

Conservation and Sustainability of Hunted and Traded Wild Animals in Federal Capital Territory, Abuja (Nigeria): Perceptions and Implications

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ABSTRACT: *Anthropogenic activities pose a significant threat to wildlife, including hunting, trading, overexploitation of docile species, climate change, habitat loss from deforestation, encroachment into natural habitats, and general construction. The loss of wild animal species has far-reaching impacts on the environment and its inhabitants. This study assessed the hunting, trading, and values of wild animals in the FCT, and its implications for conservation and sustainability. The research focused on six selected areas because of their diverse species and rapid development. The study took a mixed methods approach, combining qualitative and quantitative research. Data analysis involved SPSS for quantitative data and a non-parametric Chi-Square test for qualitative data. Stakeholders' perceptions were analyzed using the Likert scale. The results showed that most respondents were unskilled males under 35 years old. Mammals, birds, and reptiles were the most hunted and traded animals, with uncertainty about the present status of many species. Human activities were identified as the main cause of population decline, with trapping being the most common hunting method. The trade of wild animals for food was prevalent, and the awareness of wildlife conservation was low. The study emphasized the need for targeted conservation awareness programs to enhance people's understanding of the dangers associated with trading and consuming wild animals in the study areas. These findings revealed a bleak future for threatening wild animal populations and highlighted the potential risk of zoonotic disease transmission between animals and humans.*

KEYWORD: Conservation awareness, wildlife trade, habitat loss, hunting, stakeholders' perceptions

INTRODUCTION

Nigeria possesses abundant and diverse ecosystems, exhibiting a remarkable range of life forms known as biodiversity. This encompasses an array of fauna and flora, encompassing over 1,800 animal species, including 274 mammals, 860 birds, and approximately 4,600 plant species (Mbaya and Malgwi, 2014). As a result, Nigeria holds the highest rank in terms of biodiversity. However, the effective conservation and management of wildlife face significant challenges in Nigeria, primarily attributed to the absence of adequate conservation laws. Other factors contributing to these challenges include land clearance for agricultural purposes, unregulated logging, excessive firewood collection, overgrazing, deforestation, hunting of bush meat, and uncontrolled bush burning (FAO, 2015).

For the past six million years, humans have been acknowledged as consumers of bush or wild meat. Presently, wildlife hunting persists in both high and low forest areas, as well as in Savanna regions, particularly within the Federal Capital Territory. This hunting serves as a source of protein and income for rural communities, and sometimes, the animals are obtained for trophies or other purposes. However, if the hunting of bush meat and deforestation remain unregulated, several consequences can arise. These include the loss of dietary protein, micronutrients, and income for impoverished rural populations (Nasi *et al.*, 2008). The cultural identities of many rural inhabitants, for whom hunting is an integral heritage and a significant aspect of their cultural identity, may be severely affected. These activities have resulted in the depletion of forests and savannas, causing the disappearance of large-bodied vertebrates and other species. This has had a devastating effect on the ecological balance and functioning of these ecosystems, as these species play crucial roles (Abernethy *et al.*, 2013).

In the savanna region, a significant portion of the population relies on wild meat and the sale of firewood as primary sources of protein and income, with limited alternatives available. The hunting of wild meat in this area can be exceptionally intense, posing a serious threat to the populations of various animal species. Throughout the entire Nigerian savanna region, the trade in wild meat remains a profitable enterprise, serving as a vital means of sustenance for rural communities. In agricultural areas where farming is the primary income source, wild meat serves as a lucrative business for rural communities. While wild meat is relatively inexpensive and easily accessible in rural regions, urban areas typically witness higher prices, with its utilization often attributed to traditional medicine and cultural practices rather than nutritional purposes (Ruheza *et al.*, 2014). The economic dynamics of the wild meat industry involve a commodity food chain, involving hunters/farmers, wholesalers, market vendors, and local restaurant owners many times.

The residents of Nigeria's savanna region heavily rely on the biodiversity present in their surroundings for sustenance and income. However, the extensive hunting of various species has led to a decline in their populations, resulting in a biodiversity crisis (Milner-Gulland *et al.*, 2013; Lindsey *et al.*, 2015). To mitigate this crisis, it is essential to establish alternative options, particularly for urban populations (Bonan, 2014). While per capita consumption of wild meat is already high among urban dwellers, the overall consumption in urban areas can be even higher. When there is a decline in the supply of wild meat, urban inhabitants often turn to other sources of meat as substitutes. However, this shift leaves rural dwellers vulnerable to food supply shocks (Bennett, 2002). This study aims to determine the extent of wild meat consumption in the six area councils of the Federal Capital Territory (FCT), identify the hunted and traded species, and assess their values. It evaluates the awareness and effectiveness of conservation strategies in promoting the survival of threatened species in the study areas.

METHODOLOGY

Study Areas

The study took place in Abuja, the Federal Capital Territory (FCT) of Nigeria, situated between latitudes 9°03' and 9°07'N and longitudes 7°26' and 7°39'E, in the North central region of the country. Abuja has a tropical wet and dry climate, characterized by a warm and humid rainy season, as well as a scorching dry season known as harmattan. The harmattan season is marked by dust haze, increased coldness, and aridity, influenced by the northeast trade wind. The FCT receives rainfall because of its location on the windward side of the Jos Plateau and the area where air masses rise. The selection of the study sites, which comprised the Six Area Councils, was based on the presence of diverse animal and plant species within these locations and the rapid developmental changes that have taken place.

The study sites chosen for this study are situated within the guinea savanna ecosystem of the North central region in Nigeria. According to Balogun *et al.*, (2010), Abuja city's mountainous terrain contributes to orographic activities, resulting in substantial and frequent rainfall throughout the rainy season. The rainy season typically starts in March and concludes in November, with September being the peak month characterized by abundant rainfall. The average annual rainfall in Abuja ranges from 1000 mm to 1600 mm. The mean monthly temperature ranges from 25.8°C to 30.2°C.

Method of Data Collection

Research design

This study aimed to achieve several key objectives, including identifying the wildlife species present in the Federal Capital Territory (FCT) and determining the quantities being used. To

gather data, direct observation was employed, involving field visits to assess the activities of the local communities. The activities and the inhabitants' primary engagements were recorded, alongside their perspectives on wildlife conservation, using simple percentages, tables, and bar charts. In conducting the research, a mixed methods approach was adopted, which combines qualitative and quantitative research paradigms (Creswell, 2003). This approach allows for a comprehensive and holistic understanding of the research topic by incorporating diverse research methodologies.

The interview method was chosen for its reliability, as supported by Ezealor (2012) and Osemeobo, (2014). Each interview session with farmers and hunters lasted approximately 20-30 minutes, providing the interviewees an opportunity to express their perspectives on the topic under investigation. Twenty bush meat markets were selected and visited, representing trade in wild meat across the Six Area Councils: Abaji, Kwali, Bwari, Gwagwalada, Municipal, and Kuje. To address the research question, qualitative data was collected from various stakeholder groups involved in wildlife resource utilization. These stakeholders included conservation authorities in the Federal Capital Territory (FCT), NGOs, opinion leaders, hunters, trappers, bush meat traders, farmers, and other relevant stakeholders. The qualitative data provided valuable insights into the research inquiry.

Sample size

In this study, snowball sampling was used to determine the qualitative sample sizes in areas with high activity levels. Snowball sampling entails the researcher initially identifying suitable participants and then requesting their help in identifying additional suitable participants (Ellis, 2014). The selection of study sites was based on specific criteria, including: (1) evidence of significant hunting activities; (2) accessibility; (3) limited existing studies on ethno ecology and ethno zoology in those areas; and (4) cultural diversity. These criteria guided the selection process to ensure that the chosen sites were appropriate for the research objectives and would provide valuable insights into the subject.

The identification of hunted species mentioned by the participants was conducted through various methods. These included direct observation of killed animals, capturing photographs during interviews, and using vernacular names with the help of wild scan software and taxonomists familiar with the species in the study areas. To facilitate the sample selection process, a modified random sampling technique was employed. The decision of which individuals would be selected for questionnaire administration or interviews was left to the discretion of the questionnaire administrator or interviewer. In each study area or community, target groups such as hunters/trappers, settlers, farmers, and wild meat traders were randomly chosen by field assistants, considering factors such as gender balance, community membership, and occupation. This approach ensured a representative sample for data collection.

Questionnaire/ Interview

To collect first-hand information about animal species, wild meat consumption, and market proximity, a questionnaire was used. The distribution of questionnaires followed a snowball sampling approach, targeting farmers who were familiar with fauna species and of sufficient age. After careful analysis and considering the data generation plan, 50 key stakeholders from each community were interviewed to implement the management intervention model. The study employed a combination of structured, semi-structured, and unstructured questions, along with Focus Group Interviews, to ensure a comprehensive understanding of the subject. This approach facilitated gathering diverse perspectives and allowed for a thorough exploration of the research topics, covering various aspects of interest.

Stakeholders were asked to provide estimates of their wild meat consumption frequency, showing the number of days per week, month, season, or year they typically consumed it. In order to account for seasonal variations, participants were specifically requested to estimate their wild meat consumption during periods of high and low availability. These two estimates were then combined for the analysis. To assess seasonality further, experienced hunters within the sample population were identified and queried about the months they considered having high and low availability of wild meat. The perceived availability of wild meat, rated on a scale from zero to 10 (readily available), was assessed throughout the year. Based on these responses, the duration of seasons characterized by high and low availability of wild meat was estimated. To ensure data integrity and broader acceptance, the State Director of the Environment was involved in the data collection process.

Data analysis

Quantitative data analysis was conducted using the Statistical Package for Social Sciences (SPSS), while the qualitative data analysis involved the application of a non-parametric Chi-Square test. The perceptions of stakeholders on hunting/trading, wild animal species population, and livelihood issues were assessed using the Likert scale, following the method outlined by Oppenheim (1992) and de Vaus (1998). This scale assigned weights of 5 to "strongly agree," 4 to "agree," 3 to "uncertain," 2 to "disagree," and 1 to "strongly disagree" to measure stakeholder attitudes towards statements or questions. The obtained results were computed and analysed accordingly. A comprehensive database was created, involving records of species, the number of harvested animals, along with information such as the year (s) of data collection, the duration of data collection (in months), precise geographic location, and local habitat type. The bush meat data was compared to the current conservation status of individual species using the IUCN Red List. This involved compiling all available datasets on the bush meat trade within the study areas.

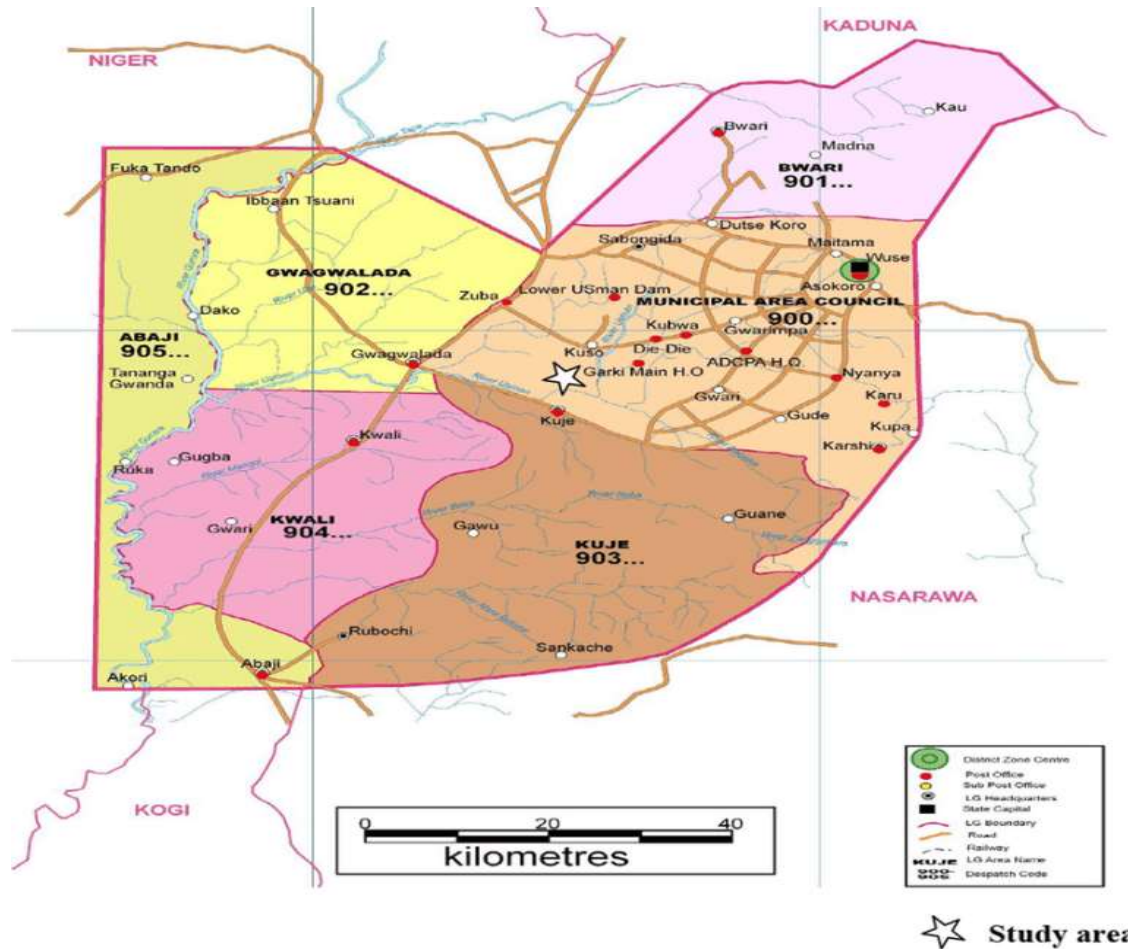


Figure 1: The Six Area Councils of the Federal Capital Territory, Abuja (Source: FCDA, 2019)

RESULTS

From (table 1), out of the fifty (50) respondents, 28 (55.6%) were males and (44.4%) females. Majority of them 42 (83.3%) were less than or equal to 35 years. The respondents were predominantly unskilled while all of them 50 (100.0%) had one form of formal education or the other. Most of the respondents 22 (44.4%) have lived more than ten years in the study place. The common savannah wild animal species sighted and hunted are mostly mammals, birds and reptiles according to (table 2). The predominant animal species listed as hunted and their status revealed that about 87% of wild animals hunted and traded in the study areas were of least concern based on International Union of Conservation of Nature and Natural Resources and 4.3% each for wild animals hunted and traded with vulnerable, near threatened and endangered

respectively. This shows that majority of these wild animals hunted and traded are of least concern in the study areas (table 2). From the methods of curbing wildlife conflicts and market distance within the communities 60% use traps followed by 28% that use firearms, 6% each uses poison and other means. Communities with distance of 1km and 3km have 22% each and followed by 4km with 16% according to (table 3). The utilization patterns of wild animals and other meats revealed that goat meat was the most preferred meat with 44% followed by cow and chicken with both 16% respectively and wild meat was 10% (table 4). Awareness of the existing law prohibiting animal hunting in the study areas. 84% were not aware while 16% were aware of the existing laws (table 6). Also, 88% are not aware of the existence of protected areas and 12% were aware. The level of awareness of the people in the study areas are very low from the findings (table 5). The report by half of the respondents 25 (50.0%) reveal that human activities was major cause for community tree reduction/depletion, followed by farming activities 17 (33.3%) were the causes of population decline in the study areas. About two thirds of the respondents prefer the use of traps as a method that could be used to solve human/wildlife conflict. Goat meat 22 (44.0%) was the most preferred meat among the respondents. Animals caught 39 (78.0%) were predominantly cooked for consumption. The respondents largely cover 1km or 3km from their respective community to the market. Most of the respondents 42 (84.0%) are not aware of any law prohibiting animal hunting. Almost 90% of them do not know of the existence of sacred grooves where hunting is prohibited. Half of the respondents 25 (50.0%) do not eat wild meat possibly due to the scarcity, cost, cultural or religious reasons. Above 80% of the respondent claim that wild meat is expensive according to (table 6). Most of the respondents agreed that the animals had depleted based on (table 7) with 60% alluding to that fact, 30% were not sure and 10% said that the population have not depleted. Migration and people that are not sure were largely considered as the main reason for dwindling in the number of games today according to the respondents with each recording 38% each. According to (table 8) 50% of the respondent agreed to the fact that is right to hunt wild animals, while 44% of the respondents do not know whether it is right to hunt wild animals or not. Majority of the respondents agree that it is right to sell or hunt wild life. One of the reason why wildlife are important show that they are food for people is a variable with the highest percentage 28 (55.5%) according to (table 9) followed by sources of income with 28% and pet 6%. The position of the people using wild animals has food will surely have a negative implications on the population of the available species in the study areas and should be addressed through the need to empower the people on domestication skills of some species of wild animals, to discourage hunting of the species in the wild, conservation education and awareness programmes should be intensified to enlighten the populace on the concepts of conservation and the reality of species extinction of some of the animals that are already threatened and endangered in the study areas and the country at large.

Table 1: Socio-demographic Characteristics of Respondents'

| Variables | Frequency (N = 50) | Proportion (%) |
|---------------------------------|--------------------|----------------|
| Age (years) | | |
| ≤ 35years | 42 | 83.3 |
| >35years | 8 | 16.7 |
| Sex | | |
| Male | 28 | 55.6 |
| Female | 22 | 44.4 |
| Duration of stay (years) | | |
| 3 | 5 | 11.1 |
| 5 | 8 | 16.7 |
| 7 | 14 | 27.8 |
| >10 | 23 | 44.4 |
| Occupation | | |
| Skilled | 14 | 27.8 |
| Semi-Skilled | 11 | 22.2 |
| Unskilled | 25 | 50.0 |
| Educational Status | | |
| Non Formal Education | 0 | 0.0 |
| Formal Education | 50 | 100.0 |

Table 2: Checklist of some wild animal hunted in the study areas.

| S/No | Common Name | Scientific Name | IUCN Conservation Status |
|------|----------------------------|---------------------------------|--------------------------|
| 1. | Olive Baboon | <i>Papio anubis</i> | Least Concern |
| 2. | Red Patas Monkey | <i>Erythrocebus patas</i> | Near Threatened |
| 3. | Warthog | <i>Phacochoerus africanus</i> | Least Concern |
| 4. | Bush buck | <i>Tragelaphus scriptus</i> | Least Concern |
| 5. | African Wild Dog | <i>Lycaon pictus</i> | Endangered |
| 6. | Cane rat | <i>Thryonomys gregorianus</i> | Least Concern |
| 7. | Hare | <i>Lepus capensis</i> | Least Concern |
| 8. | Francolin | <i>Francolins bicalcaratus</i> | Vulnerable |
| 9. | Giant Rat | <i>Cricetomys gambianus</i> | Least Concern |
| 10. | Nile Crocodile | <i>Crocodylus niloticus</i> | Least Concern |
| 11. | Monitor Lizard | <i>Varanus niloctus</i> | Least Concern |
| 12. | Lizard Buzzard | <i>Kaupifalco monogrammicus</i> | Least Concern |
| 13. | Black Kite | <i>Elanus axillaris</i> | Least Concern |
| 14. | White faced whistling Duke | <i>Dendrocygna viduata</i> | Least Concern |
| 15. | Cattle Egret | <i>Bubulcus ibis</i> | Least Concern |

| | | | |
|-----|------------------------|----------------------------------|---------------|
| 16. | Green-Backed Heron | <i>Butorides striatus</i> | Least Concern |
| 17. | African Gray Horn Bill | <i>Tockus nasutus</i> | Least Concern |
| 18. | Laughing Dove | <i>Streptopelia senegalensis</i> | Least Concern |
| 19. | Fulvous Whistling Duck | <i>Dendrocygna bicolor</i> | Least Concern |
| 20. | Senegal Coucal | <i>Centropus senegalensis</i> | Least Concern |
| 21. | Red beaked Horn Bill | <i>Tockus erythrorhynchus</i> | Least Concern |
| 22. | Red eye Dove | <i>Streptopelia semitorquata</i> | Least Concern |
| 23. | Village Weaver | <i>Ploceus cucullatus</i> | Least Concern |

Table 3: Methods of curbing wildlife conflicts and Market distance within community in the study areas

| Variable | Frequency (n) | % |
|---|---------------|------|
| Method used in solving human wildlife conflict | | |
| Use of traps | 30 | 60.0 |
| Use of poison | 3 | 6.0 |
| Use of Firearms | 14 | 28.0 |
| Do not use anything | 3 | 6.0 |
| Distance Between the Community and Market | | |
| 1km | 11 | 22.0 |
| 2km | 3 | 6.0 |
| 3km | 11 | 22.0 |
| 4km | 8 | 16.0 |
| 5km | 5 | 10.0 |
| More than 10km | 8 | 16.0 |
| Not sure | 3 | 6.0 |

Table 4: Utilization Patterns of wild animals and other meats in the study areas.

| Variable | Frequency (n) | % |
|------------------------------------|---------------|------|
| Preferred Meat | | |
| Wild meat | 5 | 10.0 |
| Goat meat | 22 | 44.0 |
| Chicken | 8 | 16.0 |
| Fish | 2 | 4.0 |
| Cow | 8 | 16.0 |
| No Response | 5 | 10.0 |
| Uses of Wild Animals Caught | | |
| Sale | 3 | 6.0 |
| Traditional healing products | 8 | 16.0 |
| Cooked for consumption | 39 | 78.0 |
| Traditional Festivals | - | - |

Table 5: Awareness of the Existence of Law Prohibiting Animal Hunting in the study areas

| Variable | Frequency (n) | % |
|--|---------------|------|
| Are you Aware of the Existence of Law Prohibiting Animal Hunting | | |
| YES | 8 | 16.0 |
| NO | 42 | 84.0 |
| Are you aware of the Existence of Sacred Grooves Where Hunting Is Prohibited? | | |
| YES | 6 | 12.0 |
| NO/ I DO NOT KNOW | 44 | 88.0 |

Table 6: Cost of wild meat and frequency of consumption by respondents in the study areas

| Variable | Frequency (n) | % |
|--|---------------|------|
| How Often Is Your Meat Consumption? | | |
| Once in a week | 3 | 6.0 |
| Once in a month | 11 | 22.0 |
| Once in a quarter | 11 | 22.0 |
| Do not eat wild meat | 25 | 50.0 |
| Is wild meat expensive? | | |
| YES | 42 | 84.0 |
| NO | 3 | 6.0 |
| I DO NOT KNOW | 5 | 10.0 |

Table 7: Respondents' Perception on wild animal population in the study areas

| Variable | Frequency (n) | % |
|---|---------------|------|
| Do you agree that wild animal population have been depleted? | | |
| YES | 30 | 60.0 |
| NO | 5 | 10.0 |
| NOT SURE | 15 | 30.0 |
| Reasons wild animal depletion | | |
| Migration from their natural habitats | 19 | 38.0 |
| Over hunting and over fishing | 9 | 18.0 |
| There are few animals in the wild | 3 | 6.0 |
| Because of Prohibition | - | - |
| Others/ not sure | 19 | 38.0 |

Table 8: Wild animal hunting and trading awareness in the study areas

| Variable | Frequency (n) | % |
|--|---------------|------|
| Is it right to hunt wild animals? | | |
| YES | 25 | 50.0 |
| NO | 3 | 6.0 |
| I DO NOT KNOW | 22 | 44.0 |
| Is it right to sell wild animals? | | |
| YES | 24 | 48.0 |
| NO | 2 | 4.0 |
| I DO NOT KNOW | 24 | 48.0 |

Table 9: Socio-economic importance of wild animal in the study areas

| Variable | Frequency (n) | % |
|-----------------------------------|---------------|------|
| 1. Food | 28 | 56.0 |
| 2. Pet | 3 | 6.0 |
| 3. Sources of income | 14 | 28.0 |
| 4. Medicinal purposes | - | - |
| 5. I do not know | 5 | 10 |
| 6. Other importance not mentioned | - | - |

DISCUSSION

Most respondents in this study were males and in their active age group, with a significant proportion having approximately ten years of residency in their respective localities. This finding aligns with previous research conducted by Ajayi *et al.* (2021), Halidu *et al.* (2021), Ojo *et al.* (2019), Orimaye *et al.* (2018), and Oyegbami *et al.* (2017), which also observed that individuals in this age range were primarily involved in hunting expeditions, trading, and other activities related to the utilization of wild animals in various locations across Nigeria. This shows that there is an active population that engaged in economic pursuits that poses a threat to wildlife conservation. The commonly encountered and exploited wild animal species in the savannah region were predominantly mammals (primates, carnivores, and herbivores), along with a variety of bird species and reptiles.

A study conducted by Okigbo (1985) examined the relationship between land use and productive potentials of the African savanna. The findings revealed that abundant animal populations in this region can be attributed to specialized adaptations associated with different vegetation types, food preferences, variations in grazing heights, utilization of different dry season refuges, and the ability to exploit the same food source at different times. Another study by Irene *et al.* (2021) investigated changes in vegetation cover across Nigerian states and geopolitical zones. The North Central geographical zones displayed significantly higher percentage tree cover in Plateau state, followed by Niger state and the Federal Capital Territory (FCT), Abuja. These favourable conditions contribute to the thriving populations of birds, reptiles, and mammals, as the vegetation serves as a vital source of food, cover, and shelter for these species.

Regarding the assessment of animal species hunted in the study areas, majority of the respondents expressed uncertainty about the status, while a smaller proportion reported that the animals are commonly found in those areas. Previous studies conducted by Babagana *et al.*

(2012), Uloko and Yager (2017), and Yager (2021) have highlighted the adverse impact of human activities, particularly hunting and agricultural expansion, on the decline of fauna populations in the country. The implications of these findings concern, as if this trend continues unchecked, it could cause extirpation and eventual extinction of many endemic wild animal species in that region of our nation. The utilization patterns of wild animals with other conventional meat in the study areas revealed that ten percent of the respondents utilized the wild animals. According to Anayo, (2022) that urban centres grow in demand for bush meat. Cities such as Lagos, Port Harcourt and Abuja often gotten animals such as pangolins, grass cutters etc. The report by Wild Aid, referenced by Anayo, (2022), conducted in Lagos, Calabar, Abuja and Port Harcourt revealed that 71 percent of 2,000 participants has consumed bush meat at some point in their lives and 45 percent had consumed it within the last year. More so, 78% of wild animals hunted in the study areas were cooked for food. This is in agreement with report by Wild Aid, referenced by Anayo, (2022), than 50 percent of people who consume bush meat in the year 2022 do so because of the special taste while 30 percent said it was part of their culture and 25 percent said that it was healthier and fresher than regular meat and fish. Wildlife contact with people and domesticated animals greatly increase the risks of introduction and transmission of new diseases through contact with infected species. This trade remains largely unregulated, unhygienic and stressful. According to World Health Organization, reference by Adepoju, (2023), seventy-five percent of all emerging infectious diseases in the last decade have originated in animals such as Ebola, HIV, SARS and COVID-19 have been linked to the wild or bush meat trade.

Forty eight percent of the respondents affirmed that it is right to sell wild animals. According to Anayo, (2022), Nigeria has a flourishing bush meat markets in major cities selling both legal and illegal bush meat. Fifty six percent of the respondents uses wildlife for food and twenty eight percent as a sources of income. This is in agreement with the report of Ajayi, *et al.*, (2022) that income generation and food were the major reasons for hunting in Owotoro community, Oyo State, Nigeria.

CONCLUSION AND RECOMMENDATIONS

The present study assessed the hunting and trading of wild animals, as well as their significance in the six area councils of the Federal Capital Territory (FCT), highlighting the implications for conservation and sustainability. The findings show that the hunting and trading of wild animals are primarily carried out by young males, often lacking skills and possessing minimal awareness regarding conservation practices. A significant number of individuals were unaware that the hunting, trading, and consumption of many wild animals are prohibited by law. Mammals, birds, and reptiles were the most commonly hunted and traded vertebrate classes, often using traps. The primary value attributed to wild animals was their use as food, with most respondents

acknowledging the high cost of meat in the areas. It is recommended to raise public awareness about the preservation, conservation, and intrinsic values of wild animals for the sake of future generations.

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