat to the resource and there will be escalation of effects of illicit hunting in future (Wilkie *et al.*, 2011).

Hunting as practice related to Bush meat trade is not sustainable as it amount to prevalent reduction in wild animals' population (Fa *et al.*, 2000). Impacts of illegal hunting is obvious on both protected and unprotected lands. Illicit hunting is been pushed towards protected areas because

wildlife resource is vast vanishing from unprotected lands as a result of wide range threats. Prevalent of illegal hunting activities have been recorded close human settlement and near to the borders of protected areas (Hofer *et al.*, 2000). Hunting efforts of hunters have been reported to be mostly around features like rivers and water holes where much numbers of wildlife usually occurs (Wato *et al.*, 2006; Lindsey *et al.*, 2011). Rodents and ungulates have been reported as mostly hunted wild animals in Central and West of Africa (Fa, Ryan and Bell, 2005). Illegal hunting is major causative factor to decline in wildlife population (Scholte, 2011). Many studies have reported declines in abundance of wildlife in many of the African countries (Okello and Kiringe, 2004; Craigie *et al.*, 2010 and Wilkie *et al.*, 2011). Instance of debilitating effect of illegal hunting due to decline in seed dispersing mammals and large herbivores had been reported to have effect on the species and structure composition of forest and savana habitats (Brodie *et al.*, 2009). Effect of Bush meat trade is not only about wild animal resource depletion, it extends to human in terms of health risk. Health hazard involved in Bush meat consumption has been majorly downplayed among the consumers. Scientific report observed that consumers of Bush meat most times are not familiar or deterred by infectious disease like zoonotic (Subramanian, 2012) Likewise, increase in Bush meat price does not deter access to it by many who can afford it and those that cannot purchased it but can capture it (Kümpel, 2007). Information on the health and state of the wild where animals are been hunted required verification through new study that can compare with previous research works. Hence this research scope was mainly on assessing the population of harvested biomass the hunters returned to the markets and the existing association between the markets and the harvested animals.

### Study Locations

This study was carried out at two Bush meat markets; Omi Adio Bush meat market and Top Brewery Bush meat market also known as Olomore Bush meat market. Both are located in two different states and were chosen based on the popularity of the markets within the cities. Top Brewery Bush meat market is located in Abeokuta North Local Government Area of Ogun State while Omi-Adio Bush meat market is

found at the Ido Local Government area of Oyo State (Figure 1). Oyo state covers a total of 28,454 km<sup>2</sup>, bounded by three different states; Ogun, Kwara and Osun state. It lies on coordinates 8.1196° N and 3.4196° E. The vegetation pattern of Oyo State is that of rain forest in the south and guinea savannah in the north and the landscape comprise of domed shaped hill and old hard rock of 500 meters above sea level in the south and about 1,219 metres above sea level in the north

(oyostate.gov.ng). Ogun State is located in the Southwest Zone of Nigeria with a total land area of 16,409.26 square kilometres. It is bounded on the West by the Benin Republic, on the South by Lagos State and the Atlantic Ocean, on the East by Ondo State, and on the North by Oyo and Osun States. It is situated between Latitude 6.2°N and 7.8°N and Longitude 3.0°E and 5.0°E (archive.ogunstate.gov.ng).

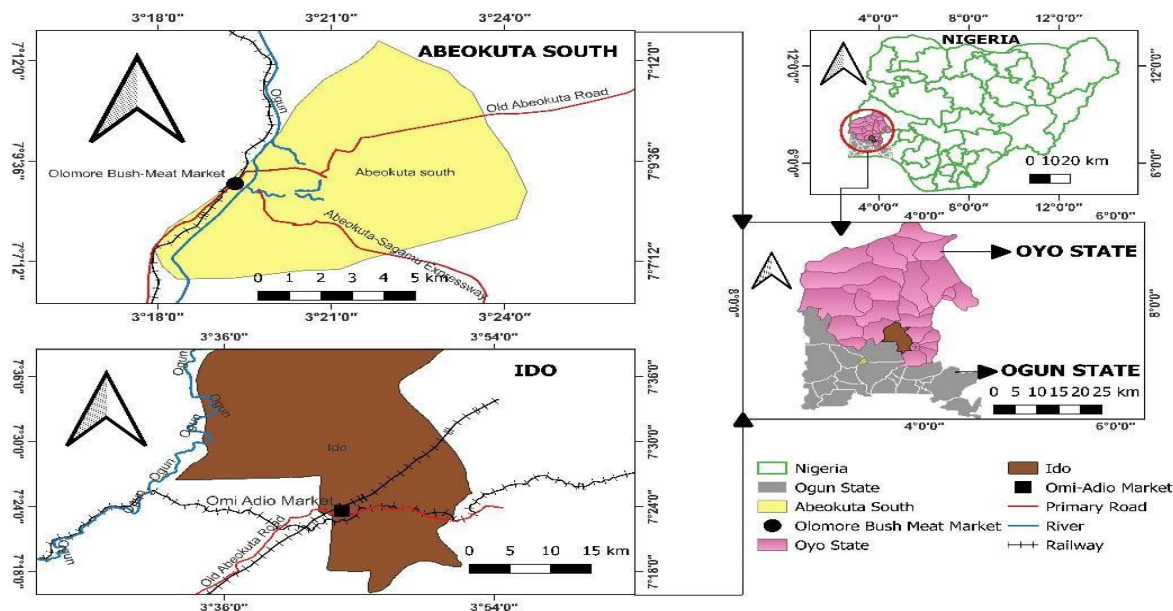


Figure: 1 Study locations showing Omi-Adio and Top Brewery Olomore Bush meat Markets

## MATERIALS AND METHOD

Information on harvested animals returned to the markets by hunters were recorded for twelve weeks between 7am to 3pm weekly for twelve weeks from April to June. To lend credence to this baseline study, at each bush meat market the market leader and the head of sections of the bush meat traders were approached to discuss our purpose in the market. It was after this that the markets leaders permitted our team and granted the data collection exercise. On the site market survey was employed for collection of information on harvested animals. Each arrival was properly observed for identification before been prepared and dressed by Bush meat vendors. With the consent and efforts of the Bush meat traders, each animal was clearly identified to species level with their local names while English and scientific name of each animal was determined using animal guide. Indicators of animal population structure was accounted for by classifying the animals into sex group of male and female as well as age group of adults, sub-adult and juvenile. Collected data were subjected to descriptive statistics and inferential statistics. Chi-Square  $X^2$  was used to determine association between the animals' species and the markets.

## RESULTS AND DISCUSSION

Total abundance of harvested animals brought to the two markets was One hundred and thirty-seven (137) from eight (8) different species. Most abundance of hunted animals were found at Omi-Adio Bush meat market. Grasscutter (59%) was the most abundant of all the animal species followed by Duiker (26%). This was in agreement with Fa, Ryan and Bell (2005) study reports that rodents and ungulates were mostly hunted wild animals. The prominent of the rodent was in agreement with discovery of Okorie and Ekechukwu (2004)

yet contrary to the findings of Halidu (2019) who reported dominance frequency of Duiker for Bush meat. Civet cat (1%), Tree hyrax (1%) and Mongoose (1%) were least abundant harvested animals to the markets.

Generally, abundance of hunted animals based on sexes showed that more females (52%) animals were brought to the markets than males (48%). Similarly, in each of the market more females were recorded than the males. Forty-four (44) female animals were recorded in Omi Adio Bush meat center compared to Twenty-seven (27) males encountered at the Olomore Bush meat market.

In the age group class, adult (98%) animals were more harvested than the juvenile (2%) animals. Likewise, more adult animals were supplied to each market than juvenile. 85 adult animals were recorded at Omi Adio Bush meat market and while 49 adults were documented at the Olomore Bush meat center (Table 1). The low frequency of harvested animals returned by the hunters was contrary to the consistent records of high frequency pattern during dry season Holmern *et al.*, (2007). Total population of harvested animals returned to the two markets indicated decrease in hunters' harvest compared to the findings of (Yisau, *et al.*, 2019). This implies a negative implication of conservation of the wild animals around the markets environment. More so, there was also decline in the number of species of animals brought to the two markets when compared to the previous study. It further reveals the unhealthy state of the wild animal habitats around the two Bush meat markets where the animals were being hunted. Possible factors that may be responsible for this noticeable decline could be Urban sprawl and indiscriminate hunting activities which have remain largely unchecked. Likewise, it could be as a result of loss of wildlife habitats to agriculture and deforestation. This impacts and threats were

predicted by Wilkie *et al.*, (2011) that wildlife resources are in danger of future threat.

There was no significant association between the species of animals supplied by the hunters and the animals' sex  $X^2 (7, N=137) = 9.95, P = 0.192$ . This was obvious in the marginally numerical proportion of the harvested animals age group hunters brought to the markets. Significant association was found between the species of harvested animals by hunters and the animals' age group in the Bush meat markets  $X^2 (14, N=137) = 149.609, P = 0.000$ . This was evident in the proportion of adult animals majorly supplied to the markets.

Though the young animals were not prominent in the hunters' harvest yet influx of harvested animals to the markets was on a decline note to prior study. Likewise, there was significant association between the species of animal hunters supplied and the Bush meat markets  $X^2 (14, N=137) = 57.452, P = 0.001$  (Table 2). This study concluded that there was decline in the population of animal hunters were harvesting in the wild by comparison with previous studies. It is a revelation of continuous loss of biodiversity and it requires attention of conservation agencies.

**Table 1: Hunters' harvested biomass species, abundance, sexes and age group**

Animal Species	Sex			Age Group		
Common Name	Female (%)	Male (%)	Total (%)	Adults (%)	Juvenile (%)	Total (%)
Grasscutter (Oya)	50 (62)	31 (38)	81 (59)	81 (100)	0 (0)	81 (59)
<i>Thryonomys swinderianus</i>						
Duiker (Etu)	13 (37)	22 (63)	35 (26)	35 (100)	0 (0)	35 (26)
<i>Cephalophus maxwelli</i>						
Civet Cat (Aketa)	0 (0)	1 (100)	1 (1)	0 (0)	1 (100)	1 (1)
<i>Genet tapardina</i>						
Monitor Lizard (Alegba)	2 (50)	2 (50)	4 (3)	2 (50)	2 (50)	4 (3)
<i>Veranus niloticus</i>						
Squirrel (Ikun)	2 (40)	3 (60)	5 (4)	5 (100)	0 (0)	5 (4)
<i>Xerus erythropus</i>						
Mongoose (Ijakumo)	0 (0)	2 (100)	2 (1)	2 (100)	0 (0)	2 (1)
<i>Crossarchas obscurus</i>						
Bushbuck (Igala)	3 (43)	4 (57)	7 (5)	7 (100)	0 (0)	7 (5)
<i>Tragelaphus scriptus</i>						
Tree Hyrax (Ofafa)	1 (50)	1 (50)	2 (1)	2 (100)	0 (0)	2 (1)
<i>Dendrohyrax dorsalis</i>						
	71 (52)	66 (48)	137 (100)	134 (98)	3 (2)	137 (100)
<b>Markets</b>	<b>Sex</b>			<b>Age group</b>		
	<b>Female (%)</b>	<b>Male (%)</b>	<b>Total (%)</b>	<b>Adults</b>	<b>Juvenile</b>	<b>Total</b>
Olomore	27 (53)	24 (47)	51 (37)	49 (96)	2 (4)	51 (37)
Omi Adio	44 (51)	42 (49)	86 (63)	85 (99)	1 (1)	86 (63)
<b>Total</b>	<b>71 (52)</b>	<b>66 (48)</b>	<b>137 (100)</b>	<b>134 (98)</b>	<b>3 (2)</b>	<b>137 (100)</b>

\* Values in parenthesis are percentages and local names

**Table 2: Association between harvested animals' sex, age group, Bush meat markets and the animal species**

Variables	Values	Df	Number of cases	Sig
Animal sex * Animal species	9.95	7	137	0.192ns
Animal age group * Animal species	149.609	14	137	0.000**
Bush meat markets * Animal species	57.452	14	137	0.001**

\*\*P-value  $\leq 0.01$

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