



NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF SCIENCE AND TECHNOLOGY

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COURSE TITLE: WILDLIFE ECOLOGY AND CONSERVATION

BIO 412 WILDLIFE ECOLOGY AND CONSERVATION (3 UNITS)

Module 1

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Module 1

Unit 1: General principles of ecosystem Management

1.0 Introduction:

The aim of wildlife management is to maintain and improve wildlife and control animal population by managing the habitat. The management is concerned primarily with production of quality

and quantity on a sustained yield basis, but at times control measures are undertaken to preserve a species or to hold its population within bounds. Game management is the term applied to the production and harvesting of animal for sport. However, wildlife management is a broader term applying to all species of wild animal life, including birds, furbearers and fish. Wildlife depends on the vegetation for its existence. The type of plant formation and its stage in ecological succession determine the species and number of animals which can occupy a habitat. Such species as mouse, elk, black-tailed deer, fox, lynx and beaver are most often found in the early deciduous tree and shrub phases of natural succession. In the sub-climax and climax stages, these animals occur mainly along the forest's edge, where the mature climax forest joins parkland, alpine, grassland, or smaller openings, such as rivers, lakes, swamps, fields, and recently logged areas. These species make only intermittent use of the dense climax forest, remaining there during rest and breeding periods, and retreating there for protection against their enemies. The inter-relationship of the plant and animal communities must be closely coordinated for their respective management. The interaction in the ecosystem must also be highlights.

For example, ecology is the study of organism in relation to the surroundings in which they lives. These surroundings are called the environment of the organism. This environment is made up of many different components, including other living organisms and their effects, and purely physical features such as the climate and soil type. The ability of organisms to exist and live in the environment determines its success or failure. Wildlife ecology and conservation is to prevent individual species of wild animals, or sometimes whole communities from becoming extinct either regionally or globally. Conservation strategy must be set to objectives (the why and what the conservation) and identify for conservation action those priority species and areas that will allow the most effective use of available resources (the where of conservation). Nigeria is blessed with a rich and unique array of ecosystems and great variety of wildlife, but the conservation of these

resources remains precarious. Up to the mid 70s, the Federal and State Governments have made some effort to establish a number of wildlife conservation or protected areas in the country. These include some 31 game reserves, 4 or 5 game sanctuaries and 7 National Parks. The game reserves and sanctuaries, directly owned and managed by the State Governments have specific objectives to protect endangered species, promote sustainable harvest, and promote conservation education and tourism. The National Parks and Strict Nature reserves, developed and managed by the Federal Government under the exclusive legislative list, are to enhance the protection of endangered species, promote scientific research, encourage educational knowledge and promote ecotourism. However, the prevailing reality is that with the exception of the National Parks, most other protected areas exist only on books. The game reserves and the game sanctuaries lack any protection, day to day management or managers and some game reserves exist only on paper. They have been illegally de-reserved and turned into fuel wood exploitation sites, farms or grazing sites for domestic animals. The legislation and control of wildlife resources outside of protected areas, including those on private lands also fall under the jurisdiction of State authorities. Up to the late 70s this responsibility was carried out well through careful administrative controls such as the issuance of hunting licenses and disposal permits by state Forestry services. Wildlife conservation and management practice effectively ceased to exist from the mid 80s. The game reserves that survived in to the 90s did so because of the moral and financial interventions provided by Non-Governmental Organizations (NGO) like the Nigerian Conservation Foundation (NCF) and Savannah Conservation (formerly Yankari Initiative). The question now, what are recent developments in laws, regulations and policies that influence wildlife conservation.

2.0 Objectives:

At the end of this course, students must be familiar with the role of conservation and enhancement in the context of ecological process, effects of forest ecosystems and management practices

involved in conservation of wildlife so as to minimize the conflicts between wildlife and forestry.

3.0 Main content

3.1 Principles of Sustainable management of the ecosystems:

Ecosystem management is a process that aims to conserve major ecological services and restore natural resources while meeting the social-economic political and cultural needs of current and future generations. Therefore, the issue of sustainable development must be taken seriously in pursuit of ecosystem management. Sustainable development implies development which, while protecting the environment, allows a type and level of economic activity that can be sustained into the future with minimum damage to people or the ecosystem. Sustainable development advocates leaving to future generations a stock of natural resources no less than that inherited by previous generations. This means preventing irreversible changes to environmental assets which have no substitutes, preventing the loss of the ozone layer and living spaces, and damage to the essential functions of ecosystems such as primary forests and wetlands. It means accounting for services provided by natural environments, which are not for free goods but must be included in costing economic activities. Nigeria identified marine and coastal environment and freshwater resources as one of its most pressing environmental issues as its project under New Partnership for Africa's Development (NEPAD). Since the discovery of oil in 1958, Nigeria has been suffering its negative environmental consequences of development. The growth of oil industry combined with a rising population and a lack of environmental regulations, led to substantial damage to Nigeria environment, particularly in the creeks and rivers of the Niger Delta. Soil erosion and desertification are serious environmental issues in Nigeria. One of the most visible problems of oil spills has been the loss of mangrove vegetation, once a source of fuel wood for the people and a habitat for the array of biodiversity. The oil spills also had an adverse effect on marine life,

which has become contaminated, in turn having negative consequences for human health from consuming contaminated sea food. Nigeria has lost many of its prime ecosystems, habitats and wild genetic resources, and needs substantial rehabilitation and restoration work carried out before it ever achieves its goals of sustainable development in wildlife and other natural resources.

3.2 Ecosystems:

The word ecosystem is relative term apply to a whole community of organisms and its environment as one unit. Many years ago, ecologist realized that the community could not be separated from the particular environment in which it lived. The physical features of the habitat plus the climatic influences determine which species form the basic structure of the community. Ecosystem consists of the community of organisms plus the associated physical environment. The main features of the abiotic environment; are climate, soil and water status (land, freshwater aquatic or marine); other features include geology, topography and depth below sea level, or the altitude above it. The biotic are mainly the organisms within a community e.g; primary producers, herbivores, consumers and the decomposers. The different types of ecosystems are; terrestrial ecosystems where soils were very important part of the inter-relationships between climate and communities. Soil are composed of mineral particles, including sand and clay, and organic matter, including plant litter and insect droppings. Soil usually has a layered structure caused by the build-up of organic matter on the surface and the effects of water movements which leach the soil and deposit nutrients, humus and clay particles within it. Animal such as worms and termites are important in soil as they mix up the different horizons. In soils where worms are absent the horizons are very pronounced (podzols). Soils are affected by climate (rainfall and temperature) and, to some extent, by the vegetation growing on them. As a result soils are distributed on latitudinal pattern corresponding approximately to vegetation zones. The wetlands and aquatic ecosystems the climate is a less important environmental factor than it is for terrestrial ecosystems.

Wetland ecosystems include mangrove swamps, salt marshes, flooded river valleys, swamps, marshes and bogs. The environment of a wetland habitat depends on the source of its water; sea water is saline, river water is sediment rich, drainage water is nutrient rich and rainfall is nutrient poor. Mangrove swamps and salt marshes are dominated by the influence of tides and by high salt content of the soil and water. Bogs are mainly fed by rainfall and are therefore nutrient poor. Many bog plants augment their nutrient intake by being insectivorous. Aquatic ecosystems include the open sea, ponds, lakes and rivers. Ponds are small but some are ephemeral, drying out occasionally in years of drought or regularly every dry season. Lakes may be fertile (eutrophic) or nutrient poor (oligotrophic). Also, lakes may become stratified in summer due to the heating of the surface waters. As debris sinks and decays, the bottom waters especially in eutrophic lakes, can become anoxic and nutrient rich while the surface waters become nutrient poor. The effect of water is predominant and all important in determining the type of wetland aquatic ecosystem.

3.3 Tropical Rainforest The tropical rainforest has the greatest diversity of communities of species in the terrestrial habitat. Individual plant species are widely scattered and competing for light and space as they develop and grow to fill available spaces.

3.3.1 Forest plants Different species of plants are found in the tropical rainforest than in any other terrestrial biomes. As a result of the size and density of trees, plants have evolved adaptive features that make them survive in the environment. Some of these features are;

(i).Roots system: The trees in the tropical forest have big and wide buttress root that penetrate deep into the soil.

(ii).Sunlight: Emergent trees have direct access to the sunlight, while the submerged are usually slender and straight with little or no branches. Branches only emerge at the top which allow plants to have adequate heat energy for photosynthesis.

(iii).Leaves: Each group of plants has adaptive feature that aids photosynthesis. Plants that grow under the canopy of other trees have broad leaves with few layers of mesophyl cells for photosynthesis.

(iv) . Parasitic plants: Parasitic plants are very common in the rainforest. These plants possess efficient root system that can penetrate the soil and compete for nutrient from the host plant for growth. Also, they could also store up water for respiration.

(v).Litter fall: Litter fall is the process whereby deciduous trees and shrubs drop their leaves during the long dry season in order to preserve water during transpiration.

(vi).Epiphytes: Plants that rely on other plants for their nutritional requirement. They have special adaptation for storing water and equally absorb moisture from the air.

3.3.2 Animal that lives in the Rainforest: The tropical rainforest have different animals. The forest provides enough shrubs and herbs as food as well as good habitat. The sea animals help in dispensing fruits and seeds in forest. The warm environment and less heat provide attraction to numerous exothermic animals, reptiles and other cold blooded animals. Some of the forest animals are as follows;

(i).Mammals: Most of the animals in the forest are tree dwellers and the big ones that live on the land. Those that live on the trees includes; chimpanzee, monkeys, gorillas, bats and different varieties of birds. The big animals are; elephant, Lion, fox, bush pig, dicker, hyena, antelope, tiger etc

(ii).Reptiles: These include; snakes, lizards, tortoise, salamanders etc.

(ii). Birds: These are; woodpeckers, wood owls, guinea fowls, and other species of smaller birds which serve as food for the inhabitants of the forest.

4.0 Conclusion

Growing awareness of the intricate relationship between living organisms and environment has stimulated interest in ecology as a guide to resource management in the last few years. In view of the increasing demands for multiple use of the forest resource for wood production, watersheds, flood control, recreation, wildlife habitat etc, various land users find that a fundamental knowledge of ecology is essential for sound management.

5.0 Summary

In order to clarify the rationale for employing total forest vegetation studies as a base for forest resource management, a word or two aspects of the nature of vegetation might be useful; the role of vegetation in the ecosystem, and; vegetation classifiable continuum. If an ecosystem is regarded as an organism-environment complex through which energy and some nutrients flow, and within which most nutrients cycle, then the role of green vegetation in a forest ecosystem is essentially to facilitate ecosystem function. No other component does this.

6.0 Tutor Marked Assignment (TMA)

- a) What are the principles of sustainable management?
- b) Name five wild animals that live in the tropical forest? What are the adaptive features exhibited by these animals to survive in their habitat.

7.0 References/Further reading

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Watt, K.E.F. 1966. Systems analysis in Ecology, Academic press, New York.

Unit 2 Forestry and Wildlife

Introduction

Wildlife depends on vegetation for its existence. The type of plant formation and its stage in ecological succession determine the species and number of animals which can occupy a habitat. Such species as Apes, Lion , Tiger moose, elk, black tailed deer, white-tailed deer , fox, cougar, lynx and beaver are most often found in the early deciduous tree and shrubs phases of a natural forest succession. In the sub-climax and climax stages, these animals occur mainly along the forest's edge, where the mature climax forest joins parkland, alpine, grassland, or openings, such as rivers, lakes, swamps, fields, and recently logged areas. These species make only intermittent use of the dense climax forest, remaining there during rest and breeding periods, and retreating there for protection against their enemies.

2.0 Objective

At the end of the class student must be familiar with the interrelationship between forestry and wildlife. Also, must be able to explain the importance of vegetation on wildlife management and how it determines the habitat of wildlife resources.

3.0 Main content

- 3.1 Influences of forestry on wildlife
- 3.2 Influences of wildlife on forestry
- 3.3 Wildlife damage to forest trees
- 3.4 Control of wildlife damaging forest crops

3.1 Influences of forestry on wildlife

The interrelationship of the plant and animal communities outlined below means that their respective management must be closely coordinated. Forestry practices exert well defined effects on wildlife. These effects can be beneficial or detrimental. The beneficial effects are as follows;

(i) Logging creates environment suitable for those species whose habitat is formed by the early succession.

(ii) Clearing for roads, camps

and so on creates more living space for species that frequent the forest's edge.

(iii). Reforestation speeds up the creation of protective, dense shelter which is essential for many species.

(iv). Fire prevention preserves forests and also preserves the environment of the wildlife.

(v). Construction of new roads in the forest open up areas which are not accessible before and this lead to the development of a big game.

The detrimental effects are as follows;

- (i). Logging removes the habitat of forest dwelling animals.
- (ii). Forest practices which cause excessive run - off water or result in soil destruction, can creates barren of vegetation and wildlife.
- (iii). Reforestation hastens the decline of wildlife that thrives on cut-over land.
- (iv). Control of lightning-caused fires may reduce the natural creation of game ranges.
- (v). Construction of new access road into remote areas may disturb breeding grounds of waterfowl or promote destruction of species such as wolf, bear etc frequently considered undesirable by the general public.

3.2 Influences of wildlife on forestry

These may be of considerable importance to the forester. The examples of beneficial influences include;

- (i). Predatory wildlife, such as hawks, owls, foxes, wolves and cougars, help to control populations of seed eating rodents and birds as well as ungulates browsing on desired forest regeneration.
- (ii). Birds and rodents help to control populations of tree destroying insects, and may eat the seeds of undesirable “weed” trees.
- (iii). Rodents, by stem girdling, and large ungulates, such as deer, elk, and moose, by browsing, may prevent the growth of weed trees.

(iv). Beaver control and maintain water levels, and may remove “weed” trees.

However, some of the detrimental effects exerted by wildlife on forestry are;

(i). Grouse may feed on the buds of young desirable trees.

(ii). Birds, rodents and large ungulates may destroy the seeds of, or prevent growth of desirable tree species. In addition, large ungulates may compact and trample the site.

(iii). Beaver may flood trees and roads and remove desirable trees.

3.3 Wildlife damage to forest trees

Most wildlife damage to forest trees, when it occurs, is confined to local areas where the environment has been improved for wildlife by logging practices. Most species that cause damage prefer pioneer stages of plant succession. Clear cutting and slash burning provide the best means of creating favourable habitat to damaging species. Increased populations of damaging species may create regeneration problems. Control may become necessary and the first step is to properly identify the damaging agent. Some of these wild animals that cause damages to forest trees are as follows;

- i) **Small mammals:** Deer mice (*Peromyscus maniculatus*), red-backed voles (*Clethrionomys ssp.*), field mice (*Microtus spp.*), and chipmunks (*Eutamias spp.*) cause the greatest regeneration losses in British Columbia by eating seeds and seedling. Mice are the most common cause of failure of direct seeding programs. Seedling damage is identified by beaver-like felling just above ground level or snowline. Mice cause extensive damage to young poplar plantations by eating the roots and girdling the stems. Tree squirrels, *Tamiasciurus spp.* May have a serious effect on regeneration seed supply,

- especially in poor seed years by eating cones, developing conelets, buds and bark of advance regeneration and mature trees.
- ii) **Hare and Rabbit:** A considerable economic losses in regeneration up to five years of age is caused by snowshoe hares (*Lepus americanus*) which eat seedlings, young branches, and leaders. Eastern cottontails (*Sylvilagus foridanus*) may cause similar damage in the lower mainland areas only. Hares prefer Douglas-fir, but will also eat ponderosa and longleaf pine. Cottontails will damage any species within its limited range. Damage is identified by branches and terminals clipped off close to the ground by a smooth sliding cut 0.08 inches wide, or bark up to two feet above the ground stripped or gnawed.
- iii) **Porcupines:** These large rodents prefer pine, but will also eat many other conifers. Damage is local, and intensively on a few individual trees rather than extensively on large stands. Damage is most frequent in pine stands close to den sites such as talus slopes or river banks. Damage occurs to branches in the crowns of saplings and older trees, and is identified by extensive gnawing and bark stripping, which often leaves a ragged appearance. Large amounts of bark and foliage are littered about beneath the tree. To marks are 0.1 to 0.2 inches wide.
- iv) **Deer:** Browsing damage to young regeneration by black-tailed or mule deer, is very significant on the coastal and south central portion of the British Columbia. Deer prefer young red cedar, but will also damage young pine and poplar plantations. Damage is caused by eating seedlings, needles and branch terminals up to 0.25 inch in diameter, or evidence of antler rubbing on stems. Damage may be up to seven feet from ground level.

By and large, damage to plants and most importantly the consumption of the plants would seriously reduce the quantity of seed available for regeneration in all but the best seed years. This is in excess of the quantity that is normally sown during artificial regeneration. Therefore, the best means of reducing the amount of seed that is consumed during artificial seeding operations is to colour the seed prior to sowing, with aluminum flakes or powdered pigment.

3.4 Control of wildlife damaging forest crops

Before control is attempted, the economic losses by damaging species must be weighed against the cost and permanence of the control and benefits derived from control. Most direct controls are short-lived and have to be applied annually until the tree grows beyond the reach of the damaging agent. Other factors such as aesthetics value of the wildlife, protection of a wildlife species by law, encouragement of natural predators and more liberalized hunting should be considered. Problems in forestry arise from improved environment for damaging agents after logging, and complete eradication of the species is difficult, expensive and usually impossible, success of the control should be evaluated by the reduction in damage, and not by the number of animals destroyed. The various methods use to control wildlife damaging the forest crops include;

- i) **Biological control:** The methods may be initially more expensive, but benefits are much more permanent. This form of control is achieved by increasing the environmental resistance by changing the vegetation or encouraging natural enemies. Vegetation is most readily changed by modifying regeneration practices. In areas of high seed losses, midwinter seeding is better than spring seeding, and planting instead of seeding improves regeneration success. Seedlings therefore have a better chance to becoming established and are able to grow before wildlife populations increase in the newly created favourable environment.

- ii) Direct control: Hunting and trapping are useful methods in reducing numbers of bear, porcupine and beaver. Big game hunting seldom provides adequate control of deer, elk or moose, but may assist in preventing large numbers of building up initially if longer seasons and greater bag limits are allowed. These increases will bring about higher recreational values and economic returns in areas overpopulated with browsing species.
- iii) Chemical control is one of the fastest methods of direct control but require repeated application. Chemicals can either be poisons which kill the wildlife species or repellents which are offensive but do not kill.
 - a) Repellents: Most repellents are contact types applied as foliar sprays to stems and leaves of seedlings or saplings to prevent animal browsing or clipping. TMTD (tetramethylthiuram disulphide) and ZAC (Zinc dimethyldithiocarbamate cyclophyxylamine) are widely used contact repellents for protection against small mammals and deer. TNB-A (Trinitrobenzeneaniline) is successful in repelling deer, hares and rodents but it slightly phytotoxic.
 - b) Poisons: Many areas are baited with poisoned cereal grains before sowing with coniferous seed. Strychnine, compound 1080 (sodium fluoroacetate) and thallos sulphate are the most commonly used contact poisons. However extreme caution must be used, as they will cause secondary poisoning in other wildlife and livestock. Because of non- selectivity, secondary poisoning hazards required repeated treatments and cost of treating adjacent areas again small mammal immigrations, repellents are more desirable chemicals. The prolific and immigrational nature of small mammals often negates any momentary benefits of poisoning.

4.0 Conclusion: A significant proportion of wildlife resources in the tropical ecosystem is now under either endangered or under threat of extinction. The threat may come from loss of natural habitat; loss of species and sub-species; invasion by alien species; over hunting or harvesting of natural resources and lack of knowledge of good sustainable management of the environment. Logging, diseases, bush clearing and agricultural development also account for considerable loss of biodiversity.

5.0 Summary: Insufficient and poorly coordinated research effort on wildlife species, habitat and ecosystem management, high rate of population growth, coupled with competition for space among different groups of land users and types of farming are some of the problems facing wildlife management on a sustainable basis.

6.0 Tutor Marked Assignment (TMA):

- (i). Name six (6) wild animals that lives in the forest and in the desert? Give their botanical names and their means of adaptation in their habitat.
- (ii). Differentiate between habitat and ecosystem? What are the factors that affect the habitat?
- (iii). What is ecological management? What the problems of ecological management.

7.0 References/Further reading:

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Module 1 Unit 3

1.0 Introduction: Population Dynamics

2.0 Objectives:

3.0 Main contents

3.1 Population Dynamics

3.2 Biotic potentials

3.3 Ecological disturbances

3.4 Ecological succession

4.0 Conclusion

5.0 Summary

6.0 Tutor Marked Assignment (TMA)

7.0 Reference/Further reading

3.1 Population Dynamics

Every wild animal species has a more or less definite geographic range within the expanse of a species range, not necessarily over the whole areas there are concentrated smaller areas to which the species is ecologically best adjusted. These smaller areas are composed of plant pattern or

habitat preferred by the species. Within a given habitat, there is a large variety of factors and influences which determine the number of animals present at a given time. These factors include climate, the land water ratio, the stage in plant succession, available food, the space required per animal, the number of species present, the biotic potential of each species and the environmental resistance to each species.

3.2 Biotic potentials

The biotic potential of a species has been defined as the inherent ability of an organism to reproduce itself and survive, that is, the maximum rate of increase. Biotic potentials depend on the number of offspring produced in each litter, the gestation period, and the sex ratio of the species. Although the biotic potential is only one of the factors which determine total population, it sets the upper limits of the rate of increase for a particular species.

3.3 Biotic factors

These are the factors that directly have impact or connected with living things or human life. They include; Prey predation relationship, parasitism, competition, diseases, food, territorial control, natality and death. For example, predation is the condition in which an animal engage in the killing of another and eats such animal as food. Prey predation relationship is a system whereby a powerful animal engage in the killing of other less powerful animals for food. For example, lion kills less powerful animals such as antelope, zebra etc for food. Also, hawks and snakes on other animals such as rodents, mouse, toads and other small rodents. Availability of food is an essential material for survival in any living organisms. Shortage of food supply or non-availability can be limiting population growth of organisms in the habitat. Disease infection with a population may be contagious, affecting humans, animals or plants. Disease spread in any habitat may cause mass death if the source of the illness is not quickly arrested and protected. It can

also affect reproductive ability and reduce the population level. There are some plants and animals that live on or in another animal or plant of different type and feed on the host. They compete with the host's for nutritional requirements and sometimes may have adverse effect of draining the body fluid of the host to its detriment. Some parasites are pathogenic (disease causing agent) others may cause serious damage to major organs of the body and consequently kill the host. The results of parasitic infection are reduction and buoyant activities, dormancy, diseases and death and reduce host population. Also, competition within a given population may arise if there is insufficient food or other essential minerals or nutrients needed by the body growth, health and sustenance of life. Severe scarcity of this materials lead to unhealthy competition within the population. As a result, the weak gives way to the strong either through weakness or combat for survival. Territorial control is commonly practiced by man and other higher animals.

3.3 Ecological disturbances Understanding how disturbances such as insects, diseases, and fire naturally function to affect vegetation structure and composition in forest, grassland, and shrubland ecosystems. Vegetation is not static and unchanging; it can be altered in many ways. A large number of factors can influence vegetation changes; some of these are due to human interference, catastrophic events or the effects of seasonality and are not part of succession which is a natural phenomenon. Soil changes due to soil erosion, leaching or the deposition of silts and clays can alter the nutrient content and water relationships in the ecosystem. Catastrophic factors such are part of sudden natural disaster that causes many such catastrophic factors include drought, flooding, bush fires and volcanic effect such as volcanic gas, ashes or larva which may wipe out a larger population in any area, including human beings. When catastrophic factors set in, great changes or modifications of the population may be affected.

3.4 Ecological succession Changes in community composition and structure are most apparent after some disturbances such as fires, hurricanes and floods. Certain species flourish immediately after the disturbance, then, they are replaced by other species, which in turn are also replaced by others. Succession changes can be influenced by site conditions, interaction of the species present and by some factors such as availability of colonists or seeds, or weather conditions at the time of disturbance. Some of these factors contribute to predictability of succession dynamics. These ecological successions have negative effects on the population of the wild animals.

4.0 Conclusion: An over view of sustainable management of the ecosystem, ecological disturbance and the extent, frequency intensity, natural and human factor, types and competition that take place in the ecosystem. Define the terms biotic and abiotic components of the ecosystem.

5.0 Summary: Ecosystem consists of the community of organisms plus the associated physical environment. The main features of abiotic environment are; climate, soil and water status (land, fresh water aquatic or marine).The biotic are mainly the organisms within a community e.g primary producers which are the green plants, while the herbivores are the herbivorous animal which feeds on the green plants, and the carnivorous animal are the carnivores that feeds on the herbivores e.g Lion, Tiger, Hyena and so on. The main constrain to plant growth and development apart from water is availability of mineral elements which must be available to plant in a require proportion.

6.0 Tutor Marked Assignments (TMA):

(i). Define the term sustainable management? What are the advantages and disadvantages of sustainable management?

(ii). Differentiate between ecological succession and ecological degradation

(iii) Define the following terms (a) Parasitism (b) Predator (c) Prey (c) Competition (d) Symbiosis.

7.0 References/Further reading:

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MODDULE 2:

UNIT 1: Wildlife Diseases

Introduction:

Wildlife, domestic animals and humans share a large and increasing number of infectious diseases known as zoonoses. The continued globalization of society, human population growth, and associated landscape changes further enhances the interface between wildlife, domestic animals, and humans, thereby facilitating additional infectious disease emergence. The wildlife component of this triad has received inadequate focus in the past to effectively protect human health as evidenced by such contemporary disease as SARS, Lyme disease, west Nile Fever, and a host of other emerging diseases. Further, habitat loss and other factors associated with human-induced landscape changes have reduced past ability for many wildlife populations to overcome losses due to various causes. This disease emergence and resurgence has reached unprecedented importance for the sustainability of desired population levels for many wildlife populations and for the long-term survival of some species.

Practically, individuals of any wildlife population are hosts to numerous parasites. But when a game population is small, the proportions and the detrimental effects of parasites and subsequent disease are kept in check by the health and developed immunity of the individual host. Some of the individuals may become seriously infested, but if they have little contact with the rest of the population, the parasites and disease present will have little chance of becoming significant to the population as a whole. As the density of game populations increases, there are several sets of factors which automatically pave the way for serious parasite-disease outbreaks:

- i. Disaster conditions in the environment, such as malnutrition due to food storage, exposure due to inadequate shelter, and excessive drought or rainfall.

- ii. Abnormal crowding, reducing the individual's resistance and increasing the probability of parasite transmission.
- iii. Inadequate predation causing crowding.
- iv. Contact with domestic livestock, introducing new diseases or parasites for which wildlife may have neither immunity nor resistance.

Now, let us examine various diseases of wildlife which are of importance in their conservation and management. The diseases could be the one cause by; bacterial, fungal, virus or parasites.

Under bacterial disease, we have;

Avian cholera, Avian tuberculosis, Salmonellosis, Chlamydiosis, Mycoplasmosis etc.

Viral diseases include; Duck plaque, Avian pox, Newcastle disease, Avian influenza, woodcock Reo virus, rabies etc.

Parasitic diseases includes; hemosporidiosis, trichomoniasis, intestinal coccidiosis, renal coccidiosis, sarcocystis, eustrongylidosis, tracheal worms etc.

Let us discuss some of this wildlife diseases in details; their causes, what are the symptoms and their importance in their conservation and management.

1. **Anthrax:** A highly contagious disease of domestic and wild animals as well as of humans. Animals usually die suddenly without symptoms of illness. There is however, an effective vaccine to prevent the disease. The correct handling of affected carcasses will also prevent the spread of the disease.

Causes: Caused by the bacterium *Bacillus anthracis*. Animals that die of this disease must be properly disposed. When the carcasses are cut open, the resistant spores are released which can survive in the soil for many years.

Symptoms: Bloody discharge from the nostrils, mouth and anus, as well as skin are some of the symptoms and also important in spreading of the disease.

2. **Rabies:** Viral disease that can affect most warm blooded animals. It is inherently fatal.

Causes: It is caused by a *Lyssavirus* genus of the *Rhabdoviridae* family.

Symptoms: Aggressive behavior of the animal infected.

3. **Brucellosis:** A very contagious disease

2.0 Objective:

At the end of the class student must be familiar with the various diseases of wildlife and their causative organisms. Also, be familiar with symptoms and effective vaccine to prevent diseases.

3.0 Main content

3.1 Parasites and Disease

3.1 Parasites and Disease

Practically all of the individuals of any wildlife population are host to numerous parasites. But when a game population is small, the proportions and detrimental effects of parasites and subsequent disease are kept in check by the health and developed immunity of the individual host. Some of the individuals may be seriously infested, but if they have little contact with the rest of the population, the parasites and disease present will have little chance of becoming significant to the population as a whole. As the game population's increases, there are several sets of factors which automatically pave way for serious parasite-disease outbreaks:

- i) Disaster conditions in the environment, such as malnutrition due to food shortage, exposure due to inadequate shelter, and excessive drought or rainfall.

- ii) Abnormal crowding reducing the individual's resistance and increasing the probability of parasite transmission.
- iii) Inadequate predation causing overcrowding.
- iv) Contact with domestic livestock, introducing new diseases or parasites for which wildlife may have neither immunity nor tolerance

4.0 Conclusion

Wildlife is affected by various diseases which are caused by different pathogenic organisms. These diseases could be caused by; bacterial, fungal, virus or parasites. Also, some of these wild animals play an important role in spreading of diseases. The infection is usually acquired by drinking contaminated water, grazing on contaminated pastures or when animals lick contaminated skins, bones, blood and carcasses.

5.0 Summary

As the population exceeds the optimum density, it becomes more susceptible to parasites and diseases which further weakened the immunity of various wildlife diseases in the game. Also, predators find their task easier. When both prey and predator populations are low or not in healthy condition, predators act to remove diseased, crippled, or otherwise unhealthy members of the prey species, that is, they maintain high quality in prey populations.

6.0 Tutor Marked Assignment (TMA)

- i) Explain the causative agent of five (5) wildlife diseases?
- ii) How will you control a named disease outbreak in a game reserve?

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MODULE 3

UNIT 1: Wildlife in Nigeria

1.0 Introduction:

In Nigerian, we have forests and woodlands therefore, a wide varieties of wide life. The country is home to biodiversity and vegetation in the region range from rainforests to savanna grasslands. Nigeria is bordered by the sahara desert in the north. The wood lands and forests in Nigeria consist of wide species of mammals, birds and reptiles. There are about 290 species of mammals and 940 species of birds in Nigeria. The regions near Calabar and Cross River state have the world's largest variety of butterflies. Nigeria wildlife is also famous in the southwestern part of the country. The forests in Nigeria are mostly tropical and savanna type. The forests are home to diverse mammals, reptiles and birds. Some species of animals are endangered and the government and various wildlife agencies are making efforts to conserve them. Some important species of wildlife in Nigeria are; Wild cat, Africa lions, Leopards, Banded mongoose ,Common genet, African Givet , White tailed mongoose, African bush elephant, Pangolins, Bats, Hippo potamus, Antelopes. There are also numerous birds and reptiles which form a major section of Nigeria wildlife. They are found in the rainforests and the grasslands. Some important species of birds in the forests of Nigeria are; Ostrich, Pelicans, Frigate birds, Wood peckers, Horn bills, Owls, Broad bills King fisher, Species, of reptiles in Nigeria are; Lizards, Snakes, Crocodiles.

Apart from this animal, there are also plenty of fishes and aquatic animals in the rivers and lakes of Nigeria. Also, Nigeria is reputed to have 22,080 species of animals out of which 274 are mammals the eighth highest in Africa. Of these two species are endemic, the white throated guenon (*Cercopithecus erythrogaster*) and Sclaters guenon, (*Cercopithecus sclateri*), are both endangered. Nigeria also ranks eighth in the world for primate diversity, with 23 species and 13 genera. Some typical examples include the drill or forest baboon, (*Papio leucophaeus*) and the

chimpanzee, (*Pan troglodytes*) which are both endangered and only surviving populations in Cross River and Gashaka-Gumti National Parks and some left over fragments of forests like Ngelnyaki in Taraba state. The lowland or Cross River gorilla, (*Gorilla gorilla*) is endangered and restricted to three forested sites in its range-Cross River National Park's Okwangwo Division, and Mbe Mountains in Nigeria and Takamanda Forest Reserve in Cameroon. The manatee, (*Trichechus senegalensis*) is almost extinct in Nigeria. The country has 904 species of birds recorded. Parts of two endemic Bird Areas occur in the country, Cameroon and Gabon lowlands and the Cameroon highlands, a small extent of each of which reaches the south eastern corner of Nigeria. Two species birds are endemic to Nigeria; the Anambra waxbill (*Estrada polioporeia*) and the Ibadan Malimbe (*Malimbe ibadanensis*), which is endangered. In the reptilian realm, Nigeria boasts of 56 species of forest snakes, one of which (*Mehelya egbensis*) which is endemic and about 58 species of savanna snakes. There are 19 species of amphibians, 5 of which are endemic to Nigeria and Cameroon but experts believe these are underestimates.

2.0 Objective: At the end of the class student must be familiar with the various wild animals found in Nigeria. Also understand that Nigeria's rural populations depend on agriculture for their livelihoods, eking out living on typically small farms, many of which are expanding into previously remote forested areas. This has caused pronounced expansion in Nigeria causing habitat fragmentation and inevitable wildlife conflicts. Therefore, conservation efforts in Nigeria must be re-emphasized and focused on consolidating and protecting habitats. For example, the lush Afi and Mbe mountain chains which link Nigeria Cross River National Park with the Takamanda-Mone Forest in neighboring Cameroon must be adequately protected.

3.0 Main Content:

3.1 An Overview of wildlife in Nigeria

3.2 A Threatened Resource

3.3 Conservation Efforts

3.4 Wildlife Values and Priority on Forest Land

3.5 Problems

3.1 An Overview wildlife in Nigeria:

Nigeria is in forefront in signing many international agreements and conventions crucial to its environmental protection and conservation. For example, Agenda 21 adopted at the United Nations conference on Environment and Development (Rio de Janeiro 1992), the Convention on Biodiversity Conservation (CBC), Climate Change-Kyoto Protocol Convention to Combat Desertification (CCD) and so on.

However, while Nigeria has ratified some of these agreements it is yet to do so for quite a number of the recent ones. Being signatory to these convention are significant enough for any country to indicate its commitment to the welfare of its environment although Nigeria is yet to demonstrate convincingly that its implementing these agreements with the seriousness they deserve. Poor or non-implementation of any of these agreements should be a matter of grave concern to everybody. Presently the country is faced with debilitating problems of soil degradation and erosion, rapid deforestation, urban air and water pollution, desertification, oil pollution of water, air and soil especially in the Niger Delta, loss of arable land and rapid urbanization. All these are matters important to the survival of wildlife resources and the development of ecological tourism or ecotourism. These environmental problems also portend serious challenges to our nation's sustainable development as signed under the Millennium Summit 2000 and the world Summit on Sustainable Development, Johannesburg 2002. As majority of Nigerians depend on natural resources for food, fibre and medicine, their well-being is directly affected by the deteriorating biodiversity situation in the country.

3.2A Threatened Resource:

Unfortunately, these enormous wildlife resources in Nigeria have been allowed to waste by every succeeding government since the mid 1970s, through acts of negligence or omission. A significant proportion of Nigeria's wildlife resources is now either endangered or under threat of extinction. The threat mainly come from loss of natural habitat; loss of species and sub-species; invasion by alien species; over-hunting or harvesting of natural resources and lack of recognition of indigenous knowledge and property rights. Logging and bush clearing account for considerable loss of biodiversity. Recent estimates show that some 6,000 species of fauna are considered to be threatened with extinction or extinct from the wild in Nigeria either because their habitats are being destroyed , they are being over-exploited, they are declining in numbers, or they are simply very restricted in distribution range. Some 0.4% of plants species is recorded as threatened and 8.5% are endangered. Among the animal species, 0.14% is threatened and 0.22% is endangered. Among those globally considered threatened and documented in the World Conservation Union (IUCN)'s Red List, Nigeria has 148 animal species and 146 plant species. Of these, 26 animal species and 18 plant species are classified as endangered and another 3 animal species and 15 plant species are critically endangered worldwide.

3.3 Conservation Efforts:

Nigeria has about 31 game reserves, 5 sanctuaries and 7 National Parks. The game reserves and sanctuaries, owned and managed by the state Governments have specific objectives to protect endangered species, promote sustainable harvest, and promote conservation education and tourism. The National Parks and Strict Nature reserves, developed and managed by the Federal Government under the exclusive legislative list, are to enhance the protection of endangered species, promote scientific research, encourage educational knowledge and promote ecotourism. Sadly, the prevailing reality is that with the exception of the National Parks, most other protected areas exist only in the statute books. The game reserves and game sanctuaries lack any protection, day

to day management or managers and some game reserves exist only on paper. They have been illegally de-reserved and turned into fuel wood exploitation sites, farms or grazing sites for domestic animals. The legislation and control of wild resources outside of protected areas, including those on private lands also fall under the jurisdiction of State authorities. Up to the late 1970s this responsibility was carried out well through careful administrative controls such as the issuance of hunting licenses and disposal permits by state Forestry services. Unfortunately this routine wildlife conservation and management practice effectively ceased to exist from the mid 1980s. The game reserves that survived in to the 1990s did so because of the moral and financial intervention provided by Non-Governmental Organization (NGO) like Nigerian Conservation Foundation (NCF) and savannah Conservation (formerly Yankari Initiative). In 1987, J. S. Ash and R. E. Sharland while assessing bird conservation priorities in Nigeria, saw and noted the considerable deterioration that had taken place in so many areas and concluded that “ time has run out”. Urgent and immediately action is required to salvage what little remains.

3.4 Wildlife Values and Priority on Forest Land:

Increasing demand for recreation and aesthetic values of wildlife are one channel through which foresters can gain public co-operation and recognition of private forest management. Private forest land owners and holders of long term tenures on forested lands have no objections to public use of their lands for sport hunting, fishing, or camping. What they do object to is destruction of their equipment or carelessness with fire. In areas where deer browsing is a problem, forest owners would like to see increased deer hunting, but many are not willing to risk the increased fire hazard or vandalism. Wildlife managers would like to extend hunting seasons and bag limits on areas which are over stocked with game species, but often the general public feels, mistakenly, that more liberalized hunting regulations would deplete their source of recreation. What is needed is closer communication between foresters, wildlife managers and users of the wildlife re-

source in order that maximum economic returns can be realized from forested lands. Better mutual understanding and co-operation is therefore the first step towards multiple use and the maximization of economic returns. Wildlife values on good forest sites may be comparable with the value of timber, but if wildlife interests clash with timber interests, the later must take priority. However, these clashes are seldom insoluble, and the economic returns from any forested land can be increased by also utilizing the wildlife crops.

3.5 Problems of wildlife conservation:

Wildlife management problems in Nigeria are centered principally on around the following situations;

- i). Lack of a well balanced land use planning and haphazard land exploitation and development.
- ii). A high rate of population growth, couple with competition for space among different groups of land users and types of use crop farming, livestock grazing, mining, ranching, fishing and protected area management.
- iii). Over-hunting of game resources by subsistence and commercial hunters as well as by elite weekend-hunters and communal hunters. There are no more reliable records or data on number of hunters in Nigeria because (a) issuance and regulation of hunting licenses is no longer in practice in most states, (b) states no longer carry out wildlife management and control activities; (c) lack of enforcement of wildlife laws in general.
- iv). Gross transformation of all the ecological zones from the mangrove swamps through the rainforest belt up to the sahel savannah through non-sustainable exploitation of resources, causing wildlife habitat loss.
- v). Insufficient and poorly coordinated research effort on wildlife at species, habitat and ecosystem levels, which from the 1990s has totally ceased due to poor funding. The level of coordination and collaboration particularly among the key institutions responsible for wildlife management or research such as the National Park Service, the Forestry Research Institute, other rele-

vant research institutes, the universities and colleges offering wildlife management courses leaves little or not much up to date information for conservation or development.

vi). Unmitigated threat by global climate change and its consequences particularly to wetland ecosystems that include desiccation, intense harvesting of wetland resources including migratory birds, draining of wetland resources including migratory birds, draining of wetlands for crop farming.

vii). Total lack of funding wildlife conservation from Local, State up to the Federal level, the budgetary processes and allocation of funds especially at the state and local government levels have become exceedingly unreliable.

viii). Lack of sufficient effectively trained wildlife personnel in all categories at all Levels of governance. Similar fate afflicts the training institutions at certificate, diploma and degree levels due to poor funding and lack of qualified instructors and lecturers creating a vicious cycle.

ix). Lack of a nationality planned, articulated and sustained conservation education and public awareness campaign on conservation and its peculiar.

Unit 2: Ecotourism

1.0 Introduction:

Ecotourism or nature tourism can essentially be defined as quality tourism as opposed to mass tourism. In principle, ecotourism is environmentally and culturally sensitive, educational, and locally controlled or at least locally beneficial tourist activities focusing on nature study and the environment. Thus, host communities would see the economic value of preserving resources and biodiversity.

2.0 Objective:

At the end of the class, student must be familiar with concept of ecotourism not only in Nigeria but in the rest of Africa. Also, must have fully understood that ecotourism is means of revenue generation for the country.

2.0 Main content:

2.1 Ecotourism in Africa

2.2 Prospects in Ecotourism in Nigeria

2.3 Constraints to Ecotourism

3.1 Ecotourism in Africa:

In Africa, the main product for ecotourism is its wildlife resources. Africa wildlife has long fascinated foreigners and wildlife remains one of the most popular forms of tourism on the continent. Ecotourism is an important source of revenue for countries such as Kenya, Tanzania, Uganda, Namibia, Botswana, Zimbabwe, Zambia, Malawi, and South Africa. Uniquely in these countries, private operator conduct visitors through national parks or game reserves and provide lodging in lodges or luxury tent camps developed usually close to but outside the boundaries of the parks or reserves. There are also guided outings for hunters in game reserves, who pay for the trophies they take, but most tourists visit national parks and take only photographs. Because of the keen attention to conservation and good management, both the publicly run parks and private companies in South Africa guarantee a sighting of the big five, that is, the Lions, Elephants, Rhinoceros, Leopard and Buffalos. The revenue generated from tourism has made the survival of endangered species a high priority for the governments of the countries mentioned earlier. In Kenya, for example, a single lion is worth an estimated \$7000 per year in tourist income, while an elephant herd worth \$610,000 annually. Hunting of both species in Kenya is legal only with a permit. Some countries adopted wildlife management programmed that appeal to local communities, support for conservation, by giving them participatory role in the planning processes and a share of the profits from tourism. In Zimbabwe, for example, the communal Areas Management programmed for Indigenous Resources (CAMPFIRE) gives farming communities in elephant hunting areas a portion of the trophy fees paid by foreign hunters. Each area sets an annual limit on the number of animals that can be legally killed as part of sustainable approach to manage-

ment. Among other things, the communities can be use the money to fence their fields, thus protecting them from elephant damage. In return, the communities look out for the local elephant populations by maintaining watering holes during the dry season and discouraging poaching. In Nigeria, however, the opportunity to develop wildlife-oriented tourism was missed in the mid-1960s, while the country was essentially an agrarian nation with abundant wildlife resources. This is a period when East Africa (Kenya, Tanzania and Uganda) was developing rapidly as a wildlife-tourism destination, and absorbed much of the available market. Unlike the Nigerian experience, the East African Travel and Tourism Association were created during the colonial period to promote East African attractions. Nigeria lost this opportunity first due to the civil War of 1967- 1970 and then the favourable oil prices after 1973. The oil boom altered the nature of the Nigerian economy, and the petrol-dollars prompted rapid urbanization, industrialization and rural disinvestment. It also began the advent of an aggressively mercantile society, exhibiting mismanagement, general insecurity and corruption on an unprecedented scale. The naira was highly overvalued as currency and this did not favour tourism as tourists had to pay more to visit Nigeria compared to other African destinations. Also the constant take-over of government by the Military also contributed to Nigeria's poor image as a potential tourist destination from 1970's up to the 1990's.

3.2 Prospects in Ecotourism in Nigeria

The important questions that readily come to mind are, does Nigeria have prospects for ecotourism development and if so, what are the challenges? The answer is both yes and no, but it all depends on how committed future governments will be to environmental conservation in general and protected area management in particular. Nigeria must also show some seriousness in the pursuit of the goals of sustainable development because ecotourism is non-consumptive sustainable utilization of wildlife. Indeed had successive governments at the centre maintain the zeal and direction the country had taken in the 1980's in formulating the National Conservation Strat-

egy, establishing the Natural Resources Conservation Council (NARESCON) and subsequently the National Parks system, things would have been positively different today, if subsequent government had supported these initiatives by adequate and sustained funding. Nigeria's could have been a success story in conservation and ecotourism development. Further, the country would have effectively embraced the necessary culture of conservation and ecotourism down to the ordinary individual citizen. By now, local and state governments, corporate citizens and individuals would have accepted the idea that conservation of natural resources provides consumptive as well as non-consumptive benefits under sustainable management. The result would have been the proliferation of successful private game ranches and wildlife farms that participate in ecotourism ventures in the country. Unfortunately, NARESCON was disbanded and merged with the Federal Environmental Protection Agency (FEPA) after only 5 years or so of existence. The emergence of an enlarged FEPA, created through the amalgamation of more other units from a diverse assortment of Federal Ministries did not help matters as the new super agency became unruly, power drunk and unworkable. The National Park Service which maintained its autonomy did so at a great cost to itself as it suffered from lack of adequate funding. The ever looming threat of merger with one Ministry or the other just because it has some tourism content has not helped matters either. In all these, the main issues regarding the mandates or missions of both NARESCON and the National Park Service were totally ignored. The National Park Service suffered and intensity of its initial activities and focus could not be maintained. Sadly therefore, ecotourism may not take off in a meaningful way any time soon in Nigeria because of all these policy flip-flops. Successive governments have not only refused to build on to the conservation foundation laid by those before them but they are also continuously neglecting to invest meaningfully in protected areas with wildlife potentials. Similarly the agencies that oversee wildlife conservation at local level, state and federal levels now barely survive with salary payments. Therefore the situation is such even if Nigeria suddenly starts adequate funding of wildlife con-

servation, it would take some time regain lost ground. Nigeria must start on a deliberate policy and strategy of wildlife rehabilitation, regeneration and restoration throughout the country. It must also overcome some fundamental constraints before ecotourism flourishes in these shores. These include mainly the issue of security of life and property, infrastructure, proper orientation, transportation and skilled manpower. These constraints are significant to the effective development of nature-based tourism because of the peculiarity of destinations. Basically, most suitable destinations for ecotourism in Nigeria are in the remote rural areas, often- poorly developed and lacking in basic infrastructure such as good roads, lodging.

3.4 Constraints to Ecotourism

Nigeria lacks well maintained and effectively networked roads, railways waterways and air-links. Infrastructures such as roads, communication lines, etc, in the rural areas are unreliable and not well developed. A case in point is Gashaka-Gumit, the nation's largest (6731sq.Km) and most spectacular National Park whose popularization as a tourist spot has been hampered by poor road linkage, lack of communication, lack of communication, lack of air connection, poor banking facilities, lodgings, etc. Similar situation prevails for almost all National Parks and nature reserves in Nigeria. Constraints to ecotourism can be examined on the followings;

- i) Poor Orientation:** Investment in ecotourism is a long term venture and Nigeria generally is not keen on long term investment because of poor orientation. The lack of awareness in the benefits of conservation and its relevance to everyday life has also hindered right policy orientation. Development practitioners do not see the need to achieve conservation objective or investment in ecotourism as necessarily part of fiscal planning. Nigeria therefore lacks certain official incentives that other developing countries like Malaysia employ to encourage their entrepreneurs to invest in tourism. Ordinary Nigerians do not see wildlife and other natural resources national assets to

be prudently nurtured or invested on. Wildlife is merely bush meat free for the taken in whatever manner. The generally poor attitude to the treatment of visitors by both the official and non official sectors also remains a problem. Nigeria's point of entry is not exactly the friendliest in the world. Our ports of entry seem perpetually disorganized and impersonal. The legions of touts that are permanent feature of our airports are a menace even to fellow countrymen. Generally, the taxi operators who the average tourist in Kenya or Tanzania takes for granted as friend, are on the contrary not so in Nigeria. The lack the basic knowledge of the trade unlike in most other popular destinations. Immigration and Custom officials do not make visitors to Nigeria feel comfortable, neither do the Police. The attitude to visitors in some Nigeria hotels also remains much to be desired as hotel workers can be rude and very unreliable. These, put together are signs of lack of national orientation.

ii) Skilled Manpower:

Inadequate skilled manpower to move the industry forwards is one of the problem impeding the development of ecotourism in Nigeria. In most of the existing destinations, lack of professionals has resulted in substandard services and wastage of resources. To manage and provide effective services in nature-based destinations, skilled and experienced personnel are required. Also, there is the need for personnel of all categories who experienced and exposed to successful circumstances in related settings outside the country may be necessary to set and maintain a competitive edge. This is required to meet basic international standards in the industry. A brief survey of training institutions offering wildlife management, tourism and catering services in the country, Nigeria lacks well-equipped training facilities for personnel of all categories such as park protection, management, interpretation, guide, catering and culinary services, etc, in wildlife management or tourism.

iii) Transportation System:

Transportation is very important to successful tourism practice. Tourists need to travel to a selected destination not only in a good time as the case may be but must be comfortable. A coordinated and efficient transport system is therefore basic and very important for any viable tourism development. Nigeria's transport services remain poorly organized and highly unreliable in sequence as well as charges. Without an effective workable transport policy, Nigeria cannot expect to have a viable tourism industry.

iv) Security:

Tourism is particularly sensitive and susceptible to the state of a nation's security. The term "security" here implies to everything that affects a tourist's well being, i.e physical, mental, and his personal belongings. The type of reception he receives at the hotel and the quality of the roads and highways as well as what happens while he is en route to his destination helps to assure him of not only safety but a worthwhile visit. Through the various official and unofficial processes at the port of entry and to the hotel, the tourist goes through some mentally torturing experience unimaginable. Then, armed robbers could strike or tricksters may trail him to the hotel. Indeed, stories of attack on foreign tourists by armed bandits is featured every now and then in our newspaper and in the internet. Tourists have, thus lost money and travel documents to tricksters and robbers in hotels and on the road. The security implications of such stories can be of concern to tourists. Under such climate of fear and insecurity, only the very hardened tourists can be encouraged to visit Nigeria.

Nigeria requires fundamental changes in its delivery on security, in national orientation and in the development and maintenance of infrastructure. Government must also change its attitude and do something to improve the quality of service providers. The

development of tourism requires by a deliberate policy of fiscal planning that provides incentives for capital investment in tourism ventures such as lodges, equipment, manpower training, etc. In this era of internet when communication is literally unregulated, Nigeria must cultivate and encourage the development of tour operation by the private sector. Tour operators must advertise and popularize the country as a creditable destination and win tourists for Nigeria rather than wait for tourists to come. Generally there must be fundamental changes to society before tourism-based investors will show much enthusiasm in Nigeria.

4.0 Conclusion:

Nigeria might be blessed with a rich and unique array of ecosystems and great variety of wildlife, but the conservation of these resources remains precarious. Not only is Nigeria squandering away its wildlife resources through poor controls and lack of enforcement to the laws and regulations on conservation, it is also inadvertently acting as a big conduit for smuggled wildlife trophies such as skins of leopards, cheetahs, royal python and ivory and live animals, including endangered species such as ostrich chicks and baby elephants, from as far away as the Central African Republic, the Congos, Sudan, Chad and Cameroon.

5.0 Summary:

Nigeria has a rich invertebrate fauna and also an estimated 1489 species of microorganisms. Thus, whether Nigeria's biodiversity is assessed in term of ecosystem diversity, species diversity or genetic diversity, all three criteria being inextricably linked but are not necessarily synonymous, Nigeria is still considered a rich country. In 1960, Frederick Whitehead was so overwhelmed by the variety and numbers of wildlife species in Nigeria that he exhorted Nigeria to be proud of their country, especially in view of its great variations in climate and topography, attributes that are important for the successful development of ecotourism.

6.0 Tutor Marked Assignment (TMA)

- (i) Describe the characteristics of tropical rain forests? List five (5) wild animals found in Nigeria forest.
- (ii) What are the problems of wildlife in Nigeria? Describe how these problems can be addressed.

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Unit 3: Tourism Potentials of some Protected Areas in Nigeria

1.0 Introduction:

Nigeria is the most populous black nation in the world and is one of the poor nations of the world. She is blessed with abundant human and natural resources scattered at different locations in the country. There are diverse species of flora and fauna resources in the land. The tourist potentials are among the best in the world. In spite of the great tourist potentials of Nigeria, her tourist industry is still undeveloped. The continuous fluctuation in oil prices has compelled the Federal Government of Nigeria to start looking for other sources of revenue such as tourism. The major National Parks and game reserves in Nigeria shall be examine.

2.0 Objective

At the end of this class student must be familiar with tourist potentials of Nigeria. Also, familiar with different National parks and many game reserves scattered at different ecological region of Nigeria. Moreover, zoological gardens exist in almost every state in Nigeria and those states not having now, are making efforts at having one. Some of the eco-tourist sites in Nigeria are; Yankari Game Reserve, Kainji Lake Natural Park, Okumu National Park, Obudu Cattle Ranch, Old Oyo Natural Park, Ikogosi Water Spring and so on.

3.0 Main Content

3.1 Yankari National Park

3.2 Old Oyo National Park

3.3 Kainji National Park

3.1 Yankari National Park

Yankari National park is one of the most popular national parks in Nigeria. It lies within the Sudan savanna Zone of West Africa. The 950mm Isochyet passes through the reserve. Temperature and rainfall are moderate except in August when there is a heavy rainfall. It is richly blessed with different species of wildlife. The climate is very good thereby presenting a good environment for tourist. The Sudan savanna vegetation of the park enhances a good game view both during the dry season and wet season. In the dry season, large numbers of animals are found converging at the Gaji valley in the park hence, game view is also enhanced at this point. In fact, the park could support ten times the population of some of the species of mammals found in the park as at now. The Gaji valley serves as a feeding point for a variety of herbivores especially large mammals like elephant, antelope and hartebeest during the dry season. Poaching is the major limiting factor against the multiplication of large mammals. For instance, hippopotamus, warthog, buffalo and all species of ungulate are under serious poaching pressure and this is apparently causing their decline every year. However, Elephant is not as poached as the other animals probably because of inadequate weapon for these illegal operations. Apart from the wildlife species in Yankari, it is also visited for its warm spring. This attracts many local and international tourists. This is one of the reasons why Yankari National Park is one of the most visited parks in Nigeria. Huge sum of money is realized from gate fees, catering, lodging and feeding by the tourist. They also buy souvenirs and pay for taxis and local guides when necessary. However, the revenue accruing from the park can be increased if there is adequate publicity. The revenue accruing from the park is still far below what is obtained from other National parks of its standard in other parts of the world.

2.1 Old Oyo National Park

Old Oyo National Park is richly blessed with abundant wildlife species. Studies have revealed the presence of many amphibians, reptiles, mammals and birds of different regions of

the park. Game view is enhanced more in the dry season because of the reduction in the large concentration of animals around the Ogun river bounds which is often known for abundant nutritive grasses and browse plants for animals to consume. The park is also known for its archeological features from the ruins of the former Oyo Empire which occupied the present site of the park. Hence, many of these archaeological features have been preserved and many can still be sighted at different points in the park.

2.2 Kainji National Park

Kainji National Park was established in 1976 and promulgated into law in 1976. Kainji National Park is well planned and has international recognition. It has an area of 5,340.82km. It is located between Latitude $9^{\circ} 40'$ North and Longitude $30^{\circ} 30'$ west and Longitude $50^{\circ} 50'$ East between the guinea and Sudan Savanna zones. It is located at the boundary between the Sudan and Northern Guinea savanna zones. A checklist of animals in the park shows that it is also richly blessed with wildlife species. The endangered animal species decree 2 of 1985 such as elephants, parrots, lions and leopard. This decree has greatly protected some of the endangered species making them to be more available than what operates in other National Parks. The Kainji Dam is equally a tourist centre which attracts visitors from different parts of the world. The dam supplies electricity in Nigeria and to some neighboring countries in West Africa. There are other National Parks in Nigeria, namely Cross River, and Lake Chad. There are about 36 games reserves at different ecological zones in the country. The Oban division of the Cross River National Park lies in the loop of the Cross River at the south east corner of Nigeria and has it border with Cameroon and it covers an area of about 3000km². It is contiguous with Korup National Park in the Cameroon Republic. The rain forest which is a refuge to many species of plant and animals that escape the ecological disaster during the drastic periods of cool and dry climatic conditions of the pleistocene era or glacier epoch. As

a result, this area forms a rich ecological community that harbors species of high conservation value.

4.0 Conclusion

The much needed economic empowerment in Nigeria does not depend on petroleum resources only. Petroleum is a nonrenewable resource which could be depleted with time. The tourist industry of Nigeria can be greatly enhanced if natural resources are conserved. Accordingly, there must be a rational utilization of the natural resource. There must be less destruction of the forests and rational utilization of the natural resource. Deforestation should be discouraged so that wildlife habitat will be adequately protected.

5.0 Summary

Summarily, government should improve its policy on conservation. The ministry of environment should encourage people to conserve their environment especially those area of primeval importance. Also, the government should fund research and projects on conservation of Nigerian biodiversity. Also, education is a very important project; therefore, government should provide scholarships and incentive to students in biodiversity conservation, based courses in the universities.

6.0 Tutor Marked Assignment (TMA)

- a. Distinguish between renewable and non-renewable natural resources? Name five examples of renewable and non –renewable natural resources.
- b. What is the importance of natural resources to the national economy?
- c. Define ecotourism? What are the constraints of ecotourism in Nigeria?

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Unit 4: Ecotourism and Economic Empowerment in Nigeria

1.0 Introduction

Ecotourism or nature tourism can essentially be defined as quality tourism as opposed to mass tourism. In principle, ecotourism is environmental and culturally sensitive, educational, and locally controlled sensitive, educational, and locally controlled-or at least locally beneficial tourist activities focusing on nature study and the environment. Thus, host communities would see the economic value of preserving resources and biodiversity. In Africa, the main product for ecotourism is its wildlife resources. African wildlife has long fascinated foreigners and wildlife remains one of the most popular forms of tourism on the continent. Ecotourism is an important source of revenue for countries such as Kenya, Tanzania, Uganda, Namibia, Botswana, Zimbabwe, Zambia and South Africa.

2.0 Objective

At the end of the class student must be familiar with the principle of ecotourism and conservation of renewable natural resources in Nigeria. Also, must be familiar with eco-touristic resources in Nigeria. That is, abundant diverse natural resources that provide good platform for the promotion and development of eco-tourism.

3.0 Main Content

3.1 Definition and Features of Eco-tourism

3.2 Ecotourism and Economic Empowerment in Nigeria

3.3 Eco-touristic Resources in Nigeria

3.1 Definition and Features of Eco-tourism

Eco-tourism is a compound word coined from two words-ecosystem and tourism. The term eco-tourism was coined by Hector Ceballos-Lascurain in 1983, and was initially used to describe nature-based travel to relatively undisturbed areas with an emphasis on education. He defined eco-tourism as “environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy and appreciate nature (and any accompanying cultural features-both past and present) that promotes conservation, has low negative visitor impact, and provides for beneficially active socio-economic involvement of local populations” (Ceballos-Lascurain 1996). Eco-tourism is viewed as temporary short-term movement of people to destination outside the places where they normally live and work and involves those activities during their stay in those destinations (countryside). Such movements of people could be international in nature and they are usually leisure based. It could also be motivated by physical relaxation, cultural, interpersonal recreation, holiday, health study, business, religion and sports. Also, eco-tourism is viewed as a type of tourism that involves travelling to relatively undisrupted natural area with the aim admiring, studying, studying and enjoying the scenery and its wild plants and animals as well as any cultural features found there. Eco-tourism involves appreciating the beauty of nature and their values through game watching or viewing, cruising on rivers/lakes, nature walk, sightseeing and scientific research. Ecotourism has the following advantages; it minimizes environmental impacts using benchmarks, improves contribution to local sustainable development and sustains the well-being of local people. It conserves natural and cultural heritage, supports efforts to conserve the environment, contributes to bio-diversity and requires lowest possible consumption of non-renewable resources. The concept has, however, developed to a scientifically based approach to the planning, management and development of sustainable tourism products and activities. It is an enlightening, participatory travel experience to environments, both natural and cultural, that

ensures the sustainable use, at an appropriate level, of environmental resources. While producing viable economic opportunities for the tourism industry and host communities, eco-tourism makes the use of these resources through conservation beneficial to all tourism role players. It is not a marketing ploy, nor is it scenic or nature- based travel. It is an approach that creates a variety of quality tourism products that is; environmentally and ecologically sustainable, economically viable, and socially and psychologically acceptable. The result of which

reflects integrated and holistic approach to product development, capacity building in host communities, a sense and uniqueness of place and commitment to the greening of the tourism industry. As a development tool, ecotourism advances the three basic goals of the Convention of Biological Diversity.

- i) Conserve biological (and cultural) diversity, by strengthening protected area management systems (public or private) and increasing the value of sound ecosystems.
- ii) Promote the sustainable use of bio-diversity, by generating income, jobs and business opportunities in ecotourism and related business networks, and
- iii) Share the benefits of ecotourism developments equitably with local communities and indigenous people, by obtaining their informed consent and full participation in planning and management of ecotourism business.

Eco-tourism focuses on local cultures, wilderness adventures, volunteering, personal growth and learning new ways to live on our vulnerable planet. It is typically defined as a travel to destinations where the flora, fauna, and cultural heritage are the primary attractions. Responsible ecotourism includes programs that minimize the adverse effects of traditional tourism on the natural environment, and enhance the cultural integrity of local people. Historical, biological and cultural conservation, preservation, sustainable development etc, are some of the fields closely related to eco-tourism. In most cases, eco-tourism normally involves visits to

natural and parks and game reserves to see animals and plants in their natural habitats. Usually, these animals are strictly restricted from being killed and trees are not allowed to be destroyed in order not to disturb the ecosystem. In most cases, eco-tourism normally involves visits to natural parks and game reserves to see animals and plants in their natural habitats. Usually, these animals are strictly restricted from being killed and trees are not allowed to be destroyed in order not to disturb the ecosystem. Essentially, ecotourism is non destructive and thus supports the conservation of nature (flora and fauna) thereby reinforcing the concept of sustainable natural resources management and it is widely believe to be the perfect economic activity to promote both sustainability and development. Ecotourism is one of the main issues of natural resources management, the principle of which is how tourist can truly gain knowledge from their visit to natural and cultural area without causing a negative impact on the environment.

3.2 Ecotourism and Economic Empowerment in Nigeria

The importance of ecotourism to the economic empowerment of Nigeria cannot be overemphasized. The potentials of ecotourism to economic empowerment of Nigeria are as follows;

- i) Employment opportunity for the masses.
- ii) It is a good source of revenue from both local and international tourists. The volume of revenue generation could be as high as possible depending on the strategies and planning techniques of the government. This is why countries which plan their ecotourism programmes well obtain as much revenue as possible from it.
- iii) It provides education for the tourist. It is generally established that apart from recreation, ecotourism is a good source of both former and informer education. It provides field studies for many aspects of biology and biochemistry. Right now, many research pro-

jects are in progress in the various eco-tourists centre of Nigeria and other parts of the world.

- iv) It has been established that tourism reduces stress and anxiety. It prevents high blood pressure and other cardiovascular diseases. Therefore, it promotes productivity of every individual thereby; making him or her fit enough to contribute to the Gross Domestic Products (GDP) of his country.
- v) Ecotourism provides one of the best forms of recreation in the world. It takes the tourists to the undisturbed natural entity of the earth environment. The tourists are taken to the fundamentals of nature in its natural form. It completely different form the artificial form of tourism which is available in the towns and cities. The natural harmony with its unique quietness. It enables the tourists to see the various biodiversity components which are made up of flora and fauna species that are endemic to the area. This endears the curiosity of the tourists worldwide.

3.3. Eco-touristic Resources in Nigeria

Some of the various eco-tourist sites in Nigeria are shown in the table below

Serial/No	Eco-tourist Attraction	State of Location
1.	Yankari Game Reserve	Bauchi
2.	Kainji Lake National Park	Niger
3.	Okumu National Park	Edo
4.	Cross River National Park	Cross River State
5.	Obudu Cattle Ranch	Cross River State
6.	Old Oyo National Park	Oyo

7.	Gashaka Gumti National Park	Taraba
8.	Chad Basin National Park	Yobe
9.	Kamuku National Park	Kaduna
10.	Ikogosi Water Spring	Ekiti
11.	Olumo Rock	Ogun
12.	Oshun Shrine (groove)	Osun
13.	Jos Plateau	Plateau
14.	Oguta Lake Resort	Imo
15.	Ogbunike Cave	Anambra
16.	Erin-ijesha Water fall	Osun

Many of the famous natural parks in Nigeria contain animals like, Lions, leopards, tigers, elephants, rhinoceros, hippo, giraffes, and variety of antelopes and birds. These animals are the major attractions to the tourists. Also, some of the popular animals available in our parks and games reserves are as follows.

Serial/No	Common Name	Biological Name
1.	Gorrilla	<i>Gorrilla, gorilla</i>
2.	Forest baboon	<i>Paio, leucopha</i>
3.	Chimpanze	<i>Pan trog lodgtes</i>
4.	Montain reed buck	<i>Reduna fidvoru fula</i>
5.	Dama gazelle	<i>gazelle dama</i>
6.	Dorcas gazelle	<i>Gazella dorcas</i>
7.	Manatee	<i>Trichectus senegatenses</i>
8.	White- throated guenom	<i>Cercopithecus erythrogaster</i>
9.	Sctaters guenon	<i>Ceropithecus sclateri</i>

- | | | |
|-----|------------------|-----------------------------|
| 10. | Anambra wax bill | <i>Estrilda poloipareia</i> |
| 11. | Ibadan malmabe | <i>Malimbus ibadanensis</i> |

4.0 Conclusion

The development of our eco-touristic resources should be a thing of serious concern to the government in view of our dwindling and unpredictable revenue from oil, which is the main source of revenue to it. There is no doubt about it that if this sector of the economy is fully developed the multiplier effects will be such that will be such that will transform the entire country.

5.0 Summary

Eco-tourism must do more than create a series of activities to attract visitors. It should offer them an opportunity to interact with nature in such a way as to make it possible to preserve or enhance the special qualities of the site and its flora and fauna, while allowing local inhabitants and future visitors to continue to enjoy these qualities. They must also establish a durable productive base to allow the local inhabitants and eco-tourist service providers to enjoy a sustainable standard of living while offering these services

6.0 Tutor Marked Assignment (TMA)

- i) Discuss the importance of ecotourism in the development of a nation? What the principle of conservation of natural resources.
- ii) Differentiate between renewable and non-renewable natural resources. Mention five each of renewable and non-renewable natural resources. Write short note on them.
- iii) Name the factors affecting development of ecotourism in Nigeria? What the possible solutions for the development of eco-tourism in Nigeria.

7.0References/Further reading

Falade, O. 2000. Understanding Tourism in Nigeria. JIS Printing Press. Ibadan. Pp.171.

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Stephen, W. and John, O. 2002.Ecotourism: Impacts, Potentials and Possibilities. Butterworth, Heinemann, Oxford. Pp. 1-144.

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Unit 5: Community benefits and its impact on wild life conservation

Introduction

The Nigerian approach is popularly referred to as “Support Zone Community Programme (SZCP),” by it the National Park authority provides necessary incentives and benefits to local communities to enlist their interest and participation in wildlife conservation. In spite of this, conservation in Nigeria National Parks is still in crisis as recent field work revealed that Nigerian National Parks are seriously losing their prized animal species due to the activities of poachers and bush burning. Communities approach in sustainable management and conservation of wild-life resources determines the benefits accrue to the people in the communities.

2.0 Objective

At the end of the class student must be familiar with challenges and benefits to the community for participating in wildlife conservation. Essentially, programme to encourage local communities to managed all their resources, including sustainable management of wildlife, with the community benefiting from up to 50 percent and above of the revenues.

3.0 Main Content

3.1 Community benefits and its impact on wildlife conservation

3.2 Threatened Resource

3.1 Community benefits and its impact on wildlife conservation

As a form of incentives to local communities the OONP authority renovates the town hall at Sepeteri and also dug concrete well/borehole at Tede. All this aim at changing the behavior and interest of residents and subsequently transform them into conservationists. An attempt was made to analyze the effects of such investments on residents’ incentives to participate in wildlife

conservation. It was observed that although boreholes and town hall were built or rehabilitated using OONP revenues, the benefits have no influence on local behavior and incentives to participate in wildlife management, nor particularly affected residents' incentives to poach. We hypothesized that people fail to link wildlife conservation and management to social services provision (water and town hall) for two key reasons; first, services does not distinguish those comply with the natural resource management rules from those who do not. Secondly, local communities cannot identify the benefits of provision of water facilities and renovation of town hall with wildlife management since government has traditionally provided these services at no expense of to the community. It is therefore difficult to explain and convince local communities that this provision have made possible because of wildlife conservation when government provides the same or better services to other communities not affected by OONP programme. Communities should certainly wonder why they ought to give up their land for wildlife and tolerate wildlife damage to crops to a service that benefit everyone and whose provision is entirely a government responsibility. Notwithstanding, the foregoing incentives improve the social welfare of rural dweller. For instance provision of one borehole in Tede community, a community of about 60,000 population according to 1991 census figure is grossly inadequate. The outcome of CBC in OONP in terms of its ability to influence community to participate in wildlife conservation confirmed studies by Rutten (2002) and Nelson (2004). In both cases, the implementation of community- based conservation does not adequately address the conservation objectives nor needs community development. During fieldwork similar trend was also observed in Yankari National Park where a ranger was reportedly killed by a poacher, in a attempt to stop him from poaching wildlife despite several incentives made to local communities by park authority.

3.2 Threatened Resource

The enormous wildlife resources have been allowed to waste by every succeeding government since the mid 1970s, through acts of negligence or omission. A significant proportion of Nigeria's wildlife resources are now either endangered or under threat of extinction. The threat mainly come from loss of natural habitat; loss of species and sub-species; invasion by alien species; over-hunting or harvesting of natural resources and lack of recognition of indigenous knowledge and property rights. Logging and bush clearing account for substantial forest loss in Nigeria. Agriculture energy and infrastructure development also account for considerable loss of biodiversity. Recent estimates show that some 6,000 species of fauna are considered to be threatened with extinction or extinct from the wild in Nigeria either because their habitats are being destroyed, they are being over-exploited, they are declining in numbers, or they are simply very restricted I distribution range. Some 0.4 percent of plants species is recorded as threatened and 8.5 percent are endangered. Among the animal species, 0.14 percent is threatened and 0.22% is endangered. Among the globally considered threatened and documented in the World Conservation Union (IUCN, 1988). Of these, 26 animal Species and 15

4.0 Conclusion

It could be generally concluded that there is no conflicts of interest between the adjoining communities and the National Park management except for the damages experienced by the farmers on their crops by wild animals and socio-economic activities of the adjoining monoculture farms which serves as hunting for wild ani-

mals. There is high level of conservation awareness but work has to be done to educate the villagers on the benefits of the National Park so that they can be fully involved in policing the resources.

5.0 Summary

Nigeria is blessed with abundant natural resources with great potential of economic growth and transformation. These natural resources include among others the abundant but fast diminishing forests and wildlife resources. Though, these resources have not been fully harnessed to generate the much needed revenue and raw materials for the economic development of the country and the upliftment of the living standard of the citizenry. However, with community participation in wildlife protection and management the probability of sustainable management will be achieved.

6.0 Tutor Marked Assignment (TMA)

- i) What is community forestry? Describe how community forestry can improve wildlife resources.
- ii) What is the importance of wildlife to the national economy in Nigeria?

7.0 References/Further Reading

- Adeyoju, S.K. 2001. Forestry for National Development: A critique of the Nigerian Situation. In: Forestry and National Development. Proceeding of the 27th Annual Conference of the Forestry Association of Nigeria.
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Module 4: Conservation policies, problems and prospects

Unit 1: Conservation policies

1.0 Introduction

Policy is a direction for development, simply put; policy is a definite course of action adopted for the sake of expediency. It is a course of action adopted and pursued by a government, political party, etc. With respect to wildlife, policy consists of programme of action-short, medium and long terms but basically intended to provide a philosophy for the use wildlife resources to enhance the welfare of the society.

2.0 Objective

At the end of this class, student must be familiar with policies, problems and prospects of wildlife conservation. Also, must understand the general principle of conservation of renewable natural resources.

3.0 Main content

- 3.1) Forest Policy in Nigeria
- 3.2) Conservation policies in Nigeria

3.1. Forest Policies in Nigeria

Forest policy evaluation is critical in minor and major changes in formal public statement and administrative implementation. Forest policy improvement enhances sustainable management and utilization of forest resources. The national forest policy, which included within the document 'Agricultural Policy of Nigeria' published by the Federal Ministry of Agriculture in 1988, has the following objectives (FAN, 1989);

- i) Consolidation and expansion of the forest estate and its management for sustained yield
- ii) Forest conservation and protection of the environment
- iii) Forest regeneration at a greater rate than its exploitation
- iv) Provision of adequate funds at all times for the realization of the policy objectives
- v) Reduction of waste in utilizing of both the forest and forest products
- vi) Protection of the estate from fires, poachers, trespassers and unauthorized grazers
- vii) Encouragement of private forestry
- viii) Creation of man-made forests for specific end uses
- ix) Increase of employment opportunities
- x) Development of national parks and game reserves
- xi) Development of secondary forest products that are significant in the local economies and encouragement of agro-forestry
- xii) Cooperation with other nations in forestry development
- xiii) Development of more efficient use of wood energy and encouragement of use of energy sources alternative to wood fuel

Anybody that reads the above policy objectives would, of course, see them as harbinger to growth and development of forestry sector in Nigeria. However, under Nigeria constitution, forest estate belongs to the state government; each state government enunciates its own policy as it deems fit. The unrelated nature of state forest policies in Nigeria has resulted in confusion and uncoordinated strategies. In a situation of inconsistent and inappropriate forest policies, almost all the objectives laid down in the forest policy are thwarted as well as haphazardly implemented. This shortcoming has negated the potentials of forest as well as wildlife resources which could have generated a lot of income in Nigeria. Whatever policies that affect forestry will have direct effect in sustainable management of wildlife resources.

3.2 Conservation Policies

Over the years, Nigeria has shown increasing concern for the preservation of her indigenous wildlife. The number of game reserves has grown steadily and international cooperation agreements for the protection of wildlife have been signed. A decree to regulate traffic in endangered species was promulgated in 1985 and each of the nineteen states in the Federation has either amended or repealed the 1916 wild Animals Preservation Ordinance. Establishment of the Nigeria Conservation Foundation in 1982 marked the beginning of organized private involvement in the promotion of conservation ethics in the country. Nevertheless the nation's goals of managing wildlife for tourism, sustained cropping of game meat ('bushmeat') and preservation of a national heritage remain hard to press in the face of mounting economic problems and expanding population, and the continuing destruction of wildlife habitat.

4.0 Conclusion

It can generally be stated that there is need for wildlife conservation policy which will sustainable management and protection of wildlife resources. Policy when is enacted, the implementation should be carried out to letter so as to achieve the stated objectives.

5.0 Summary

The country's wildlife faces a rather bleak future because substantial numbers of species are either endangered or threatened with extinction. Indeed a similar fate seems to be the lot of the departments and agencies that see to conservation and management of these local resources at local, state and federal levels.

6.0 Tutor Marked Assignment (TMA)

- i) What is forest policy? How does it affect wildlife resources conservation?
- ii) Explain with examples the meaning of endangered species.

7.0 References/Further reading.

Anadu P.A. 1987. Wildlife Conservation in Nigeria Problem and Strategies Environmental Pollution. 7: 211- 220.

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Unit 2: Problems of wildlife conservation

1.0 Introduction

2.0 The major threats to wildlife in Nigeria are loss of habitat, over hunting and poaching. Poor managed logging and increasing needs for agricultural land are fragmenting Nigeria's remaining forests. Population increase which puts intense pressure on the land resources. Protected areas are becoming more isolated with few resources or qualified staff in place to encourage sustainable management.

2.0 Objective

At the end of the class student must be familiar with the mission statements of wildlife conservation is to conserve nature by sustainable utilization of men material and land, through participatory management, research, education and law enforcement and ensure the maintenance of biodiversity and forest cover.

3.0 Main content

3.1 Threats to tropical wildlife

3.2 Problems of wildlife conservation in Nigeria

3.1 Threats to tropical wildlife

Sustainable development implies development which while protecting the environment, allows a type and level of economic activity that can be sustained into future with minimum damage to people or the environment. During the parts three scores Nigeria has shown increasing concern for the preservation of her indigenous wildlife. The no of game reserves has grown steadily and international cooperation agreements for the protection of wildlife have been signed. A decree to regulate traffic in endangered species was promulgated in 1985 and each of the nineteen states in

the federation has either amended or repealed the 1916 wild animal's preservation ordinance. The establishment of the Nigeria conservation foundation in 1982 marked the beginning of organized private involvement in the promotion of conservation ethics in the country. However, the nations goals of managing wildlife for tourism, sustained cropping and game meat and preservation of a national heritage remain a problem in the face mounting economic problems, over population and the continuing destruction of wildlife habitat.

3.2 Problems of wildlife conservation in Nigeria

Over the years, Nigeria has shown increasing concern for the preservation of her indigenous wildlife. The number of game reserves has grown steadily and international cooperation agreements for the protection of wildlife have been signed. A decree to regulate traffic in endangered species was promulgated in 1985 and each of the nineteen states in the federation has either amended or repealed the 1916 wild Animals Preservation Ordinance. Establishments of the Nigeria Conservation Foundation in 1982 marked the beginning of organized private involvement in the promotion of conservation ethics in the country. Nevertheless, the nations goals of managing wildlife for tourism, sustain cropping of game meat and preservation of a national heritage remain hard pressed. However, poorly managed logging and increasing needs for agricultural land are fragmenting Nigeria's remaining forests population increase which puts intense pressure on the land resources. Protected areas are becoming more isolated, with few resources or qualified staff in place to encourage sustainable management in some areas, the bush meat trade is a pressing threat, as demand increases to supply commercial markets. A general lack of governance and awareness of conservation issues in communities surrounding protected areas also presents a major obstacle- encroachment by the people as well as illegal farms around the forest are some of the challenges facing our wildlife management. Also frequent damage by dry season

forest fires also affects the habitat of the wildlife. Poaching, and revenge killing of those animals that raid crops in farms close to the reserve one of the major problem or wildlife in Nigeria.

4.0 Conclusion

Conservation of wildlife resources should be given highest priority on protecting habitat and sustaining the resource and give the lowest priority to accommodating the needs of the user. Protection of endangered species is a triumph of environmental conservationist.

5.0 Summary

Adequate priority must be given to the conservation of Nigerian biodiversity. Education is very important project; government should provide scholarships and incentive to students in biodiversity conservation, based courses in the universities.

6.0 Tutor Marked Assignment (TMA)

- i) What are the problems of wildlife resources in Nigeria?
- ii) What the solutions to the problems of conservation of wildlife resources?

7.0 Reference/Further reading

- Adeyoju, S.K. 2001. Forestry for National Development: A critique of the Nigerian Situation. In: Forestry and National Development. Proceeding of the 27th Annual Conference of the Forestry Association of Nigeria.
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Module 5: World Wildlife Resources and their Protection

Unit 1 World wildlife resources

1.0 Introduction

The idea of conservation has evolved over time to its present day meaning of managing the earth living resources for the benefit of people and other alive today without threatening the interests of those who will be alive tomorrow. This is linked to the idea of sustainable development which can be described as seeking happiness and prosperity for all in ways that show we intend to stay on earth, rather than to lose it and move on hence, the concepts of protected areas. Protected areas are cornerstone of many conservation approaches, and concepts of pristineness and wilderness are often considered central to protected area designation and management. Wildlife and biodiversity conservation provided a (pos-hoc) scientific and ethical rationalization of both wilderness and “wise use” approaches to protected area designation and management, again reaffirming the need and rationale for protected areas.

2.0 Objectives

At the end of the module students should be familiar with the world wildlife resources and their protection. Also understand their habitat and effects of continuous destruction of the habitat. The distribution, abundance, trend and fragmentation of species and their conservation must be understood. The key factors that limit species and place them at risk must be familiar with.

3.0 Main content

3.1 Wildlife and biodiversity conservation

3.2 World wildlife resources

3.3 Protections of world wildlife resources

3.1 Wildlife and biodiversity conservation

Over time, the conservation rationale for protected designation and management shifted from landscape, scenery and natural resources, to preservation of wildlife and biodiversity. This change in focus resulted from an interest in protecting animals for their own sakes, and for preserving species for science and for potential and actual benefits in terms of genetic resources and ecosystem services. Initially, wildlife conservation was deeply entwined with humane and ethical concerns for animals, though in recent decades the “Animal Right Movement” has become somewhat separated from conservation, while scientific approaches to conservation have focused on concerns over biodiversity loss.

By the 1850s, humanitarian concerns for the welfare of the poor extended demand for ethical treatment of animals (Western and Wright). The Humane movement developed in response to excessive hunting, cruel treatment of animals and the over-exploitation of animals and birds for their fur, feathers and tusks. (Other branches of the human movement were concern with animal experiments and the meat industry, but these issues are less relevant to the development of protected area conservation so will not be explored here.) By 1869, John Stuart Mill responded to public sensibilities and advocated the preservation and ethical treatment of species for their own sake, independent of their utility for humans (Western and Wright 1994).

According to Weddell (2002), wildlife at first was used to refer to game species; later it came to mean terrestrial vertebrates. In current usage, the term wildlife often denotes all forms of wild organisms, including animals, plants and microorganisms. “Wildlife” is now to some extent used interchangeably with biodiversity a term that became common in the scientific literature from 1986, the following a National Forum on Biodiversity held in Washington, D.C. It originated as

shorthand for biological diversity and is currently the scientist preferred term for wildlife and nature (Sarkar 1999). The term became very popular with the arrival of the 1992 Convention on Biological Diversity (CBD), which defined biodiversity as;

“ The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems”. The objectives of CBD are “the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources” (Secretariat of 2001). Biodiversity conservation thus incorporates elements of the philosophy of the wise use movement, as well as a focus on conserving species and ecosystems for their intrinsic and scientific value.

3.2 World wildlife resources

The world wildlife resources include both the fauna, flora and some wild plants scattered all over the world. In some countries e.g Republic of Botswana have laws to protect their wildlife and other resources. For example, Relics and Antiquities Act,1970 a controversy which contributed to the community’s decision to form its own trust so as to gain greater control over land and resources of the region. Kalahari savanna ecosystem supports a diverse array of wild animal species, from elephants (*Loxodonta africana*) to bush squirrels (*Paraxerus cepapi*) . Nearly all of the major antelope species common to southern Africa are found there, as is full range of large and small predators. The bird populations are also significant both scientifically and in terms of subsistence. There are pans (shallow lakes) on both sides of the border, especially on the Namibian side, that provide stopover points for migrating waterfowl, some of which are very rare. At least nine species of birds are hunted for food, including guinea fowl (*Numida meleagris*) and francolin (*Francolinus adspersus*) .

Also, in the past there were efforts made by local people to encourage the growth of desirable plant species by burning the bush. Some people referred to this strategy as “Bushman plowing”. People also used fire to get rid of ticks and other pests that caused difficulties for themselves and for wild and domestic animals. People in this area also engaged in transplanting desirable plant species such as morama (*Tylosema esculentum*) which produce highly nutritious nuts and roots.

3.3 Protection of world wildlife resources

For more than 45 years, WWF has been protecting the future of nature. The largest multinational conservation organization in the world, WWF works in 100 countries and is supported by 1.2 million members in the United States and close to 5million globally. WWF’s unique way of working combines global reach with a foundation in science, involves action at every level, from local to global, and ensures the delivery of innovative solutions that meet the needs of both people and nature.

Legislation to protect endangered and iconic animals, including leopards, cheetahs and gray wolves, was passed into law in U.S. Also, great cats and rare dogs comprise some of the most endangered species and iconic animals on the planets. By establishing new conservation programmes and creating funding streams to carry out these laws, it will help the wild animals to remain in the wild for generation to come. Conservation programmes for great cats and rare dogs has been a top priority of WWF for several years.

4.0 Conclusion

Simultaneous to the growth of the Wilderness Movement in the U.S. was the advocacy for wise use of natural resources. The idea of limiting or controlling access to natural resources has its origins in many ancient and medieval societies; scared groves and taboos against the killing of certain animals, for example, were early forms of conservation. But in the 19th century, govern-

ments in America, Africa and Asia established legislation limiting access to forest products, game and grazing.

5.0 Summary

Protected areas are cornerstone of many conservation approaches, and concepts of pristineness and wilderness are often considered central to protected area designation and management.

Therefore, protections, conservation and management of wild animals in which killing, hunting and capture of animals and destruction or collection of animals are prohibited.

6.0 Tutored Marked Assignment (TMA)

- a. What do you understand by sustainable management?
- b. What are the principles of sustainable management?

7.0 References/Further reading

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