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ANALYSIS OF BUSHMEAT COLLECTION AND TRADE IN EPE, IKORODU AND OYINGBO (LAGOS STATE)

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ABSTRACT

Bushmeat hunting and trade in Epe, Ikorodu and Oyingbo in Lagos State were investigated. Data were obtained by interview method using questionnaire administered separately to hunters in Epe and Ikorodu and traders in Epe, Ikorodu and Oyingbo. The hunters were all men, mostly young adults between age 21 and 40 years old hunted mainly for consumption. Similar pattern of hunting was observed in both Epe and Ikorodu with mammals constituting the highest population of hunted animals. Daily offtake of animals from the hunting site was between 1–10 animals with rodents being the highest. Hunting was significantly affected by season (P<0.001) with the highest number of catch in the dry season. The quantities of bushmeat purchased by traders were not significantly different (P>0.05) in the various markets. Bushmeat prices from hunters ranged from ₦1000 to ₦20,000. Bushmeat traders were older adults of 41-60 years (52%) of which 78.3% were women. About 63.3% (38) of traders sold only mammals while 36.7% (22) sold all types including mammals, reptiles and birds. Significant differences (P<0.05) were observed in the trader's average bushmeat purchase price as well as the average sales price. Highest selling price of bushmeat was recorded in Ikorodu while the lowest selling price was recorded in Oyingbo. Highest profit was reported by traders selling mammalian species of bushmeat. Sales was significantly affected by seasons (P<0.001), with the highest sales during the rainy season. Measures that would ensure sustainable utilization of bushmeat species should be established. Furthermore, the participation of the indigenous communities, hunters and traders should be harnessed for the success of this objective.

Key Words: Bushmeat, mammals, rodents, sustainable, indigenous

INTRODUCTION

The harvest of tropical forest wild life as bushmeat for food is an age long practice. However, consumption has increased dramatically in recent years. This has led to the loss of some species and to the so-called empty forest syndrome due to unsustainable hunting practices. The meat of the wild animal is one of the most valued tropical forest products after timber. Bushmeat is defined as the carcass of any non-domesticated terrestrial mammal, bird, reptile or amphibian harvested for the purpose of food (Nasi *et al.*, 2008). It is an important source of protein widely consumed in both rural and urban areas (Wilkie and Carpenter, 1999). The magnitude of its exploitations and consumption however varies from one place to the other and is determined principally by its availability. But this is also influenced by government control on hunting, socio-economic status and cultural prohibitions (Asibey, 1977). Commercial bush-meat hunting is a major threat to wild life throughout the Congo Basin forest (Fa *et al*., 2003). There is no doubt that overexploitation of wildlife for bushmeat in West and Central Africa is a serious issue which can lead to local, national or worldwide extinctions of targeted species, with tragic ecological and economic repercussions (Obioha *et al.*, 2012). The strongest signal of overhunting in an area is the observation of a decline in average body size of prey. Jerozolinski and

Peres (2003) have shown that a significant drop in mean body mass of mammals correlated with age of settlements indicative of different levels of hunting pressure. This is explicable by the fact that large bodied mammals bear the brunt of the initial offtake. Their population tend to recover, slowly, mainly due to low reproductive rates (Lahm, 1993; Peres, 2003). As a corollary to the loss of large game, higher exploitation rate of a greater range of smaller mammals occur as shown for Amazonian sites (Peres and Dolman 2000); conversely the presence of a greater volume of large bodied species may represent less hunted ecosystems.

Several analyses showed that National estimates of the value of the domestic trade in bushmeat range from US$42 to US$205 million across countries in West Africa and Central Africa (Davies, 2002). Bifarin *et al., (*2008) observed that in Ondo State, Nigeria there was no standardized method of price determination in bush meat marketing. Prices were determined by previous sales and cost of purchase. The value of meat varied according to the size of carcass, favoured taste, whether or not it was smoked or fresh, shot or trapped, which season, where sold and the bargain struck**.**

Ajayi (1991) reported that wild animal consumption among rural people in Nigeria's rainforest was 20% of their total animal protein intake compared to the 13% for the whole country. Decker (2003) estimated the monthly wildlife harvest by licensed resident hunters in the deciduous and rainforest region of Nigeria during the rainy season. Their study revealed that the animals most commonly harvested in the rainforest region were snails, squared giant rats, guinea fowl, bats, cane rats and porcupine. Monney (1994) stated that wild animals were generally superior to domesticated livestock in terms of feed utilization and they made the best use of existing local plants for food and could utilize a wider range of plants than domesticated livestock.

The rapidly growing timber industry has been a major factor in fuelling and facilitating this trade as it leads to deforestation, habitat loss, and easy access to animals. In addition, rural communities and forestry employees hunt for food and to generate income. The activities of commercial hunters who operate in the forest to supply the needs of forestry workers and to trade outside the forested region also increase the bushmeat trade. Human population growth and expansion into previously remote forest areas, urbanization and growing economy leads to increased demand for bush meat as delicacies in urban centres (Wilkie and Carpenter, 1999).

Most wild meat is sold in market or along trading points found in almost all towns and cities in the region. Bushmeat markets have been suggested as useful vehicle for studying fauna depletion due to high visibility of bushmeat markets (sales of most bushmeat is not forbidden and their comparative ease for collecting data on animals killed), Fa (2007). Despite such qualities what reaches a market is often a subset of what a trader or whole seller obtains from a hunter and what the hunter sells is a subset of what is brought out of the forest; this in turn is a proportion of what is actually killed (Coly *et al*., 1987; Cowlishaw *et al*, 2005). In a recent study, Allebone-Webb *et al.* (2011) tested the reliability of market data in reflecting village collection by comparing numbers from urban market and villages that supplied these markets. They demonstrated that it is possible to model the trade filters that are taken more into cognizance than market data opening the way to developing more robust market based sustainability indices for the bushmeat trade.

This study thus seeks to provide an up-to-date general picture of the hunters and traders (retailers) section of the bushmeat market in Epe, Ikorodu and Oyingbo areas in Lagos State, Nigeria. This study focuses on the consumption level of bushmeat in Lagos State markets, as well as how the hunting and trading rate affects the biodiversity of wildlife in the forests of Lagos State. This will highlight in Lagos State some of the factors responsible for the hunting and trading of bushmeat.

MATERIALS AND METHODS

Description of study area

The survey was carried out in three local markets where bushmeat is sold in large quantities namely; Chief Market in Epe, Sabo Market in Ikorodu and Oyingbo market in Lagos (Figure 1). The markets in Epe and Ikorodu are located close to the forest areas which appear to be high in biodiversity with high level of hunting representing rural markets while Oyingbo market is far from forest representing an urban market.

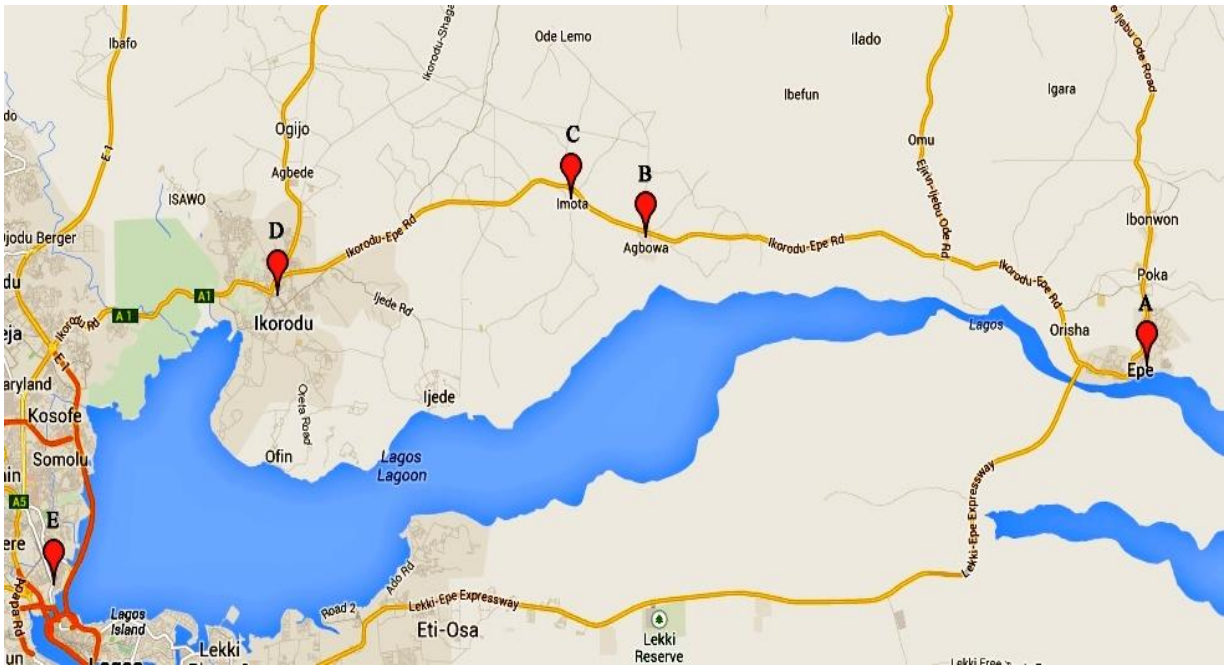

Fig. 1: Map of Lagos showing the study areas.

A = Epe N6.583996, 3.982716E, B = Agbowa N6.649939, 3.710584E, C = Imota N6.664635, 3.676446E, D = Sabo N6.619241, 3.507437E and E = Oyingbo market N6.480206, 3.383842E.

Research design and methodology

Two sets of semi-quantitative structured questionnaires were developed and validated by a specialist. Totally, one hundred and ten (110) were administered and received in all between July and October 2013. A set of 50 questionnaires were applied for hunters from the Epe and Ikorodu areas of Lagos State and a set of 60 for traders within the same localities including Oyingbo (Mainland LGA). It was considered appropriate because the study involved collecting information from hunting and market sites in three Local Government areas; Epe, Ikorodu and Oyingbo (Mainland LGA) in Lagos.

The hunters interviewed in this study were identified through the Hunters' Associations in Epe (Eredo Hunters Association) and Ikorodu (Ikorodu Hunters Association, Agbowa). Preliminary visits with letters of introduction were made to the different hunting associations. Subsequent visits were made during the meetings of the associations where the questionnaire were issued during their times of meeting. Questionnaires provided information on hunters' demographics, classes and quantities of animals hunted, to whom the animals were sold and the hunters selling prices among others.

Preliminary visits with a letter of introduction were made to each bushmeat market in Epe, Ikorodu and Oyingbo to identify the traders as well as to establish trust with the traders. Further visits were then made to administer the questionnaires to traders. Traders were interviewed during market period at the day time. Information was provided on the types, quantity, origin of the meat, amount purchased and sold. Free access to the carcass was provided which greatly helped in making proper species identification in addition to the information provided by the traders themselves.

After the administration of the questionnaires, the information obtained was collated for data analysis.

Statistical analysis

Data obtained from hunters and traders were analysed separately using the IBM® SPSS® Statistics 20 Package. Averages and frequencies were obtained from descriptive statistics and Chi square (χ^2) analysis was carried out on some of the results obtained.

RESULTS

Demographic variables for hunters

The socio-demographic characteristics of the hunters (Table 1) show a total representation of only the male sex.

Table 1. Percentage socio-demographic characteristics of hunters.

Variable	Attribute	Localities		Total
		Epe	Ikorodu	
Gender	Male	34	66	100
	Female	0	0	0
Age (Range in Years)	1-20	3	6	9
	21-40	33	29	72
	41-60	12	11	24
	≥60	2	4	6
Religion	Christianity	39	25	64
	Islam	14	18	32
	Traditional	2	2	4
Occupation	Solely Hunters	8	14	22
	Security Guards	11	25	36
	Traders	6	5	11
	Farmers	8	6	14
Ethnic groups	Artisan	3	4	7
	Yoruba	22	48	70
	Igbo	12	6	18
	Hausa	2	1	3
	Others	6	3	9

Twenty six (52%) hunters hunted mainly for consumption while 22 (44%) hunted mainly for sales. Hunting of bushmeat for medicinal purposes was of least importance accounting for only 2%.

Collection of hunters

Similar pattern of hunting was observed in both Epe and Ikorodu areas of Lagos State. Most of the hunters caught mammals (other than rodents) (47% Epe and 36 % Ikorodu). In Ikorodu, proportion of

hunters engaged in hunting rodents and reptiles were the same (27% rodents and 27 % reptiles); unlike Epe where the percentage of hunters hunting reptiles was greater than those that hunted rodents (18% rodents and 24% reptiles). Cumulatively from all sites, 46 hunters (92%) caught between 1-4 animals daily, 2 hunters (4%) caught 5 animals daily while another 2 hunters (4%) caught 10 animals daily.

Rodents which are members of the Class Mammalia had the highest daily offtake of 10, however only 2 hunters (4%) reported such. The highest daily catch of other mammals was 5, again only (4%) of hunters reported that; all the hunters who caught amphibians caught about 4 daily. None of the hunters reported hunting birds (Table 2).

Table 2: Daily collection of hunters relative to class of animals

Class of animals	Number caught per day						Total
	1	2	3	4	5	10	
Mammals (non-rodent)	0	7	5	6	2	0	20
Rodents	5	5	0	0	0	2	12
Reptiles	5	1	7	0	0	0	13
Amphibians	0	0	0	5	0	0	5
Aves							
Total	0	0	0	0	0	0	0
	10	13	12	11	2	2	50

Effect of season on hunting

Significant differences ($P<0.001$) were observed in the number of animals caught per day relative to the season of hunting. Hunters that reported a catch of 5 and 10 animals respectively hunted during the dry season See Table 3.

Bushmeat sales by hunters

Seventy four percent of the hunters sold to wholesalers while 26% sold to the final consumers. None of the hunters reported selling to retailers. Minimum daily sales were N1000 while maximum was N20, 000. Table 4 shows the average sales and quantity of bushmeat sold daily by hunters.

Traders demographic indices

The socio-demographic characteristics of the traders are shown on Table 5. Twenty five percent, 33.3% and 41.7% of the traders in this study sold at Epe, Ikorodu and Oyingbo markets respectively. 78.3 % of the bushmeat traders were of the female gender.

The quantity of bushmeat purchased by the traders was not significantly different between the various markets (Table 6)

Table 3: Effect of season on the daily collection at Epe and Ikorodu.

No of animals caught daily	Season			Total	χ^2 value	df	P value
	Dry season	Rainy season	All year round				
1	5	0	5	10			
2	8	0	5	13			
3	0	5	7	12			
4	0	11	0	11	49.52	10.00	0.001
5	2	0	0	2			
10	2	0	0	2			
Total	17	16	17	50			

Table 4. Average sales and quantity of bushmeat sold daily by hunters.

Average sales price (₦:K)	No of bushmeat sold			Total
	0-2.5	2.6-3.0	3.1-10	
1,000 - 4,250	11	1	6	18
4,251- 6,000	1	10	1	12
6,001- 11,000	6	6	0	12
11,001-20,000	7	0	1	8
Total	25	17	8	50

Table 5. Percentage **s**ocio-demographic characteristics of traders.

Variable	Attribute	Localities			Total
		Epe	Ikorodu	Oyingbo	
Gender	Male	5	7.5	9.2	21.7
	Female	20	25.8	32.5	78.3
Age (Range in Years)	Jan-20	2	1	3	6
	21-40	6	8	14	28
	41-60	8	18	26	52
	≥60	2	10	2	14
Religion	Christianity	15.5	12	17.5	45
	Islam	6	28	16	50
	Traditional	-	1.7	-	1.7
	Other religions	1.3	1	1	3.3
Occupation	Civil servants	3	4	4	11
	Teachers	2	2	5	9
	Traders	16	8	23	47
	Fashion designers	9	4	8	21
	Artisan	3	7	2	12
Ethnic groups	Yoruba	17.3	29.4	13.3	60
	Igbo	1.1	3	4.2	8.3
	Hausa	-	-	-	-
	Others	6.2	7	18.5	31.7

Table 6. Daily quantity of bushmeat purchased by traders

Qty of bushmeat		Place			Total	χ^2 value	df	P-value
		Epe	Ikorodu	Oyingbo				
1-5	Count	5	6	10	21			
	% within Qty of bushmeat	23.80%	28.60%	47.60%	100.00%			
6-10	Count	5	6	3	14			
	% within Qty of bushmeat	35.70%	42.90%	21.40%	100.00%			
11-20	Count	3	5	3	11			
	% within Qty of bushmeat	27.30%	45.50%	27.30%	100.00%			
21-70	Count	2	3	9	14			
	% within Qty of bushmeat	14.30%	21.40%	64.30%	100.00%			
Total	Count	15	20	25	60			
	% within Qty of bushmeat	25.00%	33.30%	41.70%	100.00%	6.745	6	0.345

Description of bushmeat species traded in Epe, Ikorodu and Oyingbo

About sixty three percent (38) of traders sold only mammals comprising rodents, pangolin, grasscutter, porcupine, antelope and monkeys among others. 36.7% (22) sold all types of bushmeat including mammals, reptiles (crocodile, monitor lizard, python, water turtle) and birds. There was no record of traders who sold only reptiles, only birds or only amphibians.

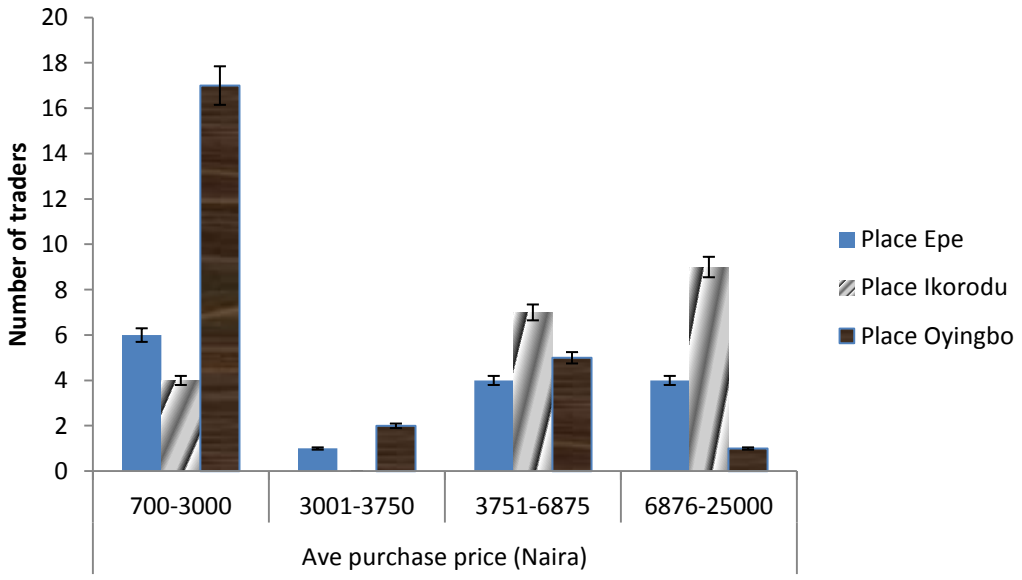

Fig. 2: Average daily purchase price of bushmeat in Epe, Ikorodu and Onyingbo

The average daily purchased prices of bushmeat in these markets are shown in Figure 2. Significantdifferences (P<0.05) were observed in the trader's average bushmeat purchase price. A significant difference was observed in the average sales price of bushmeat in Epe, Ikorodu and Oyingbo (Table 7). Highest selling price of bushmeat was recorded in Ikorodu while the lowest selling price was recorded in Oyingbo. Sales was significantly affected by the season (P<0.001) with the highest sales recorded in the rainy season (Table 8).

Table 7. Average sales price of bushmeat by traders

	Ave sales price (₦)							
Place	1000 - 3125	3126 - 5375	5376 - 9875	9876 - 30000	Total	chi – square	df	P-value
Epe	3	10	1	1	15			
Ikorodu	3	1	5	11	20			
						30.720	6	0.00002
Oyingbo	9	4	9	3	25			
Total	15	15	15	15	60			

Table 8. Effect of season on sales.

Average sales price (ASP) (₦)		Seasons		Total	χ^2 value	df	P value
		Rainy	Dry				
0 -3125	Count	7	8	15			
	% within ASP	46.7%	53.3%	100.0%			
3126 -5375	Count	12	3	15			
	% within ASP	80.0%	20.0%	100.0%			
5376 -9875	Count	14	1	15			
	% within ASP	93.3%	6.7%	100.0%	15.833	3	0.001
9876 -25000	Count	15	0	15			
	% within ASP	100.0%	0.0%	100.0%			
Total	Count	48	12	60			
	% within ASP	80.0%	20.0%	100.0%			

DISCUSSION

Hunting is mainly carried out by men who inherited this occupation from their fathers. Most of the hunters fell within the age bracket 21-40 years old. Bifarin *et al*., (2008) reported that this age group of people was active, brave and energetic since hunting as an occupation is risky and tedious in nature. Many of them (21-30 years) are rural young school leavers without jobs as well as adult men (31-40 years) married with children, who combine hunting with other jobs to meet household needs for consumption and income generation.

Pattern of hunting in both Epe and Ikorodu were similar as indicated by the proportion of the hunters in each area engaged in hunting different classes of animals. Most of the hunters engaged in hunting mammals. There were differences in the level of hunting reptiles and rodents in Epe and Ikorodu while none of the hunters hunted birds. Since the quantity of animals extracted by the hunters is a subset of the bushmeat in the forest and what is traded is a subset of that killed by the hunter, the low rate of consumption of amphibian, reptile and avian species may indicate reduced availability in the wild. Another possibility is that more edible species of mammals exists and with higher population, their availability in the wild is increased. Similar patterns in the class of animals hunted have been reported by several authors. Fa *et al.,* (2006) studied the magnitude of exploitation of bushmeat in the Cross-Sanaga river regions of Cross River in Nigeria and Cameroun. They observed that mammals represented 95%; reptiles 4.6%; birds 0.4% while amphibians were less than 0.04% of all carcasses counted during the study. In another study Fa *et al.,* (2005) analysed patterns and betweens site variations in hunter-kill profiles of mammals in tropical moist forests of West and Central Africa, they observed that ungulates (76.6%) followed by rodents (37%) were the most frequently hunted taxonomic group. IUCN (2000) as cited in Bowen-Jones *et al*., (2002) has identified hunting as a threat to 84 million mammal species and subspecies from West and Central Africa where the current animal harvested could exceed two million tones.

Majority of the hunters caught less than five animals daily. Only very few (4%) reported catching up to 10 animals daily and these were only rodents. Rodents such as squirrels, grasscutters, porcupines etc. were mainly caught because they may constitute the highest population of mammals within the forests of the region. Therefore averagely (five animals daily) a single hunter catches 35 animals weekly or 1,825 animals annually. Imagine the effect 50 hunters will have on the biodiversity of a particular forest ecosystem of Epe or Ikorodu!

There was seasonal effect on the number of animals caught daily. Highest daily catch of 5 and 10 animals were reported in the dry season. Reasons posited by the hunters were the effects of season on the abundance of the animals (32%), accessibility to hunting sites (30%) and ease of hunters' movement (12%). This observation corroborates Bifarin *et al*., (2008) observations that the highest level of bushmeat supply occurred during the dry season. Incessant bush burning during the dry season rid animals of their habitat and the search for food and water invariably exposes them to predators as well as hunters. Another factor affecting hunting as stated by both hunters and traders was the lunar cycle. Hunting rates were reportedly lower during the full moon because animals could easily detect hunters' movement and hide or flee for safety. There was however no period of the year when bushmeat hunting was forbidden. Hunters sold to wholesalers at a daily range of N1000 – N20,000 depending on the class of animals. On the average (N10,000) a single hunter sold an amount of N70,000 weekly or N3,650,000. This out rightly shows that hunting is a lucrative business. Therefore many jobless locals will engage in this occupation to ensure a steady inflow of income will have detrimental effect on the animal biodiversity eventually.

Women dominated the bushmeat trading unlike the hunting side of the bushmeat trade with 100% being male. This high level of women in the

bushmeat trade has been reported by several authors (Bowen-Jones 1998, Bowen-Jones, 2002). Most of the bushmeat traders (38%) were within the age bracket 41-50years old, followed by 31-40 years (33%). This is in contrast to Bifarin *et al.*, (2008) study in Ondo state, Nigeria where most of the traders were within the age group 21 -30 years. This could be that women want to complement the effort of their husband to provide the basic need of the families.

Most of the bushmeat sold in the rural markets such as Chief and Sabo markets in Epe and Ikorodu were usually sold off during the early hours of the day. Traders obtained bushmeat from surrounding and remote villages and arrived as early as 7am to the markets. By 9am most of the bushmeat were already sold. Many urban buyers patronizing the rural markets arrived the previous day before the market day to purchase bushmeat.

The quantity of bush meat purchased daily by traders with respect to their location Epe, Ikorodu and Oyingbo were relatively the same. However, the average purchase price of bush meat by traders per quantity and location showed significant differences ($P<0.05$). The market at Oyingbo had the lowest frequency of the low price range while the market at Ikorodu had the highest price range. This may be due to demand, size, taste and choice of the bushmeat by the customers. Oyingbo market is located within the city of Lagos, hence customers prefer their meat cut in to smaller pieces thereby reducing the prices. At Ikorodu most of the carcass of bushmeat is brought whole from the forest making it more expensive. Some of these are taken to Oyingbo where it is cut and sold in pieces which reduces the price.

Most of the traders sold only mammals (rodents inclusive). This may be due to the high demand, consumer preferences, as well as the high profit obtained from their sales. The high sale of these mammals is also based on the supplies of the hunters. As discussed earlier, this might be due to their relative higher population compared to other animals, hence their availability. The greater focus on mammals has been reported by several authors (Bowen-Jones, 1998; Fa *et al.*, 2006; Dupain *et al.*, 2012). The sale of bushmeat is actually a very lucrative business. A single trader makes an average profit of about N5,000 a day which translate to N35,000 a week/N1,820,000 annually. Many traders have this occupation as their only source of income to pay bills, school fees, association dues, transportation and secure food for their families. Therefore total abolition of this trade to protect wildlife diversity still remains a challenging task for conservationists.

Season had significant effect on sales with the highest being in rainy season. This is because during rainy season animals are scarce, thus there will be less supply and increased demand leading to higher prices and sales. From personal discussion, it was gather that hunters are less likely to go in to the forest during periods of heavy rain. Heavy rain brings about unfavourable terrain e.g. flooding, muddy patches, slippery path etc. which discourages most hunters. These periods lead to fewer availability of bushmeat. In bushmeat markets as in others markets, scarcity increases prices, low consumption and encourages substitution with alternative product (Albrechtsen *et al*., 2007).

Conclusion and Recommendations

There is a continuous demand and supply of bushmeat at the three markets of Epe, Ikorodu and Oyingbo. This trend is made possible by hunters that carryout indiscriminate hunting of wild animals. Hunting disrupts migration and hibernation patterns and destroys many populations of animals and hunters usually kill the strongest members of the population, thereby interfering with natural selection and weakening the population as a whole. Jobs should be created for young school leavers and alternative means of livelihood provided for hunters to reduce the level of bushmeat extraction from the wild. This would also serve as a source of regular and stable income since hunting is affected by season. Furthermore, the participation of the indigenous communities, hunters and traders should be harnessed for sustainable exploitation of bushmeat in Lagos. In this regard, the Hunters Association should be

utilized as a channel to educate hunters on vulnerable, threatened or endangered species within and around the Lagos forests which should not be hunted or sold to reduce the risk of extinction.

REFERENCES

Ajayi S. S. (1991). Bushmeat Production in the Tropics. Services LTD. p.129.

Albrechtsen, L. Macdonald, D.W., Johnson, P.J., Castelo, R. and Fa, J.E. (2007). Fauna loss from Bushmeat hunting: empirical evidence and policy implications in Bioko island. *Environmental Science and Policy,* 10:654-667.

Allebone-Webb S. M., Kumpel, N. F. Rist, J., Cowlishaw, G., Rowcliffe, J. M. and Miner-Gulland, E. J. (2011). Use of Market data to Assess Bushmeat Hunting Sustainability in Equatorial Guinea. *Conservation Biology,* 25:597-606.

Asibey, E. O. A. (1977). Readings in Agricultural Marketing. First Edition. Longman Nigeria Ltd. p.114

Bifarin, J. O., Ajibola, M. E. and Fadiyimu, A. A. (2008). Analysis of marketing bush meat in Idanre Local Government Area of Ondo State, Nigeria. *African Journal of Agricultural Research*, 3 (10): 667-671

Bowen-Jones, E. (1998). A Review of the Commercial Bushmeat Trade with Emphasis on Central / West Africa with Emphasis on The Great Apes. Report for the Ape Alliance c/o Fauna and Flora International. Great Eastern House, Tenison Road, Cambridge, CBI DDT, UK. 48pp.

Bowen-Jones, E. and Pendry, S, (1999). The threat to primates and other mammals from the bushmeat trade in Africa and how this threat could be diminished. *Oryx*, 33:233-246.

Bowen-Jones, E., Brown, D. and Robinson, E. (2002). Assesment of the solution–oriented research needed to promote more sustainable bushmeat trades in Central and West Africa. Report for the Department for Environment Food and Rural Affairs, Wildlife and Countryside Directorate, London, UK. Available online at: *www.defra.gov.uk/wildlife-countryside/resprog/findings/bushmeat.pdf* .

C Coly, M. M., Dudu, A. Mbacle, M. (1987). Donnees Surj Exploitation Du Petitei At Moyen Giber Des Forests Ombrophiles Dus Zaire. In International Symposium And Conferences On Wildlife Management In Sub-Saharan Africa: UNESCO, Paris. Pp.110-145

C Cowlishaw, G., Mendelson, S. and Rowcliffe, J. M. (2005). Evidence for Post-Depletion Sustainability in a Mature Bushmeat Market. *Journal of Applied Ecology* 42(3):460-468#

DDavies, G. (2002). Bushmeat and International Development. *Conservation Biology*, 3: 125-132

DDecker, O. (2003). Agricultural Economies and Marketing of Wildlife in the Tropics. Longman Group UK. Ltd. P 60

DDupain, J., Nackoney, J., Mario Vargas, J., Johnson P. J., Farfan, M. A., Bofaso, M. and Fa, E. J (2012). Bushmeat Characteristics Vary with Catchment Conditions in a Congo Market. *Biological Conservation*, 146: 32-40

F Fa, J. E., Currie, D. and Meeuwig J. (2003). Bushmeat and Food Security in Congo Basin – Linkages between Wildlife and Peoples Future. *Environmental Conservation,* 30 (1):71-78.

F Fa, J. E., Ryan ,S. F. and Bell, D. J. (2005). Hunting vulnerability, ecological characteristics and harvest rates of bushmeat species in afrotropical forests. *Biological Conservation*, 121: 167–176.

Fa, J. E., Seymour, S., Dupain, J., Amin, R., Albrechtsen, L. and Macdonald, D. (2006). Getting To Grips with the Magnitude of Exploitation: Bushmeat in the Cross–Sanaga Rivers Region of Nigeria and Cameroon. *Biological Conservation.* 129: 497–510.

Fa, J. E., (2007). Bushmeat Markets – White Elephants or Red Herrings. In: *Bushmeat and Livelihoods: Wildlife Management and Poverty Reduction*, (Davies, G., and Brown, D. Eds.). Blackwell, Oxford publishers. Pp.47-60.

International Union for the Conservation of Nature (IUCN) (2000). Red list of threatened species.IUCN, Gland, Switzerland. Available: http//www.iucnredlist.org. (Accessed May, 2014).

Jerozolinski, A. and Peres, C. A. (2003). Bringing Home the Biggest Bacon: A Cross-Site Analysis of the Structure of Hunter Kill Profiles in Neotropical Forests. *Biological Conservation,* 3: 415-425

Lahm, S. A. 1993. Utilization of Forest Resources and Local Variation of Wildlife Population in Northern Eastern Gabon. In: *Tropical Forest People and Foods.* UNESCO and Parthenon Publishing Group, Paris. Pp. 213-226.

Monney, K. A. (1994). Notable notes on giant African snails. *Snail Farming Research* by The Italian Snail faming Association. 5:7-15.

NNasi, R., Brown, D., Wilkie, D., Bennett, E., Tutin, C., van ToL G. and Christophersen, T. (2008). Conservation and Use of Wildlife-Based Resources: The Bushmeat Crisis. Secretariat of The Convention on Biology Diversity, Montreal and Center For International Forestry Research: (CIFOR), Bogor. CBD Technical series No: 33.

OObioha, E. E., Isiugo, P. N., Jimoh, S. O., Ikyaagba, E., Ngoufo, R., Serge, B. K. and Waltert, M. (2012). Bush Meat Harvesting and Human Subsistence Nexus in the Oban Hill Communities of Nigeria. *Journal of Human Ecology*, 38(1): 49-64

P Peres, C. A., and Lake, I. R., (2003). Extent of Non Timber Resources Extraction in Tropical Forests: Accessibility to Game Vertebrates by Hunters in the Amazon Basin. *Conservation Biology* 17: 521-537.

P Peres, C. and Dolman, P.M. (2000). Density Compensation in Neotropical Primates Communities. *Oecologia* 122: 175-189.

R Robinson, J. G. and Bodmer, R. E. (1999). Towards Wildlife Management in Tropical Forests. *Journal of Wildlife Management*, 63: 1-13.

Wilkie, D. S. and Carpenter J. F. (1999). Bushmeat hunting in the Congo Basin: An Assessment of Impacts and Options for Mitigation. *Biodiversity and Conservation* 8 (7): 927-955.