A SURVEY OF WILDLIFE RESOURCES UTILIZATION IN TARABA STATE, NIGERIA

RIKWENTISHE, FINCHI

(M.TECH/FR/07/0403)

AUGUST, 2011

A SURVEY OF WILDLIFE RESOURCES UTILIZATION IN TARABA STATE, NIGERIA

BY

RIKWENTISHE, FINCHI

(M.TECH/FR/07/0403)

A THESIS SUBMITTED TO THE POSTGRADUATE SCHOOL, FEDERAL UNIVERSITY OF TECHNOLOGY, YOLA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF TECHNOLOGY IN WILDLIFE CONSERVATION AND MANAGEMENT OF THE DEPARTMENT OF FORESTRY AND WILDLIFE MANAGEMENT, SCHOOL OF AGRICULTURE AND AGRICULTURAL TECHNOLOGY.

AUGUST, 2011

DECLARATION

I hereby declare that this thesis was written by me and it is a record of my own research work. It has not been presented before in any previous application for a higher degree. All references cited have been duly acknowledged.

…… …….

RIKWENTISHE, FINCHI DATE

(PG/07/0403)

DEDICATION

I dedicate this project to my late beloved grandparents, Mr. and Mrs. Rikwentishe Apwere and Amina Rikwentishe.

APPROVAL PAGE

This Thesis entitled "A Survey of Wildlife Resources Utilization in Taraba State, Nigeria" meets the regulations governing the award of Masters Degree of the Federal University of Technology, Yola and is approved for its contribution to knowledge and literary presentation.

_____ _____

Supervisor (Name and Signature) Date

_____ _____

Internal Examiner (Name and Signature) Date

_____ _____

External Examiner (Name, Address and Signature) Date

_____ _____

The Head of Department (Name and Signature) Date

_____ _____

Dean, Postgraduate School Date

ACKNOWLEDGEMENT

I am grateful to my Almighty God for given me the life to live, the strength to work, the guidance to follow the right path, and the understanding to do my best throughout the study.

My greatest debt of gratitude is owed to my project Supervisor, Professor Callistus Akosim, who patiently read and guided my project to its successful conclusion despite his tight scheduled of duties. I also appreciate the assistance offered to me academically and in other areas by the following: Prof. Arifalo E. I., and Prof. Kadams for their keen interest on me since the beginning of my study in Federal University of Technology, Yola.

I would like to also express my sincere gratitude to Dr. M. Akpan, the Head of Department of Forestry and Wildlife Management for his fatherly advice and encouragement throughout the period of my programme. However, I recognized the efforts of all lecturers in the Department and in the entire school of Agriculture and Agricultural Technology.

My profound gratitude goes to my Parents Mr. and Mrs. Hon Elisha Rikwentishe, for their kindness in sponsoring my education.

It is my pleasure to acknowledge those who criticized the thesis and made objective comments especially my colleagues.

There are many whose contributions have helped in the success of this project but whose names have not been mentioned here. I appreciate your efforts.

Finally, I am most indebted to my dear wife, Mrs. Juliana Rikwentishe, whose tremendous contribution can not be quantified. God bless you all.

ABSTRACT

This study investigated the wildlife resources utilized, the pattern and level of utilization, factors affecting utilization and the attitude of respondents toward wildlife resources utilization in Taraba State. Structured questionnaires were administered on 337 respondents, using multi-stage and simple random sampling in the study area. Results obtained indicated that 31 species of wild animals made up of 4 avian species, 5 reptilian species and 22 mammalian species were utilized in the study area. 70.35% of the respondents accepted bushmeat as food. 89.86% of the respondents preferred bushmeat to domestic animals' meat. 48.59%, 27.10%, 12.46%, 7.16% and 4.67% of the respondents utilized wildlife resources for food, medicine, metaphysics, decoration and others respectively. 91.00% of the respondents utilized wildlife resources for various purposes. The parts of wildlife species utilized included carcass (44.65%), skin (23.27%), horn (10.06%), dung (9.43%), skeleton (8.80%) and hair (3.77%). Age, occupation, religion, income level and educational level, significantly ($P < 0.05$) affected wildlife utilization in the study area. 73.39% of the respondents did not support indiscriminate exploitation of wildlife resources in the study area. In view of high acceptability of bushmeat as food and the high level of utilization of wildlife resources for various purposes, it is recommended that government should encourage the people in the study area to embark on wildlife farming/captive breeding and game ranching. This will stem the pressure on wildlife resources in the wild and guarantee sustainable utilization.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the Study

The benefits from a nation's wildlife depend first and foremost on government policy. It also depends on public knowledge about how best to cope with wildlife development and management or administrative problems in a diverse forest land (Rikwentishe, 1999). He further observed that the benefits of planned forest management and planned implementations of wildlife development are countless and include social, economical, cultural and traditional benefits. Adeyoju (1975) observed that wildlife can perpetually continue to provide numerous benefits if only, man would be kind to it by using it wisely internationally, locally and helping in its conservation.

However, the utilization of wildlife resources in Nigeria cannot be under estimated because the term bush meat is used to describe the flesh of wild animals in West Africa and it constitutes a large proportion of the animal protein consumed by the rural communities (Ayeni *et al.*, 1982). Although the contribution of bush meat to Nigerians' diet is substantial, it is higher in other West African countries such as Cameroon, Ghana and Liberia where bush meat constitutes about 70-90% of their protein intake (Martins, 1991). Many recent surveys on the frequency of bush meat or wild meat consumption have shown that both rural and urban

communities now eat bush-meat. This is contrary to what was obtained about three decades ago when bushmeat was mainly the food of rural communities (Kwaga, 1999).

Furthermore, survey studies carried out in Adamawa State indicated that wild animals play vital roles in the life of various people in Nigeria. For example wild animals in Nigeria have been found to be very useful in other areas such as medicine, economic, culture, ornamental and ecological stability (Akosim and Mamman, 2000).

In Nigeria wildlife is typically viewed as bush meat. Bush meat is popular with both urban and city dwellers and provides 20% of animal protein in southern Nigeria, and the most commonly consumed species are small mammals including squirrels, grass cutters, giant rats, tailed porcupines and bats (Ajayi, 1997). An estimated total of 1,320,000 metric tones of bush meat were hunted by farmers in three ecological zones of Nigeria within a six month period (Adeola and Decker, 1987)

Apart from bush meat, wild animals contribute to local economy through their by-products such as skins, hides, bones, shells and horns. However, accurate information on income accuring to local communities from the marketing of such products is not available for any African country. Some wild animal species may be more valuable for their trophies (e.g. elephant's and rhinos) or for their skins

(e.g. Carnivores and reptiles). Some of these trophies (e.g. ivory and rhino horn) have intrinsic value and people will continue to choose such items and pay high prices for ornaments made from them even when there are substitutes. The value of ivory rose from $5 per kg in the 1960s to $70 in the mid-1970s and further to $150 in early 1980s (UNEP, 1989). With this high increase in price, ivory became a form of currency by which rich businessmen exported money out of Africa. The drastic decline in elephant populations has been attributed mainly to poaching and illegal ivory trade. Until the ban on international trade in African ivory, the bulk of ivory from the continent was supplied by Zaire, Kenya, Uganda, Tanzania, Sudan, Congo and South Africa (FAO, 1979).

Hides and skins may be used locally for the manufacture of items of clothing such as shoes, bags, belts and hats or may be transported for sale in city markets or exported for the manufacture of more sophisticated leather products. Python and crocodile skins are valuable commodities used for the production of fancy and high quality leather goods. Local craftsmen use bones and horns of wild animals for the manufacture of various artifacts which are sold to supplement household income (Redford and Robinson 1991).

Sustainable use can be defined as the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential, to meet the needs and

aspirations of present and future generation (FAO, 1991). Populations of animal species usually fluctuate naturally over time depending on many environmental factors. However habitat quality and predation (including hunting) are two of the most important factors that determine population densities. The combination of increased hunting pressure and the loss of habitats' quality triggered the decline of many wildlife species especially larger species with specific habitat requirements and low reproductive rate.

Sustainable harvests should not be greater than production, and populations should not be reduced to densities whereby they can no longer fulfil their ecological role. For example, pollinators, seed dispersers, predators and browsers should be harvested sustainably (FAO, 1991). However, in practices it can be very difficult to properly assess population densities and annual production, especially in closed forest ecosystems. Similarly establishing the specific ecological role of all species are an equally difficult task. One should therefore be cautious about assuming ecological roles as our understanding of this complex interaction is highly limited (Hussain, 1997).

1.2 Statement of the Problem

Although earlier studies have shown that wildlife and its products are utilized in the state (Taraba), none has shown in detail the pattern and level of utilization in both urban and rural centers of the state. This dearth of information

makes it difficult to develop a standard beneficial wildlife management programme that will satisfy the need and pattern of utilization of wildlife and its products in the entire state while at the same time ensuring a continuous abundance of wildlife species for sustainable utilization.

1.3 Objectives of the Study

The objectives of the study are to:

1. Identify the wildlife species that are utilized in Taraba state, Nigeria.
2. Assess the pattern and level of utilization of wildlife resources in the study area.
3. Examine the perceptions of the respondents towards wildlife resources utilization.
4. Investigate the factors influencing the people's attitude towards wildlife resources utilization in the study area.
5. Investigate the attitude of the respondents towards wildlife conservation.

1.4 Justification

This study is expected to generate information necessary for proper planning of wildlife resources utilization on sustainable basis in Taraba State, Nigeria.

1.5 Limitations of the Study

The only limitations to the study were:

Logistics, Lack of proper identification and description of some wildlife species by the local people, Fear of reprimand by law enforcement agents on wildlife utilization, particularly where the law is against possession of wildlife trophies.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 The Significance of Wildlife as a Source of Bushmeat

Wildlife is important to the national economy both as a source of meat and as the basis for tourism and recreation. However, its role as a source of meat has made more impact among the Nigeria populace than its role as a source of tourism and recreation. Wild animal meat is the main source of cheap protein for the majority of rural communities in Nigeria (Eltringhan, 1984). About 80% of the population in Nigeria are rural dwellers who depend on bushmeat for protein need. With this observation, one can therefore, appreciate the significant contribution of bush meat to the national economy and in reducing the protein deficiency of rural dwellers. Among fishing communities located along riverine and coastal areas, fish and non-fish aquatic vertebrates such as crocodiles, terrapins, hippopotamus and manatee are the main source of bush meat. Charter (1970) estimated that between 1965 – 1966 a total of 617.00 tons of bush meat were consumed by communities located along reverine and coastal areas. The bulk of this was from mammals and reptilian species associated with aquatic systems. The Isoko tribe, a rural coastal community in Delta State whose water bodies are rich in manatees, consumed 20g of bush meat per person daily (Nicol,1953). Olayide (1981) estimated that the per

capital consumption of bush meat per day for the whole country was 22.02g which is the equivalent of 3.86g of animal protein per day (Ayeni, 1988).

A survey of West Africa countries (Ajayi, 1979) revealed that the average consumption of bush meat in rural areas is between 20 and 90% of total animal protein intake. Thus wildlife as a source of meat contributes significantly to the national food budget of rural dwellers. These figures are either unreported or are far higher than those recorded by the federal office for national statistics. The lack of information is also partly responsible for the non-recognition of this sector of the economy and the poor financial support being made for wildlife budget.

Bushmeat was one of the main sources of food and virtually the sole source of animal protein for people of west Africa in pre-historic times (Adebayo, 1970). Civilization and agricultural development over millennia has drastically reduced people's dependence on bush-meat as a source of food in many parts of the world (FAO, 1991). In Africa, however, bush-meat continues to contribute substantially to the total animal protein supply. In countries such as Botswana and Zaire much of the meat consumed is bushmeat and in the majority of West African States (FAO, 1991). Bush-meat is the preferred meat and has a higher retail value than domestic meat in urban markets. In addition to being a highly preferred food item in many areas of Africa, wild animal foods are life saving reserves in times of food shortage and hunger. The importance of caterpillars, beetles and termites as key

sources of food in times of famine is particularly well documented for communities in the Central African Sub-region (Wilson, 1990).

The magnitude of exploitation and consumption of bush-meat however, varies from country to country and determined primarily by its availability but is also influenced by government controls on hunting, socio-economic status and cultural prohibitions. In areas where wildlife still exist, people collect, hunt or purchase and eat bushmeat for a variety of reasons. Some people depend on bush meat for their animal protein supply because they have no other source or cannot afford alternative sources; others eat bush meat as a matter of preference or as a luxury item or delicacy to be eaten on special occasions. For the former groups, all species of wild animals are accepted while the latter group will go to great lengths and are willing to pay high prices for their choice species (Hussain, 1997). He also observed that the reality in Africa is that for the greater majority of rural people, bushmeat represents a vital dietary item for a complex combination of reasons dictated by lack of alternate sources, financial limitations, preference and cultural values . Wild animals constitute a valuable food source which cannot be easily withdrawn or replaced without causing wide-ranging socio-economic imbalances (FAO, 1991).

2.2 Utilization of Wildlife Resources

2.2.1 ***Food from the Wild:*** According to Brain (1992), information on wildlife consumption is sparse and typically non-quantitative, because of the nature of the consumption, which is generally on a subsistence basis and therefore unrecorded by the normal accounting processes. Estimated figures vary widely and are often contradictory. In Adamawa State, wild animals are mainly hunted for food. A large proportion of the animal protein consumed by the rural communities in the State comes from the wild animals (Akosim and Mamman, 2000).

Redford and Robinson (1991) stated that many different species of wild animals are exploited as sources of food, providing a variety of dietary essentials such as protein, fats and oils. The most conspicuous terrestrial source of wild animal protein is medium and large mammals. It was reported that subsistence hunters take more mammals than birds and more birds than reptiles. Also, that bird generally provides meat and eggs for human consumption. Among reptiles, the monitor lizards are widely eaten in Africa. Iguanas in South America and the sea turtles particularly the green turtles (*Chelona myda),* provide meat for many littoral people world wide (Redford and Robinson, 1991).

Food and Agricultural Organization (FAO, 1979), reported that wild animals are important sources of animal protein to the people of Africa, especially those in rural areas. Ajayi (1979) also described the term “bushmeat” as the flesh of wild

animals in West Africa and that it constitutes a large proportion of the animal protein consumed by the rural communities of the tropics. Though the contribution of bush meat to Nigerian diet is substantial, it is higher in other West African countries such as Cameroun, Liberia and Ghana, where bush meat constitute 70-90% of the meat taken (Martins, 1991). He also reported that over 90% of Nigerians interviewed (in the South) claimed to have eaten bushmeat. He further observed that survey on the frequency of bushmeat consumption showed that both rural and urban communities eat bushmeat. According to Adeola and Decker (1987), bushmeat is popular with both urban and rural dwellers and it provides 20% of animal protein in Southern Nigeria. The most commonly consumed species are small mammals including squirrels, grass cutters and giant rats. A survey study conducted in the Northern part of Adamawa indicated that about 80% of the respondents accepted bushmeat for food (Kwaga, 1999).

2.2.2 Utilitarian Uses

Hemley (1988) reported that in addition to its nutritional values, wildlife resources may provide important utilitarian products for both domestic and commercial markets. He further stressed that fur, skins, scales, bones, and feathers may be used to make a variety of clothing materials and utensils, while fat may be used for oil. Needles and hooks are made from bones, scales and fins.

2.2.3 Ornamental Uses

Wildlife products are valued for their ornamental, decorative or ceremonial purposes (Akosim and Mamman, 2000). Elephant Ivory, Tortoise shell and furs have been much prized in international trade for many centuries and are presently prohibited from international trades by CITES (Brown, 1989). The production of reptile leather has risen in importance and demand because of their use in the manufacture of shoes and fancy goods (Hemley, 1988). It was reported by Akosim and Mamman (2000) that the tusk of Elephants and Hippopotamus and the feathers of ostrich are used as ornaments in Adamawa State, while the skin of leopard, hyena, python and crocodile are used for bags, shoes, purse and for clothing. They also mentioned that warriors in many parts of the state are often seen wearing animal skins especially during annual celebrations. Also, some of the by-products are used in the installation of traditional rulers in many parts of the state.

2.2.4 Medicinal and Biomedical Uses

Wild animal products are widely used in medicines by traditional societies and some urbanized societies still keep faith with traditional animal-based remedies (Luxmore, 1989). He further observed that 181 animal based remedies are used by the Hausa tribe in Niger Republic, most of which were derived from wild animals. Redford and Robinson (1991) also reported that medicinal wildlife products are frequently traded internationally particularly to satisfy the demand for

traditional oriental medicine and that some products are so valuable that the trade can continue even when the species become extremely rare in the wild and in such cases, it may pose a severe threat to their survival.

In Adamawa state, wildlife products are highly valuable in traditional medicine and the parts of the animals involved are bone, heart, tusks, skin, horn, tail, nose, feather hirer, intestine, skull, teeth, urine and beak. The various parts are used in preparing concoctions for curing ailments and for protection against enemies and witches (Akosim and Mamman, 2000). Substances with great potentials used in medicine have also been isolated from snake venoms, these include coagulating enzymes, anticoagulants and neurotoxins (Barton, 1986).

2.2.5 Beast of burden/sport hunting

It is a known fact that some wildlife species are domesticated and used for various purposes such as carrying of goods and human beings from place to place as well as ploughing the soil and for planting of crops. The commonly used animals are donkeys and camels (Akosim and Mamman, 2000). According to Barton (1986), trained wild animals are widely used in sport hunting. For example the sport of using falcons, hawks and sometimes eagles to capture and kill wild game. Bubenik (1989) also observed that in many societies, animals are hunted for pleasure and in affluent societies, private individuals may pay huge sums of money for the privilege. He also mentioned that some governments raise significant

revenues both for their central and local treasuries through controlled system of hunting licenses or permit sold out. Some African countries are able to sell the right to shoot animals on their land to visitors, a situation which considerably enhanced the economic values of wildlife (Anstey, 1991).

2.2.6 Recreation, Tourism and Aesthetic Uses:

Wildlife also has enormous recreational and aesthetic value because many people derive pleasure from wildlife either by observing them in the course of their daily lives, by making special excursion to view them or by simply knowing that they are existing (Redfort and Robinson, 1991). They went further to state that this non-consumptive use is very difficult to evaluate in monetary terms, but that they may be the greatest economic value of wildlife. In Kenya the African Elephant was estimated to worth millions of dollars a year to the tourist industry (Brown, 1989). Thus it is primarily the wildlife which draws people to places such as the East and South Africa (Auzel And Wikie 2002). Vedder and Weber (1990) observed that in the developing countries(Nigeria inclusive), oversea tourists bring much needed foreign exchange, for example, they can pay up to $200 per person to spend an hour with wild animals, most especially with the habituated mountain Gorilla.

2.2.7 Research and Educational Values

The very existence of man depends on the natural environment and its sustaining process of which wildlife resources are an integral part. Wildlife is important in medical research especially in the area of drug testing and vaccine production (Ayodele *et al*., 1999). They further mentioned that most institutional zoos like the University of Ibadan zoo serve as out door laboratories for animal studies, most especially in aspect of anatomy, pathology and reproduction. The zoo also serves as natural resources conservation centers (Bennett, 2002).

Alo *et al*., (1997) reported that conservation areas serve as educational tools in the following ways: creating awareness on the values of wildlife resources among the populations; training of manpower in wildlife management and conservation and convincing people on the need to support government's effort in wildlife conservation programmes.

2.2.8 Economic Values:

In Nigeria, many species are traded in local markets providing direct revenue for hunters and traders alike (Colyn and Mbaele, 1988). They also reported that the hunters take the higher value carcasses especially duikers to the town for sale, while the rodents and other smaller animals are mostly consumed by the hunters and their families. Kwaga (1999) reported that bushmeat is highly priced in Adamawa State. A survey conducted showed that the meat of wild

animals is more highly priced than those of their domestic relatives. The study indicated that 1 kg of bush meat cost between N122 to N155 while that of domestic meat cost between

N87.50 kobo to N100.00. He further reported that income realized by a hunter per annum in the state ranges from N54, 000.00 to N81, 000.00. Ayeni *et al*., (1982) observed that it is important to examine the economic feasibility of wildlife and to determine the overall contributions (tangible and intangible benefits) of wildlife to the national economy. If the wildlife potentials of the nation are totally and properly mobilized, the income of the country can be substantially boosted.

2.3 CONSERVATION OF WILDLIFE RESOURCES

Nigeria, the most populous black African country with an area of 923,773 square kilometres, is blessed with abundant natural resources of which wildlife species are very prominent. It is pertinent to note that only 9.8% of her total land area is under conservation out of which game reserves and national parks form about 3% (Ayeni *et al*., 1982). The Nigeria's present game reserves were originally forest reserves, established by the colonialists (Afolayan and Ajayi, 1983). They further reported that, unlike the situation in East Africa the British administration in Nigeria paid very little attention to wildlife conservation. In East Africa, better attention was given to the conservation of wildlife resources. Ijomah and Akosim (2000) reported that conservation of every renewable natural resource is important for a

healthy and balanced ecosystem and helps in the protection of the environment and control of environmental degradation through pollution control. Wildlife conservation through the use of game reserves and national parks is a form of land-use requiring large areas of land in which animal and plant diversity are usually high (Alo *et al*., 1997). They cited Lekki Conservation Centre Project as an example of protected areas that conserve biodiversity and prevent environmental degradation.

Optimization of Conservation of Wildlife resources can be carried out in the following ways:

1. Enlightenment Campaigns and Education

Awareness of the public for the need to conserve wildlife resources can be created through the use of media agencies. In the process, direct campaign is launched against illegal and indiscriminate exploitation of wildlife resources (Ijomah and Akosim, 2000).

2. Establishment of In-Situ Conservation Areas

In-Situ conservation involves the use of National Parks, nature reserves and Game Reserves for the conservation of plants, animals, soil, watershed, historical monuments, aquatic bodies (e.g. lakes, falls), etc. Such conservation areas are established by law and can be used to conserve endangered, rare and common

species in their natural habitat or environment. Ex-situ conservation areas include Zoological and botanical gardens and arboreta. They are used for protection and preservation, and rearing of animals and growing of plants. Animal facing extinction are kept and reared in zoos where possible, while endangered plants are grown in botanical gardens and arboreta. These animals and plants could be reintroduced into the wild for stocking purpose. Zoos and botanical gardens are also for conservation, education and tourism and could therefore be used to weep up sentiments in favour of conservation of wildlife resources (Ijomah and Akosim., 2000).

3. Through The Use of Appropriate Land-Use Policies

Rational land use policies are formulated taking into consideration the protection of soil, water resources and general ecological balance. Besides, the policies must also integrate conservation with national economic development policies (Ijomah and Akosim, 2000).

4. By Creating Gainful Employment Opportunities for people

Indiscriminate utilization of wildlife resources, especially for economic reasons are reduced if not completely checked through the creation of alternative and gainful employment particularly for those living close to conservation areas (Ijomah and Akosim, 2000).

5. Involvement of the people in Conservation Programmes

Involvement of the local people particularly those living close to the conservation areas guarantees the success of the conservation projects and programmes. When the local people are not involved their actions tend to conflict with the goals of the conservation programme (Ijomah and Akosim, 2000).

6. Through The Use of Laws

Laws are used to establish in-situ conservation areas such as National Parks and Game Reserves. They are also used to control indiscriminate use and destruction of habitats and ecosystems as well as wildlife resources therein. The law prescribes punishment for defaulters and therefore helps to check abuses (Ijomah and Akosim, 2000).

7. Establishment of Monitoring Agencies

Monitoring agencies may be governmental or non-governmental. Their functions are to implement and supervise all the national conservation strategies as well as to monitor and evaluate the status of natural resources from time to time and assist in policy formulation (Ijomah and Akosim, 2000).

8. Through The Involvement of Public Liability Companies and Corporations

Public liability companies and corporations have a role to play in wildlife

resources conservation as is the case in other countries particularly in Europe. In these countries, public companies and corporations are by law expected to use a percentage of their profit to support and promote conservation projects and institutions. In some countries they are made to pay certain percentage of their profit (about 0.15%) into a special account devoted to the conservation of wildlife resources.

In Nigeria such companies should include: Banks, manufacturing houses, construction companies, airlines, etc. An enabling legislation is therefore expedient in this regard, and to ensure that the policy succeeds in Nigeria, the eligible companies and corporations should be made to pay certain percentage of their profit into an account to be controlled by a committee set up by the Federal Government.

The fund realized will be used to sponsor research work in major conservation areas, breeding of endangered species for the purpose of reintroduction, educational campaigns for the conservation of wildlife resources, etc (Ijomah and Akosim, 2000).

9. Organization and Administration of Conservation of Wildlife Resources

The organization and administration of conservation programmes, particularly for wildlife resources have always met with serious difficulties

especially in the area of grass-root participation. The omission of the people at the grass-root is the major cause of the failure of most conservation programmes.

It has been stressed by many eminent conservationists, that the extent of success achieved in any conservation programme depends on the degree of the involvement of the local people who live closest to the natural resources (Ijomah and Akosim, 2000).

Furthermore, MC Graw-Hill Encyclopedia of Science Technology (1960) listed new approaches for wildlife conservation, which include intensive study and research by expert to isolate problems, definition of goals, education of the public (and specialized through the media), programmes for habitat conservation, Goal oriented game harvest, regulation of populations and control programmes. Beside, manipulation of sex and age ratio as well as control of density of animals, to achieve desire population change, action by agent to deter or apprehend poachers or game law violators and control of diseases and parasites and of select individual predators and indeed of utmost importance is monitoring of the parks for activities such illegal poaching and grazing.

2.4 WILDLIFE DOMESTICATION.

Domestication encourages conservation because when animals which are highly accepted by the people as meat are domesticated and the people can now rear them as domestic livestock, pressure on wild ones by way of hunting will be reduced

(Ajayi, 1974). He further said that it will also enable the people to have the meat at will and to guard game animals as jealously as their livestock and their extinction will become a concern to everyone. According to Adeola and Decker (1987) in the West African sub region, the tradition of bush meat consumption is firmly establish and bush meat is the favourite meat of a large number of people. Prices of bush meat are known to be higher than domestic meat in most areas, and the indications are that there is an unlimited market for the product. They therefore confirmed that under these circumstances, managing small, prolific wild animal species for meat production purposes offer high prospects.

2.5 FACTORS AFFECTING WILDLIFE CONSERVATION PROGRAMMES

Socio-economic and cultural Factors: Akosim., (1997) reported that in some parts of Nigeria, wild animals are regarded only in terms of their characters as dangerous, inconvenient, or edible and need only to be destroyed or eaten. Such tradition does not encourage conservation. Such social and cultural factors include status, settlement patterns, occupation, population, education, religion, customs, as well as traditions (Gawaisa, 2001). He suggested the ways to combat socio-economic and cultural problems of' the people, which include education and enlightenment campaigns, poverty alleviation, population growth, control provision of infrastructural facilities to those living close to conservation areas and

involving the local people in conservation programmes. Ajayi., (1990) suggested that alternative jobs and employment opportunities should be created for wildlife poachers.

Ecological factors: the number of tropical forest animals that can be harvested sustainably is limited in the first place by their biological supply (production). Hunting in tropical forests with low animal production (e.g., monodominant forests, upland Amazonian terra firm forests) is less likely to be sustainable than more productive landscapes (e.g. forest-savanna mosaics or fruit rich forests).

Although biophysical variation between tropical forested sites is large and more data is needed, current best estimates suggest that on average, they produce about 150 kg of vertebrate biomass per year. Yet Anstey (1991) observed that annual hunting rates can be substantially higher than productivity in these same forests, with values ranging from 200 kg/km2 up to 700 kg/ km2 across several locations. Decrease in forest area, through deforestation, unsustainable logging and land use change for examples, contribute to a loss of habitant for typical forest species. However, the mixed agricultural/forest landscapes that is created through the above activities usually favours a number of other wildlife species. Some vertebrate species that thrive in fallow vegetation and/or agricultural mosaics are known to be resilient to hunting pressure and are favoured game (Anstey, 1991).

Demographic factors: Increases in human population density generally lead to increased pressure on bushmeat resources. It is estimated that for people who depend solely on bushmeat, human population densities should not exceed one person per km2 (Redford and Robinson 1991). Actual human densities in tropical forests where hunting is considered sustainable are much lower. Furthermore, these people live largely outside a market economy, and tend to exclude others from their hunting areas (e.g. Ache, in Paraguay). An important pressure on wildlife in 'frontier forests' comes from local communities (including new settlement and increased sedentarism of indigenous forest dwellers), with usually a high proportion of the population hardly involved in the traditional economy.

Technological factors: Changes in traditional hunting practices through the use of improved hunting technology (e.g. shotguns, flashlights, outboard motors) generally decrease the probability that hunting will be sustainable since both the range of species taken, the area hunted and fatal injury rates increase. In addition, the uses of steel wire snares, for any species, also increase rates of indiscriminate harvest (Auzel and Wikie., 2000).

Infrastructural development/Economic consideration: Most of the remaining, relatively undisturbed forest areas can be considered as "frontier zones", with usually a low forest land value and more or less open access. Roads, railways, and

other transport infrastructure help to open up few frontier areas; they contribute to habitat loss and to the fragmentation of habitant as well as promote increased immigration and settlement in new, formerly undisturbed areas. This improved access increases the hunting pressure and facilitates the transport of bushmeat to markets. Declines in world prices for some agricultural crops have driven many farmers to seek alternative sources of income, and many have "become part-time or full-time hunters. However, the factors that determine whether a household farms or hunts are complex. For example, bushmeat hunting is likely to be more profitable than farming in enclave areas without easy access to roads; as the price to weight ratio of bushmeat is typically higher than any other agricultural crop, and only small quantities of goods can be transported on foot to markets (Asibey and Child., 2008).

Institutional and governance factors: Lack of adequate attention to the role of bushmeat by development agencies, Non Governmental organization (NGOs), and national governments contribute to the unsustainable hunting of bushmeat in tropical forests. Even when present at national level, policy and legal frame works to promote sustainable use of natural resources are seldom adequate in remote areas. Financial, material, and training resources are insufficient to allow law enforcement personnel to adequately address the illegal commercial trade in bushmeat, and this deficiency decreases the capacity for control of activities. Loss

of birth and traditional hunting territories (e.g. those belonging to certain traditional groups) and methods (e.g. hunting zone rotations) allow open access to the resource and concentration of hunting, thereby resulting in loss of sustainability (Auzel and Wikie., 2000).

CHAPTER THREE

Materials and Methods

3.1 The Study Area

Taraba State was created on August 27th, 1991, when the Babangida military administration carved it out of the defunct Gongola State. The state derives its name from one of the three major rivers and it covers a land area of 59,400square kilometres. At inception, the state was comprised of only eleven local government areas namely: Jalingo, Donga, Zing, Lau, Karim Lamido, Sardauna, Bali, Gashaka, Wukari and Takum. The state currently has 16 local government areas as a result of the creation of the following new local government areas: Ibbi, Yorro, Ardo-kola, Kurmi, Ussa and Gassol in 1996. There is also Yangtu, a special development area created by Danbaba administration in 2008 (Taraba Diary, 2010)

3.2 Location

Taraba state lies roughly between latitude 6o:30' and 9o:36' North and longitude 90:10' East .It is bounded by Bauchi and Gombe States in the North-East, Adamawa State on the East and by Plateau in the North-west. The State is further bounded to the West by both Nasarawa and Benue States while it shares an

international boundary with the Republic of Cameroon to the South and South-east (Taraba State Dairy, 2010) (Figure 1 and 2)

Map

MAP

3.3 Topography

Extensive mountainous areas are found in the state, which form part of the eastern highland of Nigeria. Altitude range from 350m to over 2,400m above sea level, giving rise to steep slope, deep plunging valleys, precipitation escarpment and swiftly flowing rivers. The highest mountain in Nigeria, Chappal Waddi (a Fulani term meaning mountain of death), with the height of 2,647m above sea level is located in the central part of the State adjoining a Nigerian-Cameroon border. The rugged terrain work to the advantage of conservation effort in the State (Dunn, 1993).

3.4 Drainage

Taraba State is drained by many rivers; major of all are Taraba, Mayo Yim, Mayo Yadaso, Mayo Gumti, Tati and ChangChanji rivers. They have their head water in the mountains, and are important tributaries of the river Benue (Dunn, 1993).

3.5 Geology and Soil

The State consists of the lower palaeozoic to precambia basement complex, overlain at least in part by more recent volcanic rock. Soils of the state have not been systematically examined but by analogy with adjacent areas, humic ferrisols

and lothosols are likely to occur at higher altitude. Ferruginous tropical soil on crystalline acid rocks is found at lower elevation and alluvial soil in broad river valleys (Dunn, 1993).

3.6 Climate and Season

Taraba State climate is broadly characteristics of the Guinea Savannah Zone. Typically the rainy season begins in March or early April and ends in mid November. Rainfall range from 1,200mm in the North to nearly 3,000mm in the South of the State. (Akosim and Buba, 2007). Minimum Temperature range from 16^{o}C to 24^{o}C in the month of December and January while maximum temperature range from 28^{o}C to 35^{o}C and could rise to 40^{o}C in the month of April (Happold, 1987).

3.7 Vegetation

The vegetation of Taraba State comprises of three vegetation zones namely the Guinea Savannah, Sub-sudan and Semi-temperature zones. The Guinea Savannah, which is marked by mainly forest and tall grass are found in the southern part of the state, like Wukari, Ussa, Kurmi, Takum and Donga. The Sub-sudan type characterized by short grasses are found in Jalingo, Lau, Ardo-kola and are interspersed with short trees while the Semi-temperate zone are marked by Luxuriant pasture and short trees and are found on the Mambilla Plateau. Some of the commonly occurring tree species include Acassia sp, Afzelia africana,

Khaya senegalensis, Daniela oliveril, Isoberilinia doka and Vitelleria paradoxa while the dominant grasses are the Andropogon spp and Hypparhenia spp.

3.8 Fauna

The State fauna species include varieties of Antelopes such as kob (*Kobus kob*), waterbuck (*Kobus ellipsiprymnus*) reedbuck (*Redunca redunca*) African bufalo (*Syncerus caffer*), derby's eland (*Auratragus derbianus*), blue duiker (*Cephalophus monticola*), lion (*Panthera leo*), leopard (Panthera pardus), wild dog (*Lycaon pictus*) and the Cercopithecines such as olive baboon (Papio anubis) tantalus monkey (*Cercopithecus tantalus*) and patas monkey (*Erythrocebus patas*).

3.9 Study Design/Sampling Method

The study area is Taraba State, made up of three senatorial zones, which include Southern, Central and Northern Taraba. Each senatorial zone was stratified into Local Government Areas. Each Local Government Area was further stratified into communities.

The multistage and simple random sampling methods were used in the survey. Two Local Government Areas were randomly selected from each senatorial zone. Furthermore, ten (10) communities were randomly selected from each of the local Government Areas. Thus a total of 60 communities were sample. In each community, a minimum of five (5) households were sampled randomly. A

minimum of one (1) respondent of the age of eighteen (18) and above was randomly selected from each household.

3.10 Sampling Tool/Units

The sampling tool consisted of structured questionnaires designed to elicit information from the respondents, which were used in achieving the objectives of the study. Each respondent served as a sample unit.

3.11 Sample Frame/Size

Three hundred and seventy (370) questionnaires were distributed among 60 communities in the study area based on National Population Commission (NPC, 2006) census using Cochran (1977) proportional allocation technique as shown bellow.

$$nh = \frac{Nh \times n}{N}$$

Where: nh= serial number of each LGA

Nh= Number of people in each LGA

N=Total number of people in all the sample LGA

n= Number of questionnaires distributed among the sample districts

Hence, the ten (10) communities in each LGA received the following number of questionnaires:

Expressed mathematically:

Ardo-Kola LGA = $\frac{87,784 \times 360}{513,238}$ = 59

Yorro LGA = $\frac{89865 \times 360}{531,238}$ = 60

Gashaka LGA = $\frac{87,166 \times 360}{531238}$ = 59

Kurmi LGA = $\frac{91,282 \times 360}{531238}$ = 61

Ussa LGA = $\frac{90,839 \times 360}{531238}$ = 61

Ibbi LGA = $\frac{84,302 \times 360}{531238}$ = 57

3.12 Data Analysis

The data obtained was subject to descriptive statistics using mean and percentages.

Chi square analysis was also carried out.

CHAPTER FOUR

4.0 RESULTS

4.1: Identification of Wildlife Species that are Utilized in the Study Area.

Table 4.1 shows the checklist of fauna species identified to be utilized in the study area. A total of 4 species of birds, 5 species of reptiles and 22 species of mammals were identified. The avian species utilized include guinea fowl *(Numida meleagris),* ostrich *(Strutuo camelus),* francolin *(Francolinus albogularis)* and spurwinged goose (*plectopterus gambensis)* while among the reptiles were giant pangolin *(Manis gigantea),* nile crocodile *(Crocodiles niloticus),* monitor lizard *(Varanus niloticus),* rock python *(Python sebae)* and tortoise *(Chelonian spp)*. The mammals utilized include cane rat *(Thryonomys swinderianus),* bat *(Rousettus angolensis),*Giant rat *(Cricetomys gambainus),* baboon *(Papio anubis),* african elephant *(Loxodonta africana),* lion *(Panthera leon),* roan antelope *(Hippotragus equinus),* kob *(Kobus kob),* duiker *(Cephalophus rufilatus),* buffalo *(Syncerus caffer),* hare *(Lepus capensis),* hyeana *(Crocuta Crocuta),* patas monkey *(Erythrocebus patas),* gorilla *(Gorilla gorilla),* Hippopotamus *(Hippopotamus amphibius),* Chimpanzee (*Pan troglodytes*), porcupine *(Hystrix cristata),* squirrel *(Protoxerus stangeri),* warthog *(Phacochoerus africanus),* hedge hog *(Atelerix albiventris),* rock hyrax *(Procavia ruficeps),* leopard *(Panthera pardus),* and bushbuck *(Tragelpahus scriptus).*

Table 4.1. Checklist of Wildlife Species that are Utilized in Taraba State.

			Source of information					
Common Name	Hausa Name	*Scientific Name*	L	H	LR	PC	R	BM
Birds/Aves								
Guinea fowl	Zabuwa	*Numida maleagris*	x					
Purwinged goose	Agwagwan daji	*Plectopterus gambensis*	x		x			
Francolin	Fakara	*Francolinus albogular*				x		
Ostrich	Jimina	*Struthio camelus*	x					x
Reptiles								
Giant pangolin	dankunya	*Manis gigantean*	x					
Nile crocodile	kada	*Crocodilus niloticus*			x		x	x
Monitor lizard	damo	*Varanus niloticus*		x			x	x
Rock python	Mesa	*Python sebae*				x		x
Tortoise	Kunkuru	*chelonian spp*		x				
Mammals								
African giant rat	gafiya	*Cricetomys gambianus*	x					
Baboon	Goggo	*Papio Anubis*				x		x
African elephant	giwa	*Loxodants africana*	x				x	
Lion	zaki	*Panthera leon*			x		x	
Roan Antelope	Barewa	*Hippotragus equinus*			x			x

Bush buck	Gwanki	*Tragelpohus scriptus*	x					x
Kob	Mariya	*Kobus kob*				x	x	
Duiker	Makurna	*Cephalophus rufilatus*	x					x
Buffalo	bauna	*Syncerus cafer*	x					x
Hare	zumo	*Lepur cepensis*		x			x	
Hyeana	kura	*Crocuta crocuta*			x			x
Patas monkey	jan biri	*Erythocebus patas*	x			x	x	x
Rock Hyrax		*Procavia ruficeps*			x			
Hedge hog	bushiya	*Atelerix albiventris*				x		
Warthog	aleden daji	*Phacocherus africanus*				x	x	x
Squirrel	kurege	*Protoxerus stangeri*	x					
Porcupine	Beguwa	*Hystrix cristata*				x		
Chimpanzee	biri mai ganga	*Pan-troglodytes*		x				
Hippopotamus	Dorina	*Hippopotamus amphibious*	x				x	
Gorilla	bakin biri	*Gorilla gorilla*				x		
Bat	jamage	*Rousettus angolensis*		x			x	

KEY:

L - Literature
H - Hunters
BM - Bushmeat
PC - Processing Centre
LR - Local Residents
R - Respondents

4.2: The Perception of the Respondents Towards Wildlife resources Utilization.

Result of acceptability of bushmeat as food by the respondent in the study area is presented in Table 4.2. The result showed that 70.35% of the respondents accept bushmeat as food while 29.65% do not.

Table 4.3 presents the result of preference shown between bushmeat and domestics animals' meat by the respondents in the study area. 88.86% of the respondents prefer bushmeat to domestics animals' meat while only 10.13% indicated that they preferred domestic animals' meat to that of bushmeat.

On awareness of the values of wildlife species (Table 4.4), 90.75% of the respondents indicated that wildlife species have values while 9.25% were of the opinion that wildlife species have no value.

Result of the survey of prejudices against wildlife species by the respondents is presented in Table 4.5. The result indicated the level of prejudices (animals regarded as taboos) by the respondents for each species is as follows: chimpanzee (5.57%), cobra (12.75%), monkeys (9.16%), chameleon (7.17%), monitor-lizard (1.19%), snail (13.14%), tortiose (3.98%), vulture (1.59%), toad (1.19%), crabs (1.59%) bat (1.99%), lion (4.78%), hyeana (3.18%), baboons (3.58%), warthogs (7.17%), zebra (9.16%), buffalo (0.79%), tiger (1.99%), elephant (0.39%), civet cat (1.59%), rock hyrax (1.99%), gorilla (1.59%), crocodile (4.48%), python (1.59%)

Table 4.2. Acceptability of Bushmeat as food by the Respondents in the Study Area.

S/N	L.G.As	Those who eat bush meat	Those who do not eat bush meat
1	Ussa	38	21
2	Ibbi	42	20
3	Kurmi	40	14
4	Yorro	41	21
5	Gashaka	37	11
6	Ardo-kola	37	12
	Total	235 (70 .35)	99 (29.65)

Percentages in parenthesis

Table 4.3 Preference Shown Between Bushmeat and Domestics Animals' Meat by the Respondents in the Study Area.

SN	LGAs	Preference	
		Those That prefer Bushmeat to Domestic Animal's Meat	Those That preferred the meat of Domestic Animals to those of wild Animals
1	Ussa	42	6
2	Ibbi	48	3
3	Yorro	50	5
4	Kurmi	39	9
5	Gashaka	44	6
6	Ardo-kola	52	2
	Total	275 (89.86)	31 (10.13)

Percentages in parenthesis

Table 4.4: Respondents' Perception of the Values of Wildlife.

S/N	LGAs	Those who think that Wild animal have values	Those who think Wild animal have no values
1	Ussa	42	3
2	Ibbi	51	5
3	Yorro	33	8
4	Kurmi	44	7
5	Gashaka	52	5
6	Ardo-kola	53	0
	Total	275 (90.75)	28 (9.24)

Percentages in parenthesis

Table 4.5: Wildlife Species Regarded as Taboos by the Respondents in the Study Area .

Wild Animal Species	L.G.A.s							
	Ibbi	Ussa	Kurmi	Yorro	Ardo-kola	Gashaka	Frequency	Percent (%)
Chimpanzee	4	5	-	-	5	-	14	5.57
Cobra	12	9	2	4	1	4	32	12.74
Monkey	2	3	6	10	-	2	23	9.16
Chameleon	2	1	4	3	7	1	18	7.17
Monitor - Lizard	3	-	-	-	-	-	3	1.19
Snail	9	11	2	6	1	4	33	13.14
Tortoise	1	1	1	7	-	-	10	3.98
Vulture	1	-	-	4	-	-	4	1.59
Toad	1	-	-	-	-	2	3	1.19
Crabs	1	-	-	2	-	1	5	1.59
Bat	1	-	-	3	-	1	5	1.99
Lion	-	2	1	8	1	-	12	4.78
Hyeana	-	3	1	2	-	2	8	3.18
Baboons	-	2	2	3	-	2	9	3.58
Warthog	-	2	1	4	8	3	18	7.17
Zebra	-	1	5	10	5	2	23	9.16
Buffalo	-	1	-	1	-	-	2	0.79
Tiger	-	1	-	3	1	-	5	1.99
Elephant	-	1	-	-	-	-	1	0.39
Civet cat	-	-	2	-	-	2	4	1.59
Rock Hyrax	-	-	2	3	-	-	5	1.99
Gorilla	-	-	1	3	-	-	4	1.59
Crocodile	-	-	3	6	2	-	11	4.48
Python	-	-	-	-	-	4	4	1.59
Total	38	43	33	82	31	30	251	100

4.3. The Pattern and Level of Utilization of Wildlife Resources in the study Area.

The result of pattern of utilization of wildlife species in the study area is presented in Table 4.6. The result showed that 48.59%, 27.10%, 12.46%, 7,16% and 4.6% of the respondents used wildlife species as food, medicine, metaphases, decoration and others respectively in the study area.

Table 4.7 presents the result of the level of utilization of wildlife by the respondents in the study area. The result indicated that 91.00% of the respondents utilize wildlife species in one way or the other while 9.00 % do not utilize them in any way.

Parts of wildlife species utilized by the respondent are presented in Table 4.8, and include carcass (44.65%), skin (23.27%), skeleton (8.80%), hair (3.77%), horn (10.06%) and dung (9.43%).

Table 4.6 Pattern of Utilization of Wildlife Species in the Study area.

LGAs	Food	Medicine	Metaphase	Decoration	Others
Ussa	33 (62.26)	15 (28.30)	4 (7.54)	0 (0.00)	1 (1.88)
Ibi	23 (46.00)	5 (10.00)	9 (18.00)	10 (20.00)	3 (6.00)
Kurmi	34 (57.62)	10 (16.94)	6 (10.16)	6 (10.16)	3 (5.08)
Yorro	24 (38.70)	30 (48.38)	5 (8.06)	0 (0.00)	3 (4.83)
Gashaka	17 (42.50)	11 (27.50)	5 (12.50)	2 (5.00)	5 (12.50)
Ardokola	25 (43.85)	16 (28.07)	11 (19.29)	5 (8.77)	0 (0.00)
Total	156(48.59%)	87(27.10%)	40(12.46%)	23(7.16%)	15(4.67)

Percentages in parenthesis

Table 4.7 Level of Utilization of Wildlife by Respondent in Taraba State

LGAs	Number of Respondents that Utilize Wildlife in different ways	Number of Respondents that do not utilize wildlife in any way.
Ussa	61	0
Kurmi	56	3
Yoro	55	4
Gashaka	33	17
Ardokola	54	0
Ibbi	52	5
TOTAL	311(91.00)	29 (9.00)

Percentages in parenthesis

Table 4.8 Parts of Wildlife Species Utilized by the Respondents

Zones	Carcass	Skin	Skeleton	Hair	Horn	Dung
Ussa	15	8	4	-	4	5
Kurmi	10	7	-	2	7	1
Gashaka	11	3	3	-	2	3
Ibbi	20	4	-	-	-	2
Yorro	7	5	6	2	3	4
Ardokola	18	10	1	2	-	-
Total	71(44.65)	37(23.27)	14(8.80)	6(3.77)	16(10.06)	15(9.43)

Percentages in parenthesis

4.4 Factors Influencing the People's Attitude Towards Wildlife Resources Utilization in the Study Area.

4.4.1 Wildlife Utilization by the Respondents in Relation to Age in the Study Area

Tables 4.9 and 4.10 show the results of wildlife utilization by the respondents in relation to age and the chi square test of independence between age and utilization. The results also show percentage utilization for different age classes as follows: 10. 07% (18-23), 20.20% (24-19), 18.46% (30-35), 15.33% (36-41), 19.50% (42-47), 11.14% (48-53), 5.22% (54 and above). The result indicated that there is a significant positive association ($P< 0.05$) between Age and Utilization.

Table 4.9 Wildlife Utilization by the Respondents in Relation to Age in the Study Area.

LGAs	Age groups						
	18-23	24-29	30-35	36-41	42-47	48-53	54 above
Kurmi	-	12	09	14	13	08	02
Ibbi	06	09	12	09	10	04	07
Yorro	10	04	10	07	13	01	01
Ussa	05	15	13	03	11	6	1
Ardokola	06	11	07	07	03	08	04
Gashaka	02	07	02	04	06	06	-
Total	29(10.10)	58(20.20)	53(18.46)	44(15.33)	56(19.51)	32(11.14)	15(5.22)

Percentages in parenthesis

Table 4.10 Chi Square Test of Independence between Age and Utilization.

X^2_{cal}	X^2_{tab}	DF	P. Value
54.077	43.773	30	0.0045

4.4.2. **Wildlife Utilization by the Respondents in Relation to Occupation in the Study Area.**

Results of wildlife utilization by the respondents in relation to occupation in the study area indicated the percentage of civil servants, traders, farmers, hunters and applicants that utilized wildlife in the study areas are 29.65%, 11.03%, 28.96%, 8.96% and 21.37% respectively. The Chi square test of independence (Table 4.11 and 12) showed that a significant positive association ($P<0.05$) exist between occupation and utilization.

Table 4.11 Wildlife Utilization by the Respondents in Relation to Occupation in the Study Area.

LGA	Civil Servant	Trader	Farmer	Hunter	Applicants
Ussa	12	06	16	4	15
Kurmi	10	02	22	8	11
Yorro	08	05	18	08	05
Gashaka	32	02	4	-	9
Ardokola	10	03	10	2	10
Ibbi	04	14	14	4	12
Total	86(29.65)	32 (11.03)	84(28.96)	26(8.96)	6221.30 ()

Percentages in parenthesis

Table 4.12 Chi Square Test of Independence between Occupation and Utilization.

X^2_{cal}	X^2_{tab}	DF	P. Value
83.022	31.410	20	0.0001

4.4.3. Wildlife Utilization by the Respondents in Relation to Religion in the Study Area.

The results of wildlife utilization by the respondents in relation to religion indicated 73.6%, 15.60%, 4.40% and 6.5% for Christianity, Islam, and Pagan and the undecided respectively. The Chi square tests of independence are presented in Tables 4.13 and 4.14 respectively. It also showed that utilization depends on Religion.

Table 4.13 Wildlife Utilization in Relation to Religion in the Study Area.

LGAs	Christianity	Islam	Pagan	Undecided
Ussa	51	3	1	1
Yorro	30	13	12	-
Ibbi	42	12	-	6
Kurmi	44	11	-	3
Gashaka	42	7	-	6
Ardokola	42	7	2	6
Total	251(73.6)	53(15.58)	15(4.4)	22(6.5)

Percentages in parenthesis

Table 4.14 Chi Square Test of Independence between Religion and Utilization.

X^2_{cal}	X^2_{tab}	DF	P. Value
69.607	24.996	15	0.0001

4.4.4 Wildlife Utilization by Respondents in Relation to Income Level in the Study Area.

Tables 4.15 and 4.16 contain the results of wildlife utilization in relation to income level and the chi square test of independence between utilization and income level. The results showed that the percentage utilization for the different income levels were as follows: 27.87% (N1, 000-N5, 000), 18.47% (N 5,100- N10, 000), 19.86% (N10, 100-N15, 000), 29.27% (N15, 100-N20, 000) and 4.53% (N20, 100 and above). The result also indicated that income level relates positively with utilization.

Table 4.15. Wildlife Utilization in Relation to Income Level in the Study Area

LGAs	Monthly Income (₦)				
	1,000-5,000	5,100-10,000	10,000-15,000	15,100-20,000	20,100 and above
Gashaka	11	10	5	19	-
Ibbi	6	12	20	22	6
Ussa	18	15	8	11	3
Kurmi	10	5	11	6	2
Yorro	22	8	5	15	2
Ardo	13	3	8	11	-
Total	80(27.87)	53(18.47)	47(19.86)	84(29.27)	13(4.53)

Percentages in parenthesis

Table 4.16 Chi Square Test of Independence between Utilization and Income Level.

X^2_{cal}	X^2_{tab}	DF	P. Value
43.905	31.410	20	0.00015

4.4.5. Wildlife Utilization by the Respondents in Relation to Educational Level in the Study Area.

The results of wildlife utilization in relation to educational Level and the Chi square test of independence (Tables 4.17 and 4.18) showed that percentage utilization for non-formal, primary, secondary and tertiary educational levels were 10.51%, 26.12%, 55.73% and 7.64% respectively. It also indicated that there is a highly significant association ($P < 0.05$) between utilization and educational level.

Table 4.17: Wildlife Utilization by the Respondents in Relation to Educational Status in the Study Area

LGAs	Non formal	Primary	Secondary	Tertiary
Gashaka	1	19	28	-
Yorro	3	10	49	-
Kurmi	6	7	30	5
Ussa	8	17	18	9
Ardokola	15	14	9	8
Ibbi	-	15	41	2
Total	33(10.51)	82(26.12)	175(55.73)	24(7.64)

Percentages in parenthesis

Table 4.18 Chi Square Test of Independence between Utilization and Educational Level.

X^2_{cal}	X^2_{tab}	DF	P. Value
89.382	24.996	15	0.0001

4.5. The attitude of the Respondents Towards Wildlife Conservation.

Table 4.19 below shows the result of respondents' attitude towards the exploitation of wildlife resources in the study area. The result indicated that 73.39% of the respondents did not support indiscriminate exploitation of wildlife, 18.71% supported indiscriminate exploitation of wildlife while 7.89% had no opinion on the issue.

Table 4.20 below shows the result of respondents' attitude towards wildlife conservation for sustainable utilization of wildlife resources in the study area. 82.31% were ready to support conservation measures, 10.06% were not ready to support conservation measures while 7.62% are those that had no opinion.

Table 4.19. Respondents Attitude Toward the Exploitation of Wildlife Resources in the Study Area.

LGAs	Those who do not Support indiscriminate Exploitation of wildlife.	Those who Support indiscriminate Exploitation of wildlife.	Those who are undecided
Ussa	31	20	08
Ibbi	41	15	03
Kurmi	52	05	0
Yorro	48	08	04
Gashaka	49	04	05
Ardo-kola	30	12	07
Total	251(73.39)	64(18.71)	27(7.89)

Percentages in parenthesis

Table 4.20 Respondents Attitude Towards Wildlife Conservation.

LGAs	Those who are ready to support Conservation measures	Those who are not ready to support Conservation measures	Those who are undecided
Ussa	36	10	09
Ibbi	50	06	03
Kurmi	46	03	06
Yorro	50	02	07
Gashaka	49	02	0
Ardo-kola	39	10	0
Total	270(82.31)	33(10.06)	25(7.62)

Percentages in parenthesis

CHAPTER FIVE

DISCUSSION

5.1 Identification of Wildlife Species that are Utilized in the Study Area.

In this study, local residents in sixty communities in Taraba State were sampled to identify the wildlife species (game animals) they utilized for various purposes. A total of 4 species of birds, 5 species of reptiles and 22 species of mammals, were identified as being utilized for various purpose in the study area. The result indicated that more species of mammals were utilized than any other class of animals in the study area. The difference might not be unconnected with the fact that limited species are found in the other class of animals and also for the reason that most species of mammals are socially accepted as food and for other purposes. The observation agrees with the finding of Happold (1987) for wild animals' abundance in the savannah ecosystem. The result is also indicative of the fact that a wide range of wild animal species are socially acceptable to people in the study area. This is true when the result is examined from the background that a reasonable proportion of the species of each class of animals represented in the state are utilized in the study area.

5.2 The Perception of the Respondents Towards Wildlife Resources Utilization.

The result of acceptability of bushmeat by the respondents in the study area indicates high acceptability (70.35%) as against low unacceptability (29.65%) in the study area. This may not be unconnected with the facts that domestic animals are scarce and expensive, hence the people rely more on bushmeat for their protein need.

The result of preference shown by the respondents between bushmeat and domestic animals' meat indicated higher preference to bushmeat than to domestic animals' meat. The result suggests that the palatability of bushmeat may be higher than that of domestic animals' meat. This is in consonance with the observations of Akosim and Mamman (2000) on bushmeat preference by both rural and urban dwellers.

The result of awareness of the values of wildlife indicates that most of the respondents (90.75%) were aware of the values of wildlife species. This finding suggests that wildlife conservation measures are likely to be supported by the people in the study area. This observation agrees with the report of Ijomah and Akosim (2000) that people tend to support wildlife conservation when they are aware of the values of wildlife resources.

Result of survey of prejudice against wildlife species indicated that some wildlife species are regarded as taboos in the study area. Only cobra, snails, chimpanzee and monkeys were more highly prejudiced against, indicating that most other species are at risk of being exploited to extinction if strict conservation measures are not enforced.

5.6 The Pattern and Level of Utilization of Wildlife Resources in the Study Area.

The pattern of wildlife utilization in the study area indicated that food and medicine were the major uses of wildlife species. Other uses of wildlife species such as pets, security, metaphysics, education, research and conservation seemed not to receive the desired patronage in the study area. This type of inconsistency is not unexpected as high level of enlightenment and or education are required to appreciate and utilized wild animal resources for recreation, education, research and as pets. The parts of wildlife utilized were in consonance with the pattern of utilization. The high level of utilization of carcasses and skins of the animals is not unconnected with the predominant use of wildlife species as food while the hair, horn, dung and skeleton are largely associated with medicine and metaphysics. This finding agrees with the observation of Akosim and Mamman (2000).

The result of the level of utilization of wildlife species in the study area indicated high level (91.00%) of utilization. However, carcass utilization was

shown to be the major way of utilization of wild animals in study area. The high level of utilization mainly for the purpose of meat portends a great danger for wildlife conservation and sustainable utilization of wildlife resources in the study area. This is because, the animals have to be killed before they can be utilized for meat. This finding therefore suggests that adequate conservation measures have to be put in place immediately if they do not exist. If they exist, then they should be strictly enforced to prevent the extinction of wildlife species and serious ecological imbalance in the study area.

5.7 Factors Influencing the Attitude of the People Towards Wildlife Utilization in the Study Area.

Investigation into the relationship between wildlife utilization and age, occupation, income level, educational status and religion in the study area revealed that a significant positive association ($p<0.05$) exist between them. This indicates that the majority of the people in the study area would eat bushmeat if it is readily available irrespective of age, occupation, income level, educational status and religion. This finding agrees with the report of Asibey and Child (2008) on bushmeat consumption in African countries. The variations observed in the frequency distributions of wildlife utilization within the factors may be accounted for by the ratio with which the questionnaires were distributed to various categories of respondents under each factor.

5.8 Attitude of Respondents Towards Wildlife Conservation

Results of the investigation indicated that those who do not support indiscriminate exploitation of wildlife resources (73.39%) are by far greater than those who support the indiscriminate exploitation of wildlife resources (18.71%). In addition, those who are willing to support wildlife conservation measures (82.31%) are also greater than those who are unwilling to support wildlife conservation (10.06%).

The above results suggest that the implementation of wildlife conservation and management measures will meet little or no resistance from the people in the study area. However, Asibey and Child (2008) observed that if wildlife conservation for sustainable utilization must succeed in the long term, it must be able to provide the people with significant and sustainable benefits in terms of both food (alternative source of bushmeat) and income. This is only possible if the observation of Ijomah and Akosim (2000) on subsistence captive breeding (domestication) and game ranching are adopted.

CHAPTER SIX

Summary, Conclusion and Recommendations

6.1 Summary

This study investigated the utilization of wildlife species, pattern and level of utilization, factors affecting utilization and the attitude of respondents towards wildlife utilization.

For the purpose of this study six Local Government Areas in Taraba State were randomly sampled using structured questionnaires. Thirty-one (31) species of fauna were identified to be utilized by the respondents in the study area. Of the 31 species, 4 belonged to the avian class, 5 to the reptilian class and 22 to the mammalian class.

The respondents showed high acceptability (70.35%) for bushmeat and also preferred bushmeat to domestic animals' meat. Wildlife resources were utilized more as food (48.59%) and medicine (27.10%) than for any other use. Majority of the respondents (91.00%) utilized wild animals for various purposes. Parts of wild animals found to be used for various purposes include carcass, skin, skeleton, dung, horn and the hair. The carcass of the animals were utilized (44.65%) more than any other part of the animals.

The results also indicated that factors such as age, occupation, religion, income level and educational level influence wildlife utilization. Majority of the

respondents (73.39%) indicated willingness to support the conservation of wildlife resources in the study area.

6.2 Conclusion

In conclusion, this study has revealed that a wild range of wildlife species that exist in Taraba State are utilized by a significant proportion of the population mainly for food and medicine and for other purposes. The result of the study also showed that some socio—economic and cultural factors affect the utilization of the wildlife resources in the study area. However, the result also indicated that the people will be willing to participate in conservation measures aimed at sustainable utilization of wildlife resources in the State, if involved.

6.3 Recommendations

In view of the findings of this study, the following recommendations are made:

1. in view of the high acceptability of bushmeat for meat and other ways of utilization of wildlife resources in the study area, the State government and NGOs should encourage the people to go into wildlife farming, such as wildlife domestification/captive breeding and game ranching at either semi-intensive or extensive levels. This measure will reduce the pressure

on those in the wild, a situation that will help their population to build up for sustainable utilization

2. The people's willingness to support wildlife conservation measures as revealed in the study suggests that the government should practically involve the people in both the articulation and enforcement of conservation measures in the State. This will guarantee the success of sustainable utilization of wildlife resources in the State.

REFERENCES

Adebayo R.A. (1970) Forestry and the Nigerian forest. *In: Proceeding of the inaugural conference of Forestry Association of Nigeria*. Held on 10th October, 1970 at Lagos.

Adeola, M.O. and Decker, E. (1987) Wildlife Utilization in Rural Nigeria*: In: Proceedings of the International Symposium and Conference on Wildlife Management in Sub-Saharan Africa, Harare Zimbabwe* Oct. 6th – 13th Editors Ola – Adams B.A. and Ojo L.O. 53 – 65.

Adeyoju, S.K. (1975). *Forestry and Nigerian Economy* 1st Edition Ibadan University Press, Ibadan: 308.

Afolayan, T.A. and Ajayi, S.S. (1983), Fifty Years of Nigeria Wildlife Resources Nigerian Field, 44 (4): 130-144.

Ajayi, I. F, (1979) Food and Animal Products from Tropical Forest: Utilization of wildlife and by-Product in West Africa. FAO Commission Consultancy Report, FAO, Rome.

Ajayi, S.S. (1974). The Biology and Domestication of the Africa Giant Rat. *Cricetomys Gambianus Water House*. Unpublished. PhD Thesis, University of Ibadan, Nigeria 1 – 130.

Akosim, C. (1997). Evaluation of Biodiversity Conservation and Management. Programmes in Pandan Wildlife Park Jos, Nigeria. Unpublished Ph.D Thesis, University of Ibadan. 1-30.

Akosim, C. and Buba U.N. (2007). An Investigation of the Behaviour of Pregnant and Lactatin Baboons (papio anubis) At Gashaka Gumti National Park, Negeria.

Akosim, C. and Mamman, G.S. (2000). Ethnozology and Sustainable *In: Proceeding on Development of Agriculture in Adamawa,* Edited by Igwe, E.I, Mshelia, S.J. and Jada, Y.Y.M 1-8.

Alo, E.B; Akosim, C and Arifalo, E.I (1997), An Appraisal of Environmental and Socio Economic Values of Ex-situ and In-situ Wildlife Conservation Programme in Nigeria. *In: proceeding on the control of environmental degradation in Nigeria*, Organized by the Forestry Association of Nigeria on 26th of May, 2011 at Zaria Hotel, Edited by Igwe, E.I Mshelia, S.J. and Jada, Y.Y.M 1 – 8.

Anstey, S. (1991). Wildlife Utilization in Liberia. Wildlife Survey Report. World Wildlife Fund and Liberian Forest Development Authority, Gland, Switzerland http://wwwfao org/docrep/t8860E/t8860oe03.htm.

Asibey, E.A.O. and Child, G.S. (2008) Wildlife Management for Rural Development in Sub-Sahara Africa. Nature et-Faune 7:36-47. http://wwwfao org/docrep/t8860E/t8860oe03.htm.

Auzel, P. and Wikie, D.S. (2002). Wildlife Use in Northern Congo: Hunting in a Commercial Logging Concession. *In: Proceeding on Hunting for Sustainability in Tropical Forests:* (Eds J.G. Robison and E.L. Bernnett). 413-426. New York: Columbia University Press.

Ayeni, J.S.O, (1988) *Wildlife and Fisheries Development in Nigeria*, OBECHE (1988): 15-26.

Ayeni, J. S. O., Afolayan, T.A and Ajayi, S.S (1982) *Introductory Handbook on Nigerian Wildlife*. 1st edition. Published by SAOLOG Printing Productions, Ilorin: 4-7.

Ayodele I.A. Abin, C.O and Alarape A.A. (1999) *Essentials of Wildlife Management* by Jachin Publishers Ibadan, 7 – 8.

Barton, M.A. (1986). Hunters and gatherers. Culled from Global Biodiversity, Status of the Earth's Living Resources. A Report compiled by World Conservation Monitoring Centre. Edited by Brain Groombridge (1992) Published by Chapman and Hall. 359-390.

Bennett, B.C. 2002. Forest Products and traditional peoples: Economic, Biological, and Cultural considerations. *Natural Resources Forum* 26 (4): 293 – 301.

Brain, G. (1992), *Global Biodiversity,* Status of the Earth's Living Resources. Compiled by World Conservation Monitoring Center, Published by Chapman and Hall. London.

Brown, O. (1989). The Viewing of Elephants: In the Ivory Trade and the Future of the African Elephants. Ivory Trade Review Group Report. Prepared for the 7th meeting of the Conference of the Parties to CITES. Published by Melbourne, Medras: 335-341.

Bubenik, A.B. (1989). *Sport Hunting: In: the Global Biodiversity, Status of the Earth's Living Resources* Compiled by WCMC London: Published by Chapman and Hall. 1-585.

Charter, J.R, (1970) The Economic Value of Wildlife in Nigeria. *In: Proceedings of first Annual Conference of Forestry Association of Nigeria.* University of Ibadan.

Cochran, W.G (1977): *Sampling Teaching* (Third edition) John Willy and Sons, New York 50-52.

Colyn, M, Dudu, A and Mbaele, M. (1988). Data on Small and Medium Scale Game Utilization in the Rain Forest of Zaire. *In: Proceedings of the international Symposium and Conference on wildlife Management in Sub-Saharan Africa*, 6-13th October. Harare, Zimbabwe. 106-141.

Dunn, A. (1993). A manual of Census techniques for Surveying Large Mammals in tropical forest. A report prepared for the World Wide Fund for Nature (WWF - UK) 1 – 20.

Eltringhan, S.K. (1984) *Wildlife Resources and Economic Development* John Wiley and son ltd New York.

FAO, 1991. Food Balance Sheets, FAO, Food Technical Paper, No. 92. FAO, Rome.

F.A.O, (1979). Handbook of Utilization of Aquatic Plants, FAO, Fisheries Technical Paper, No: 187. FAO, Rome

Gawaisa, S.G. (2001). Population Dynamics of Mammals in the Savanna Zones and Management Programmes in Gashaka Gumti National Park Nigeria. An unpublished M.Sc. dissertation of Federal University of Technology, Yola, Nigeria.

Happold, D.C.D (1987). *The Mammals of Nigeria*. 1st edition Oxford University Press, Oxford 32.

Hemley, G. (1988). *International Wildlife Trade in W.J. Chandler* (Ed) Wildlife Reports Academic Press, New York: 1-45.

Hussain, Z. (1997). The Sundarbans. In: The role of the convention on wetlands in the conservation and wise use of Biodiversity edited by Hails A.J. Publisher; Ramsar convention Bureau, Gland, Switzerland. 51 – 53.

Ijomah, J.U. and Akosim, C (2000). *Elements of Biological Conservation.* Trinity graphics Systems Ltd, Jos: 1st edition PP 1-26.

International Union for Conservation of Nature (IUCN) (1980). World Conservation Strategy Living Resources Conservation for Sustainable Development. International Union for Conservation of Nature *IUCN, (1993). Parks for life:* Report of the 10th World Congress on National Parks and protected Areas. IUCN, Gland. Vol. 8 No. 1, 50 – 57.

Kwaga, B. (1999): Species list and Age Sex Composition of Wildlife Harvest in the Northern Guinea Savanna Zone of Adamawa State. Unpublished B. Tech. Project. Federal University of Technology, Yola, Nigeria.

Luxmore, R.A. (1989). International Trade. *In: Global Biodiversity Status of the Earth's Living Resources.* Compiled by WCMC Published by Chapman and Hall, London: 310-585.

Martins, G. (1991). *The Rainforest of West Africa: Ecological Threats Conservation.* 1st edition Norkhauser Verlag, Berlin: 1-235.

Nicol, B.M. (1953) Protein in the Diet of the Isoko tribe in Niger Delta. *Proc. Nutrition Soc.* 12:66-69.

Olayide S.O, (1981) *Scientific Research and the Nigerian Economy.* Ibadan University Press, Ibadan. 83.

Redford, R.H. and Robinson, J.G. (1991) Subsistence and Commercial Uses of Wildlife *In: Global Biodiversity, the Status of the Earth's Living Resources.* A Report Compiled by WCMC. Edited by Brain Groombridge. Published by Chapman and Hall, London: 359-406.

Rikwentishe F. (1999). Students Perceptions of, and Attitude Toward Forestry Degree programme B. Tech. Project Submitted to the Federal University of Technology, Yola, Nigeria. For the Award of Bachelor of Technology in Forestry and Wildlife Management.

Taraba State Diary 2010.

Vedder, A. Webber, W. (1990). Living with Wildlife in Mountain Gorilla Project-Rwanda Unpublished report World Bank Environment Division, Africa Region 83-90.

Wilson, K.B. (1990). Ecological dynamics and Human Welfare*:* A Case Study of Population Health and Nutrition in Southern Zimbabwe. Ph.D thesis, University of London.

World Wildlife Fund-WWF (1990). Newsletter of Cross-River National Park Project. 1st issue 1-16.

APPENDICES

APPENDIX (I)

FEDERAL UNIVERSITY OF TECHNOLOGY YOLA,
SCHOOL OF AGRICULTURE AND AGRICULTURAL TECHNOLOGY,
DEPARTMENT OF FORESTRY AND WILDLIFE MANAGEMENT.
P.M.B. 2076 YOLA ADAMAWA STATE.

Dear Respondent,

I am a postgraduate student in the above University undertaking a study on the Topic: *A Survey of Wildlife Resources Utilization in Taraba State, Nigeria.* I would be grateful if you could furnish me with relevant information needed in this questionnaire, all information provided by you will be confidential

Instruction: fill in the boxes provided by ticking or writing in the blank spaces where applicable.

Section "A".

Personal Data

1. Name._____
2. Tribe._____
3. Local Government of Origin_____
4. State of Origin._____(For Non Nigerians only)
5. Age._____

6. Sex (a) Male [ ] (b) Female [ ]

7. Religion (a) Christianity [ ] (b)Islam [ ] Others (Specify)_____

8. Marital Status: (a)Married [ ] (b) Single [ ] Others (Specify)_____

9. Educational Status: (a) Primary School [ ] Secondary School [ ] (c) Tertiary Education [ ]

10. Occupation: (a) Civil Servant [ ] (b) farmer [ ] (c) Trader [ ] (d) house wife [ ] (e) Applicant [ ] (f) Hunter [ ] (g) Any other (please specify).

Personal Income (a) N1, 000-5,000 (b) N 5,100-10,000 (c) N 10,100-15,000 (d) 15,100-20,000.

Section B: (Level and Pattern of Utilization)

1. Do you use wildlife resources? Yes [ ] No [ ]

2. If your answer in question one is yes in which of the following ways do you use wildlife resources? (a) Food (b) Medicine (c) Metaphase (e) decoration

3. Which parts of wild animals species do you eat or use for some other

4. Purposes?_____

S/N	Wildlife Species	Part of the animal Utilized	Purpose of Utilization

4. Where do you acquire them?

(a) From the community forest through hunting. (b) From the local market through Purchase (c) From hunter through purchase (d) Any other sources (specify).

5. What wildlife species are commonly available for utilization in your community? (List them)_____

_____

_____

6. Which of the wildlife species do you prefer as meat? List them in order of your preference for the animals.

_____

_____

_____

7. Do you regard the meat of wild animals to that of domestic animals? Yes [ ] No [ ]

8. Do you regard some wildlife species as taboos due to either culture or religion? Yes [ ] No [ ]

9. If Yes in 8 above, list the species involved.

Section C. (Perception and Attitude)

10. Do you think wild animals have any value? (a) Yes (b) No

11. If Yes in question 10 above, list the value of wild animals.

_____

_____

_____

12. Do you support the indiscriminate killing of wild animal? (a) Yes (b) No

13. Would you support any measure that will ensure the conservation of wild animals? (a) Yes (b) No

APPENDIX (II)

List of Tables

Table 4.1. Checklist of Wildlife Species that are Utilized in Taraba State.

			Source of information					
Common Name	Hausa Name	*Scientific Name*	L	H	LR	PC	R	BM
Birds/Aves								
Guinea fowl	zabuwa	*Numida maleagris*	x					
Purwinged goose	Agwagwan daji	*Plectopterus gambensis*	x		x			
Francolin	fakara	*Francolinus albogularis*				x		
Ostrich	jimina	*Struthio camelus*	x					x
Reptiles								
Giant pangolin	dankunya	*Manis gigantean*	x					
Nile crocodile	kada	*Crocodilus niloticus*			x		x	x
Monitor lizard	damo	*Varanus niloticus*		x			x	x
Rock python	Mesa	*Python sebae*				x		x
Tortoise	Kunkuru	*chelonian spp*		x				
Mammals								
African giant rat	gafiya	*Cricetomys gambianus*	x					
Baboon	Goggo	*Papio Anubis*				x		x
African elephant	giwa	*Loxodants africana*	x				x	
Lion	zaki	*Panthera leon*			x		x	
Roan Antelope	Barewa	*Hippotragus equinus*			x			x
Bush buck	Gwanki	*Tragelpohus scriptus*	x					x
Kob	Mariya	*Kobus kob*				x	x	
Duiker	Makurna	*Cephalophus rufilatus*	x					x

Buffalo	bauna	*Syncerus cafer*	x					x
Hare	zumo	*Lepur cepensis*		x			x	
Hyeana	kura	*Crocuta crocuta*			x			x
Patas monkey	jan biri	*Erythocebus patas*	x			x	x	x
Rock Hyrax		*Procavia ruficeps*			x			
Hedge hog	bushiya	*Atelerix albiventris*				x		
Warthog	aleden daji	*Phacocherus africanus*				x	x	x
Squirrel	kurege	*Protoxerus stangeri*	x					
Porcupine	Beguwa	*Hystrix cristata*				x		
Chimpanzee	biri mai ganga	*Pan-troglodytes*		x				
Hippopotamus	Dorina	*Hippopotamus amphibious*	x				x	
Gorilla	bakin biri	*Gorilla gorilla*				x		
Bat	jamage	*Rousettus angolensis*		x			x	

APPENDIX (III)

Table 4.2. Acceptability of Bushmeat as food by the Respondents in the Study Area.

S/N	L.G.As	Those who eat bush meat	Those who do not eat bush meat
1	Ussa	38	21
2	Ibbi	42	20
3	Kurmi	40	14
4	Yorro	41	21
5	Gashaka	37	11
6	Ardo-kola	37	12
	Total	235	99
	Percent (%)	70 .35	29.65

APPENDIX (IV)

Table 4.3 Preference Shown Between Bushmeat and Domestics Animals' Meat by the Respondents in the Study Area.

SN	LGAs	Preference	
		Those That prefer Bushmeat to Domestic Animal's Meat	Those That preferred the meat of Domestic Animals to those of wild Animals
1	Ussa	42	6
2	Ibbi	48	3
3	Yorro	50	5
4	Kurmi	39	9
5	Gashaka	44	6
6	Ardo-kola	52	2
	Total	275	31
	Percentage	89.86%	10.13%

APPENDIX (V)

Table 4.4: Respondents' Perception of the Values of Wildlife.

S/N	LGAs	Those who think that Wild animal have values	Those who think Wild animal have no values
1	Ussa	42	3
2	Ibbi	51	5
3	Yorro	33	8
4	Kurmi	44	7
5	Gashaka	52	5
6	Ardo-kola	53	0
	Total	275	28
	Percentage	90.75%	9.24%

APPENDIX (VI)

Table 4.5: Wildlife Species Regarded as Taboos by the Respondents in the Study Area .

Wild Animal Species	L.G.A.s							
	Ibbi	Ussa	Kurmi	Yorro	Ardo-kola	Gashaka	Frequency	Percent (%)
Chimpanzee	4	5	-	-	5	-	14	5.57
Cobra	12	9	2	4	1	4	32	12.74
Monkey	2	3	6	10	-	2	23	9.16
Chameleon	2	1	4	3	7	1	18	7.17
Monitor - Lizard	3	-	-	-	-	-	3	1.19
Snail	9	11	2	6	1	4	33	13.14
Tortoise	1	1	1	7	-	-	10	3.98
Vulture	1	-	-	4	-	-	4	1.59
Toad	1	-	-	-	-	2	3	1.19
Crabs	1	-	-	2	-	1	5	1.59
Bat	1	-	-	3	-	1	5	1.99
Lion	-	2	1	8	1	-	12	4.78
Hyeana	-	3	1	2	-	2	8	3.18
Baboons	-	2	2	3	-	2	9	3.58
Warthog	-	2	1	4	8	3	18	7.17
Zebra	-	1	5	10	5	2	23	9.16
Buffalo	-	1	-	1	-	-	2	0.79
Tiger	-	1	-	3	1	-	5	1.99
Elephant	-	1	-	-	-	-	1	0.39
Civet cat	-	-	2	-	-	2	4	1.59
Rock Hyrax	-	-	2	3	-	-	5	1.99
Gorilla	-	-	1	3	-	-	4	1.59
Crocodile	-	-	3	6	2	-	11	4.48
Python	-	-	-	-	-	4	4	1.59
Total	38	43	33	82	31	30	251	100

APPENDIX (VII)

Table 4.6 Pattern of Utilization of Wildlife Species in the Study area.

LGAs	Food	Medicine	Metaphase	Decoration	Others
Ussa	33 (62.26)	15 (28.30)	4 (7.54)	0 (0.00)	1 (1.88)
Ibi	23 (46.00)	5 (10.00)	9 (18.00)	10 (20.00)	3 (6.00)
Kurmi	34 (57.62)	10 (16.94)	6 (10.16)	6 (10.16)	3 (5.08)
Yorro	24 (38.70)	30 (48.38)	5 (8.06)	0 (0.00)	3 (4.83)
Gashaka	17 (42.50)	11 (27.50)	5 (12.50)	2 (5.00)	5 (12.50)
Ardokola	25 (43.85)	16 (28.07)	11 (19.29)	5 (8.77)	0 (0.00)
Total	156(48.59%)	87(27.10%)	40(12.46%)	23(7.16%)	15(4.67)

Percentages in parenthesis

APPENDIX (VIII)

Table 4.7 Level of Utilization of Wildlife by Respondent in Taraba State

LGAs	Number of Respondents that Utilize Wildlife in different ways	Number of Respondents that do not utilize wildlife in any way.
Ussa	61	0
Kurmi	56	3
Yoro	55	4
Gashaka	33	17
Ardokola	54	0
Ibbi	52	5
TOTAL	311	29
Percentage	91%	9%

APPENDIX (IX)

Table 4.8 Parts of Wildlife Species Utilized by the Respondents

Zones	Carcass	Skin	Skeleton	Hair	Horn	Dung
Ussa	15	8	4	-	4	5
Kurmi	10	7	-	2	7	1
Gashaka	11	3	3	-	2	3
Ibbi	20	4	-	-	-	2
Yorro	7	5	6	2	3	4
Ardokola	18	10	1	2	-	-
Total	71(44.65)	37(23.27)	14(8.80)	6(3.77)	16(10.06)	15(9.43)

Percentages in parenthesis

APPENDIX (X)

Table 4.9 Wildlife Utilization by the Respondents in Relation to Age in the Study Area.

LGAs	Age groups						
	18-23	24-29	30-35	36-41	42-47	48-53	54 above
Kurmi	-	12	09	14	13	08	02
Ibbi	06	09	12	09	10	04	07
Yorro	10	04	10	07	13	01	01
Ussa	05	15	13	03	11	6	1
Ardokola	06	11	07	07	03	08	04
Gashaka	02	07	02	04	06	06	-
Total	29	58	53	44	56	32	15
Percentage	10.10	20.20	18.46	15.33	19.51	11.14	5.22

Table 4.10 Chi Square Test of Independence between Age and Utilization.

X^2_{cal}	X^2_{tab}	DF	P. Value
54.077	43.773	30	0.0045

APPENDIX (XI)

Table 4.11 Wildlife Utilization by the Respondents in Relation to Occupation in the Study Area.

LGA	Civil Servant	Trader	Farmer	Hunter	Applicants
Ussa	12	06	16	4	15
Kurmi	10	02	22	8	11
Yorro	08	05	18	08	05
Gashaka	32	02	4	-	9
Ardokola	10	03	10	2	10
Ibbi	04	14	14	4	12
Total	86	32	84	26	62
Percentage	29.65	11.03	28.96	8.96	21.30

Table 4.12 Chi Square Test of Independence between Occupation and Utilization.

X^2_{cal}	X^2_{tab}	DF	P. Value
83.022	31.410	20	0.0001

APPENDIX (XII)

Table 4.13 Wildlife Utilization in Relation to Religion in the Study Area.

LGAs	Christianity	Islam	Pagan	Undecided
Ussa	51	3	1	1
Yorro	30	13	12	-
Ibbi	42	12	-	6
Kurmi	44	11	-	3
Gashaka	42	7	-	6
Ardokola	42	7	2	6
Total	251	53	15	22
Percentage	73.6%	15.58	4.4	6.5

Table 4.14 Chi Square Test of Independence between Religion and Utilization.

X^2_{cal}	X^2_{tab}	DF	P. Value
69.607	24.996	15	0.0001

APPENDIX (XIII)

Table 4.15. Wildlife Utilization in Relation to Income Level in the Study Area

LGAs	Monthly Income (₦)				
	1,000-5,000	5,100-10,000	10,000-15,000	15,100-20,000	20,100 and above
Gashaka	11	10	5	19	-
Ibbi	6	12	20	22	6
Ussa	18	15	8	11	3
Kurmi	10	5	11	6	2
Yorro	22	8	5	15	2
Ardo	13	3	8	11	-
Total	80	53	47	84	13
Percentage	27.87	18.47	19.86	29.27	4.53

Table 4.16 Chi Square Test of Independence between Utilization and Income Level.

X^2_{cal}	X^2_{tab}	DF	P. Value
43.905	31.410	20	0.00015

APPENDIX (XIV)

Table 4.17: Wildlife Utilization by the Respondents in Relation to Educational Status in the Study Area

LGAs	Non formal	Primary	Secondary	Tertiary
Gashaka	1	19	28	-
Yorro	3	10	49	-
Kurmi	6	7	30	5
Ussa	8	17	18	9
Ardokola	15	14	9	8
Ibbi	-	15	41	2
Total	33	82	175	24
Percentages	10.51	26.12	55.73	7.64

Table 4.18 Chi Square Test of Independence between Utilization and Educational Level.

X^2_{cal}	X^2_{tab}	DF	P. Value
89.382	24.996	15	0.0001

APPENDIX (XV)

Table 4.19. Respondents Attitude Toward the Exploitation of Wildlife Resources in the Study Area.

LGAs	Those who do not Support indiscriminate Exploitation of wildlife.	Those who Support indiscriminate Exploitation of wildlife.	Those who are undecided
Ussa	31	20	08
Ibbi	41	15	03
Kurmi	52	05	0
Yorro	48	08	04
Gashaka	49	04	05
Ardo-kola	30	12	07
Total	251	64	27
Percentage	73.39	18.71	7.89

Table 4.20 Respondents Attitude Towards Wildlife Conservation.

LGAs	Those who are ready to support Conservation measures	Those who are not ready to support Conservation measures	Those who are undecided
Ussa	36	10	09
Ibbi	50	06	03
Kurmi	46	03	06
Yorro	50	02	07
Gashaka	49	02	0
Ardo-kola	39	10	0
Total	270	33	25
Percentage	82.31	10.06	7.62