

## **The Impacts of Bushmeat Exploitations on the Conservation of Wildlife in Nigeria**

**ALARAPE A. A.<sup>1</sup>, SHUAIBU, R. B.<sup>2</sup>, YADUMA, Z. B.<sup>3</sup>**

<sup>1</sup>*Department of Wildlife and Ecotourism Management, Faculty of Renewable Natural Resources, University of Ibadan, Oyo State, Nigeria*

<sup>2,3</sup>*Department of Forestry and Wildlife Management, School of Agriculture and Agricultural Technology, Modibbo Adama University of Technology, Yola, Adamawa State, Nigeria*

**ABSTRACT:** This paper examines the impacts of exploitation of wild animals as bush-meat on the conservation of wildlife in Nigeria. This study was carried out in Six (6) States of Nigeria namely Abia; Bauchi; Edo; Kogi; Ondo; and Zamfara State which represents the six geo-political zones of Nigeria namely South-East; North-East; North-Central; South-West; South-South; and North-West in the country. Data were collected from two Local Government Areas (LGAs) which were randomly selected from each of the six states making twelve LGAs within the Study Area using structured questionnaire; oral interview of respondents; and visual observation. The data were analyzed using descriptive statistics involving tables and figures. Two-factor without replication Analysis of Variance (ANOVA) was used to analyze the differences in the wildlife species mostly hunted. The results revealed that Twenty-Six (26) wild animal species were recorded as bush-meat in the Study Area. Eleven percent (11.0%) of the 26 species of bush-meat were recorded in Abia State; 23.0% in Bauchi State; 11.0% in Edo State; 17.0% in Kogi State; 21.0% in Ondo State; and 17.0% in Zamfara state. The wild animals' exploitation rate shows that the month of March had the highest exploitation rate (25.0%) while the month of September has the lowest extraction rate (8.0%). Most of the respondents (80.3%) in the Study Area carried out hunting activities for income generation while 19.7% respondents carried out hunting activities for food. The results of ANOVA two-factor without replication of the hunted wild animals in the Study Area indicated that there were significant differences ( $P\text{-value} < 0.05$  and  $F\text{-calculated} > F\text{-critical}$ ) in the wild animal species mostly hunted. This is a pointer to the fact that there will be negative impact of wild animal exploitation on the conservation of wildlife, if nothing is done to reduce hunting activities for income generation.

**Key Words:** Bush-Meat; Wildlife Conservation; Meat Exploitations; Impacts; and Wild Animals

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### **1. INTRODUCTION**

Nigeria is a country of over 200 million people and a home for vast wildlife hunting and trade. Nigeria has 274 mammal species, over 20 species of primates 154 reptiles, 53 amphibians, over 20,000 insects' species, 109 snails' species and 899 species of birds (Happold, 2000). A wide array of animals, including endangered species such as elephant, apes, and pangolins are hunted to feed both domestic and international demand for bush-meat and body parts. In Nigeria, uninhabited forest is generally referred to as 'the bush', and the wildlife animals or undomesticated animals derived from it is referred to as bush-meat. Aduloju (2012) stated that the term bush-meat applies to all wildlife species, a number of which are threatened or endangered species, used for meat including: elephant (*Loxodonta africana*); gorilla (*Gorilla gorilla*); chimpanzee (*Pan troglodytes*) and

primates; forest antelope (duikers); porcupines, bush pigs; cane rat (*Thryonomys swinderianus*); pangolins (*Manis spp*); monitor lizard (*Veranus niloticus*); guinea fowl (*Numida meleagris*); etc. Bush-meat or wild meat generally refers to the undomesticated animals acquired from their natural settings such as forest and rivers/rocky places surrounded by forest which are normally consumed as meat as an alternative to the meat from livestock or domesticated animals. (Okiwelu *et al*, 2009) stated that bush meat trade and hunting have been identified as very significant cause of the collapse in the sustainability of biodiversity and wildlife supply. Bush-meat often represents both the primary source of animal protein and a main cash-earning commodity for the rural inhabitants of the forest regions.

With the increase in the demand for bush meat consumption and income generation from its sales, hunting activities will also increase to meet up with the rising demand and this can result in unrestricted pressure on the wild animals which will definitely reduce their population in their natural settings and therefore, a drawback in their conservation. According to Asibey (1977) the magnitude of wild animal exploitation 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. Terrestrial mammals are experiencing a massive collapse in their population sizes and geographical ranges around the world, but many of the drivers, patterns and consequences of this decline remain poorly understood (Ripple *et al.*, 2016). According to Darimont *et al.* (2015), the unsustainable hunting for consumption and trade of wild meat (also known as bush-meat) by humans represents a significant extinction threat to wild terrestrial mammal populations, perhaps most notably in parts of Asia, Africa and South America. Nasi *et al.* (2008) in their study on conservation and use of wildlife-based resources stated that the global bush-meat hunting crisis is a fundamentally distressing problem to address because it is intimately tied to human development challenges such as food insecurity, emergent disease risks and land-use changes. The International Union for Conservation of Nature IUCN (2015) revealed that 1169 of the world's 4556 assessed terrestrial mammals (approx. 26.0%) are listed as threatened with extinction. Exploitation of wild meat for consumption and income generation by selling the carcass/body parts has been long acknowledged as a very serious issue for a range of mammal species which can results in very serious alterations of ecosystems. Galetti and Dirzo (2013) opined that the pervasive pressure on ecosystems can have wide-ranging effects that cascade beyond the loss of the hunted species, altering the structure and function of the environments in which they occur and the services they provide.

Many of the wildlife animal species threatened by hunting remain poorly studied and are greatly in need of basic biological and ecological research, including simple evaluation of their remaining numbers and if nothing is done their survival will depend on the balance between supply and demand. Therefore, to achieve better conservation policies and practices for our surviving wild animals, the wildlife scientist must first provide a better platform for decision-making in identifying changes in wildlife populations and ecosystems to curb the unsustainable consumption of those species that are greatly declining or threatened so as to maintain viable and functional populations of the species. The objective of these study is to examine the impacts of wildlife exploitations as bush-meat and its implications for the conservation of wildl animals in Nigeria.

## 2. METHODOLOGY

### The study Area

This study was carried out in Six (6) States of Nigeria namely Abia; Bauchi; Edo; Kogi; Ondo; and Zamfara States which represents the six geo-political zones of Nigeria namely South-East; North-East; South-South; North-Central; South-West; and North-West respectively, in the country. Nigeria is a country in West Africa, it lies on latitude 8°N and longitude 10°E. It has a total area of 923,768km<sup>2</sup> (Wikipedia) with a population of 206,760,319 (UN, 2020). Nigeria is bounded by Benin on the South-West region, Cameroun on the South-East region, Niger on the North-West region, Lake Chad on the North-East region, and Atlantic Ocean to the South-South region.



**Figure 1: Map of Nigeria Showing the Study Area**

### Data Collection

Data were collected from two Local Government Areas (LGAs) which were randomly selected from each of the six states making twelve LGAs within the study area using structured questionnaire; oral interview of respondents; and visual observations. The LGAs are: Ohafia and Isuikwuato in Abia State; Alkaleri and Ganjuwa in Bauchi State; Uhunmwode and Esan West in Edo State; Lokoja and Ofu in Kogi State; Owo and Akoko North West in Ondo State and Zurmi and Shinkafi LGA in Zamfara State. Bush meat markets, major markets, roadsides markets, and some of the hunter's houses were visited once in two months for a whole year (January, March, May, July, September, and November, 2019). Visual observations and the recordings of live and processed animals on display, skin, feather, scales, hooves, ivory, and horns were done at the site and the hunters/the traders were interviewed orally to determine the species of animals on display. Structured questionnaire were administered on Twenty-Five (25) selected hunters/traders/farmers from each of the LGAs making Fifty (50) respondents in each State and a total number of Three-Hundred respondents in the Study Area.

### Data Analysis

The data were arranged in Microsoft Excel spreadsheet and analyzed using descriptive statistics involving tables and figures. Two-way Analysis of Variance (ANOVA) without replication was used to analyze the differences in the wildlife species mostly hunted.

## 3. RESULTS

The results of this study include the Socio-Demographic distribution of respondents as shown in table 1; the animal species composition exploited as bush meat in the Study Area shown in table 2; the exploitation rate of wild animals as bush meat in the Study Area in figure 2; reasons for the exploitation of wild animals in the Study Area in figure 3; and Two-way ANOVA results in table 3 on differences in the exploitation rate of wild animal species mostly hunted in the Study Area.

### Socio-Demographic Analysis of Respondents

Socio-Demographic analysis was obtained through descriptive statistics which provides simple summaries about the sample and about the observations that have been made. According to Mann (1995), Descriptive statistics is the discipline of quantitatively describing the main features of information collected, or the quantitative description itself.

Table 1 below presents the summary of respondents' gender status; educational level; marital status; and occupational status. The gender total result showed that One Hundred and Eighty-One (181) respondents were male while One Hundred and Nineteen (119) respondents were female. There were more women respondents in Abia State (28); Edo State (29); Kogi State (32); and Ondo State (27); compared to women in Bauchi State (2) and Zamfara State (1). This is because women in North-East and North-West were not involved in farming, hunting, trading and other activities in the Study Area. According to Agarwal (2001), the ability to participate and the terms of participation are shaped by a number of factors, including rules of entry, social norms, perceptions, and the assets and attributes of those affected. Educational status shows that One Hundred and Six (106) of the respondents had informal education; 120 had primary education; 56 respondents had secondary education; and 18 respondents had tertiary education. The results shows that One Hundred and Seventy-One (171) of the respondents were married; 91 were single/divorcee; and 38 were widow/widower. Occupational status of the respondents shows that Sixty-Nine (69) were farmers; 111 respondents were hunters; 108 respondents were traders; and 12 were civil servants.

**Table 1: Socio-Demographic Characteristics of Respondents in the Study Area**

Variables	Abia State	Bauchi State	Edo State	Kogi State	Ondo State	Zamfara State	Total
Gender							
Male	22	48	21	18	23	49	181
Female	28	02	29	32	27	01	119
Total	50	50	50	50	50	50	300
Educ.Level							
Informal	11	28	14	09	03	41	106
Primary	29	16	26	25	18	06	120
Secondary	08	04	07	12	22	03	056
Tertiary	02	02	03	04	07	00	018
Total	50	50	50	50	50	50	300
Marital Status							
Married	18	31	27	30	28	37	171
Single/Divorce	23	12	19	13	16	08	091
Widow/er	09	07	04	07	06	05	038
Total	50	50	50	50	50	50	300
Occupation							
Farming	08	14	09	12	11	15	069
Hunting	16	22	18	15	21	19	111
Trading	25	12	21	20	17	13	108
Civil Servant	01	02	02	03	01	03	012
Total	50	50	50	50	50	50	300

Source: Authors Survey, 2019.

### The Wild Animal Species Composition Exploited as Bush Meat in the Study Area

Twenty-Six wild animal species were recorded as bush-meat in the Study Area. Eleven percent (11.0%) of the 26 bush-meat species were recorded in Abia State; 23.0% in Bauchi State; 11.0% in Edo State; 17.0% in Kogi State; 21.0% in Ondo State; and 17.0% in Zamfara. The result revealed that Bauchi State recorded the highest wild animals exploitation for bush meat; followed by Ondo State; followed by Kogi State and Zamfara State; Abia State and Edo State. Table 2 shows the details of the report. This study also revealed that *Thryonomys swinderianus* (Grasscutter) was the most hunted species (878), while the least hunted was *Hippopotamus amphibious* (Hippopotamus) (27) as shown in table 2. The effect of grass-cutter hunting is still minimal because grass-cutter is very prolific, but the effect of Hippopotamus hunting is very devastating since the animal is an endangered species. *Manis tricuspis* (Long-tailed Pangolin) hunting was on the high side (672) which could result in the species extinction since it is already an endangered species. According to the Netherlands-based Wildlife Justice Commission (2020), 55% of pangolin scales seized globally between 2016 and 2019 were linked to Nigeria. *Atherurus africanus* (Brush-Tailed Porcupine) (620) and *Hippotragus equinus* (Roan antelope) (532) also had high level of hunting which will endangered the species in the near future. Figure 2 shows some of the bush meat species in the Study Area.

**Table 2: The Wild Animal Species Composition Exploited as Bush-Meat in the Study Area**

S/N	Scientific Name	Common Name	Abia State	Bauchi State	Edo State	Kogi State	Ondo State	Zamfara State	Total	Percentage (%)
1	<i>Atherurus africanus</i>	Porcupine	53	132	73	85	129	148	620	9.29
2	<i>Bdeogale nigripes</i>	Mongoose	77	91	43	41	116	63	431	6.46
3	<i>Cercopithecus tantalus</i>	Tantulus Monkey	9	84	13	62	18	67	253	3.79
4	<i>Chaerephon nigeriae</i>	Bat	49	46	32	73	62	41	303	4.54
5	<i>Choeropsis amphibius</i>	Pigmy hippopotamus	6	25	4	12	16	2	65	0.97
6	<i>Cricetomys gambianus</i>	African giant rat	8	27	31	15	39	22	142	2.13
7	<i>Crocodilus niloticus</i>	Nile Crocodile	58	80	50	68	60	48	364	5.45
8	<i>Crocuta crocuta</i>	Spotted hyena	8	33	6	14	11	29	101	1.51
9	<i>Epixerus ebii</i>	Tree squirrel	29	76	31	33	48	53	270	4.05
10	<i>Erythrocebus patas</i>	Patas Monkey	4	22	5	44	9	24	108	1.62
11	<i>Felis silvestris</i>	Fox	32	38	18	15	22	39	164	2.46
12	<i>Hippopotamus amphibius</i>	Hippopotamus	1	9	1	8	6	2	27	0.40
13	<i>Hippotragus equinus</i>	Roan antelope	52	137	49	126	133	35	532	7.97
14	<i>Loxodonta africana.</i>	African bush elephant	2	21	4	1	14	6	48	0.72
15	<i>Manis tricuspis</i>	Long-tailed Pangolin	105	113	97	88	174	95	672	10.07
16	<i>Numida meleagris</i>	Guinea fowl	4	133	7	82	6	148	380	5.69
17	<i>Panthera pardus</i>	Leopard	1	6	1	3	18	2	31	0.46
18	<i>Papio anubis</i>	Baboon	2	23	3	4	2	21	55	0.82
19	<i>Potamocheorus spp</i>	Bush pig	16	29	36	18	39	17	155	2.32
20	<i>Python sabae</i>	Rock Python	17	83	15	21	47	32	215	3.22
21	<i>Sylvilagus brasiliensis</i>	Rabbit	16	61	21	35	48	59	240	3.60
22	<i>Syncerus caffer</i>	Buffalo	1	27	2	14	12	6	62	0.93
23	<i>Thryonomys swinderianus</i>	Grass cutter	126	145	129	131	210	137	878	13.16
24	<i>Tragelaphus scriptus</i>	Bush buck	12	19	23	18	49	14	135	2.02
25	<i>Veranus niloticus</i>	Nile Monitor Lizard	45	63	32	96	87	45	368	5.51
26	<i>Viverra civetta</i>	African civet	4	8	6	11	24	2	55	0.82
Total			737	1531	732	1118	1399	1157	6674	100
%			11	23	10	16	20	17	100	

Source: Authors Survey, 2019.





a) GRASSCUTTER



b) RABBIT



c) ANTELOPE

Figure 2: Some of the Wild Animal Species as Bush-Meat in the Study Area

### Wild Animals Exploitation Rate between January and November, 2019

The wild animal's exploitation level in figure 3 shows that the month of March had the highest exploitation rate (25.0%) while the month of September had the lowest exploitation rate (8.0%). The month of January had exploitation rate of 23.0%; followed by November (18.0%); followed by May (17.0%); and followed by July (9.0%). From the result of this study, it shows that many of the hunters exploits the wild animal not only for food but for income generation. This is because the month of March having the highest exploitation rate is due to the fact that there are no new harvests of food products, at the same time the prices of food products rises at this period of the year. In order to cope with the situations, the hunters and the farmers added more efforts in hunting for food and to generate income. The month of September having the lowest exploitation rate revealed that most of the farm produce are ready for harvest, as such there are improvement on the condition of living from the sales of the harvests and falls in the prices.

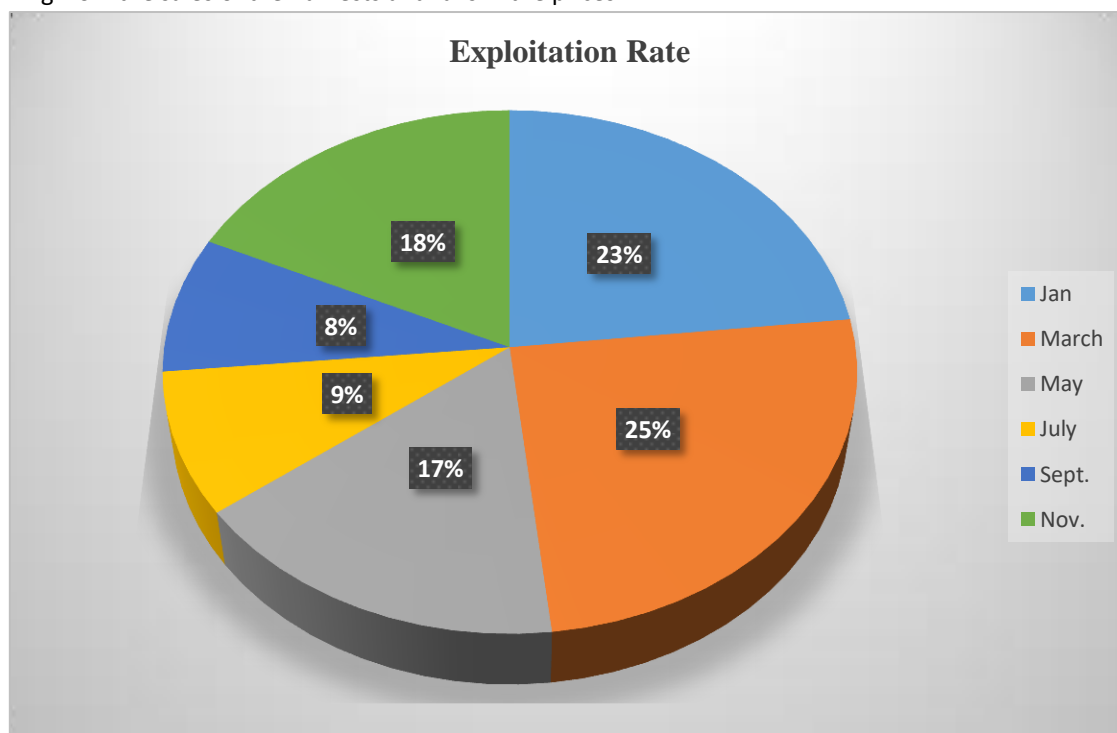


Figure 3: Exploitation Rate of Wild Animals. Source: Authors Survey, 2019

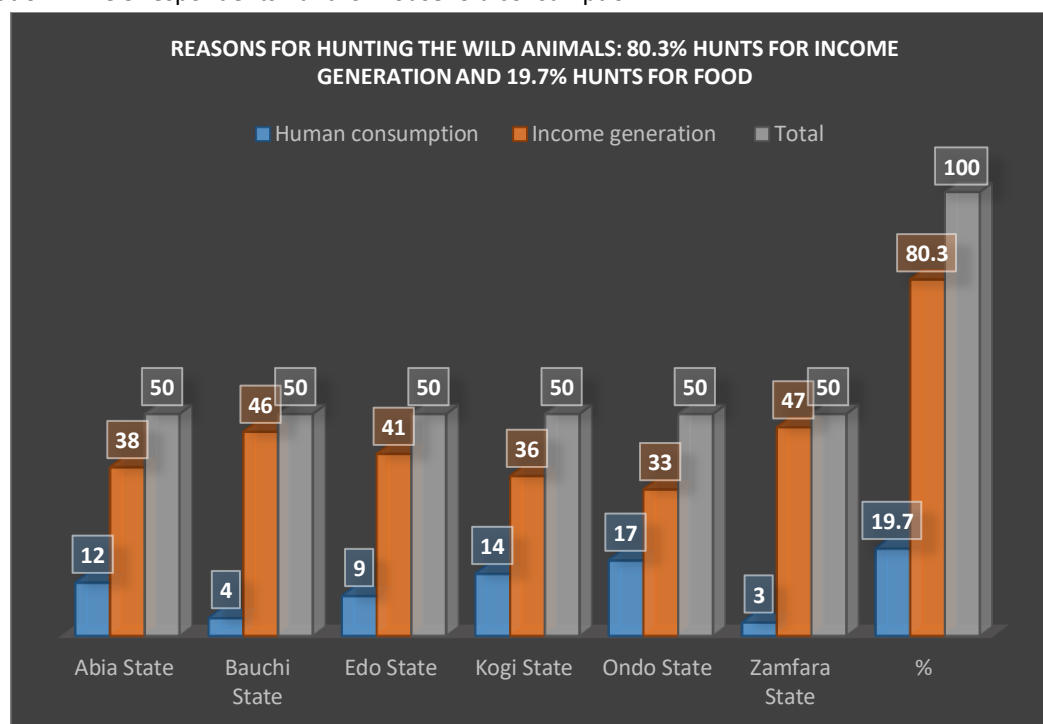
### Reasons for Wild Animals Exploitation in the Study Area

Overexploitation of different species of wild animals is the key reason for the reduction of some species of wild animals in Nigeria. This high exploitation of wildlife resources is done without considering their conservation and as such leads to extinction of these animals in the wild (Tanko and Wada, 2020). As a result of the present economic meltdown and socio-inequality experience in our society today, bush-meat is now the last resort to the common man in rural areas and a dynamic source of protein for individuals in the urban areas (Tanko and Wada, 2020). Wild animals constitute a valuable food resource which cannot be easily withdrawn without causing wide-ranging socio-economic imbalances (Secretariat, 2011). Creating alternative livelihood options and exploring options for producing alternative sources of protein have potential to reduce reliance of local people on exploiting wildlife populations to survive and could help to improve standards of living (Van Vliet, 2011).

Majority (80.3%) of the respondents in the study area carried out hunting activities for income generation while 19.7% respondents carried out hunting activities for food. Figure 4 shows that 38 respondents in Abia State hunt wild animals for income generation while 12 respondents hunt for household consumption. Forty-six respondents in Bauchi State carried out hunting activities for income generation while 4 respondents hunt for human consumption. Forty-on respondents in Edo State hunt wild animals for income generation while 9



respondents hunt for household consumption. Thirty-six respondents in Kogi State carried out hunting activities for income generation while 14 respondents are for household consumption. Thirty-three respondents in Ondo State carried out hunting activities for income generation while 17 respondents hunt for household consumption. Forty-seven respondents in Zamfara State carried out hunting activities for income generation while 3 respondents hunt for household consumption.



**Figure 4: Reasons for Hunting the Wild Animals. Source: Authors Survey, 2019**

#### ANOVA Two-Factor without Replication Result

The results of ANOVA two-factor without replication in table 3 of the hunted wild animals in the Study Area showed that F-calculated (17.79452) is higher than F-critical (1.581024) at alpha level of 0.05 and the P-value (2.96E-31) is less than 0.05 alpha level. It is therefore concluded that there are significant differences (P-value < 0.05 and F-calculated > F-critical) in the wild animal species mostly hunted.

**Table 3: ANOVA Two-Factor Without Replication Result**

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Rows	210520.7	26	8096.949	17.79452	2.96E-31	1.581024
Columns	20185.75	5	4037.151	8.872371	2.86E-07	2.283931
Error	59153.25	130	455.025			
Total	289859.7	161				

The ANOVA results also shows that there are significant differences in the exploitation rate of wild animals in the Study Area [F-calculated (8.872371) is higher than F-critical (2.283931) at alpha level of 0.05 and the P-value (2.86E-07) is less than 0.05 alpha level].

#### 4. CONCLUSION

Bush meat as a forest product is very important to both rural and urban dwellers in Nigeria. The result of this study has shown that the five (5) most hunted wild animal species in the Study Area were *Thryonomys swinderianus* (Grass Cutter); followed by *Manis tricuspis* (Long-tailed Pangolin); followed by *Atherurus africanus* (Brush-Tailed Porcupine); *Hippotragus equinus* (Roan antelope); and followed by *Bdeogale nigripes* (Mongoose). Most of the respondents exploited wild animals for income generation which can impact negatively on their population in their natural settings and therefore, a drawback in their conservation. Due to too much and unrestricted pressure on the available wild animals, the ecological system is been affected. In order to halt or reduce the excessive exploitation of wild animals, the demand for it must be controlled through regulation, persuasion or provision of alternatives such as wild animal farming, and by increasing wildlife numbers through adequately enforced protection of existing populations and wild spaces.

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**INFO:-**

**Corresponding Author:** SHUAIBU, R. B, Department of Forestry and Wildlife Management, School of Agriculture and Agricultural Technology, Modibbo Adama University of Technology, Yola, Adamawa State, Nigeria

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