

## **COURSE GUIDE**

### **EMT 517 FOREST AND WILDLIFE POLICY, LAW AND ADMINISTRATION**

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## INTRODUCTION

**Forest and Wildlife Policy, Law and Administration** are a broad term comprising of two different disciplines namely; Forestry and Wildlife.

Forest Policy could be defined as a plan of actions designed to indicate what proportions of a nation's land area should be allocated or allotted. The Forest Administrative Department is the body responsible for implementation of forest policy and forestry issues in any country. Through norms and legislation, financial means, an information and forest programme, forest policy is designed to promote the sustainable management of forest land resources uses. There are different implementations of state forest administration systems in different countries. For instance, in Europe there are different institutional structures and approaches, variation in legal rights and duties between private and public institutions, and also differences in the share of duties between national and local levels. Hence, forest policy means setting public aims and goals for forestry. It also means choosing, regulating and implementing policy for fulfillment of the aims and goals while monitoring the achievements.

Hence the formulation of forest policy should be an interdisciplinary effort. This is because it could require the contribution of an economist, the forest managers, the town planners, silviculturists, forest pathologists to mention just a few.

The terms that often come up in the context of forest policy are values, interests, and conflicts while the main aim of forest policy is sustainable forest management, for the benefit of people and nature. Thus, Global forest policy has become an increasingly important issue, not only because of global climate change, but also because of growing demand for sustainable energy, consequences of globalization, deforestation in the tropics, illegal timber trade, and poverty in third world countries.

Concept of wildlife management is entrenched in three approaches viz: control of wildlife population; maintenance of wildlife habitat; and management of people to protect wildlife, the most critical of which is the last. To achieve human management in a way that strikes a balance between the needs of man and the requirements of wild species, the promulgation and enforcement of adequate and effective legislation could not be over-emphasized.

Wildlife policy is a legal statement that provides a set of orientations and principles of actions to guide and determine future decisions in relation to conservation and sustainable use of wildlife resources for the benefit of society from the social, economic and ecological viewpoints.

It specifically provides guidance for planning, resource allocation as well as legal reforms related to the wildlife sector. The policy represents the consensus among all relevant stakeholders on wildlife management objectives in the country.

## **COURSE AIM**

The main aim of this course is to increase our understanding of the proper management and wise use of forest and wildlife resources through effective policies, laws and administration.

## **COURSE OBJECTIVES**

To achieve the stated aim above, this course sets to achieve certain specific objectives. Therefore, at the completion of this course, students should be able to:

- explain the roles of policies and laws on conservation of forest and wildlife resources
- describe the benefits of forest and wildlife resources to man
- discuss the challenges to the implementation of forest and wildlife policies
- discuss the roles of different institutions on forest and wildlife policies and laws
- list some anthropogenic activities to the proper management of forest and wildlife areas
- explain the global outlook of forest and wildlife sector

## **WORKING THROUGH THE COURSE**

The course on forestry and wildlife policy, law and administration would require that you spend a lot of time to read and understand it. The content of the material is quite broad and detailed and that is the more reason you must find quality time to study it very well. Indeed, efforts have been made to break down the material into units that you will find it readable and comprehensible. To comprehend the course clearly, earnest effort is required from you to understand the technicalities involved. You are therefore, advised to make sure you attend the tutorial sessions where you can interact with your colleagues and compare notes.

## **COURSE MATERIALS**

In order to understand this course with little stress, you will be provided with the following materials.

- Course Guide and
- Study Units.

In addition, a list of recommended textbooks is given in a section of this Course Guide. Although they are not compulsory for you to acquire them or even read, they are necessary as supplements to the course material. Indeed, your reading some of them may give you a better understanding and make you distinguish yourself.

## **STUDY UNITS**

These are the details of the study units that you will have to go through in this course.

### **Module 1 Forest and Wildlife Resources**

Unit 1	Forest Resources and Man
Unit 2	Forest and Wildlife Conservation
Unit 3	Setbacks of Forest and Wildlife Resources
Unit 4	Benefits of Forest Wildlife Resources
Unit 5	Effects of Global Change on Terrestrial Biosphere

### **Module 2 Forestry and Wildlife Policy, Law and Administration**

Unit 1	Forest Policy and Laws
Unit 2	Wildlife Policy and Laws
Unit 3	Forest Administration
Unit 4	Wildlife Administration
Unit 5	Impact of Forest and Wildlife Policies on the Society

### **Module 3 Challenges to the Implementation of Forest and Wildlife Policy**

Unit 1	Forest Fires
Unit 2	Illegal Hunting
Unit 3	Illegal Grazing/ Logging
Unit 4	Buffer Zones
Unit 5	Conflicts

### **Module 4 Forestry and Wildlife Outlook**

Unit 1	Forest Industries
Unit 2	Wildlife Prospect
Unit 3	Protected Areas
Unit 4	Global View of Forestry Sector
Unit 5	Global Outlook of Wildlife Sector

## **Module 5    Institutions and Their Responsibilities**

Unit 1	Federal Ministry of Environment
Unit 2	Forestry Research Institute of Nigeria
Unit 3	Wildlife Department
Unit 4	Ministry of Agriculture
Unit 5	Universities/ Colleges and Technical Schools

Module 1 focuses on the relationship between man and forest resources. Human activities impacts positively and to a great extent negatively greatly on forest resources which in turn give rise to global warming. It gives you a brief idea of what you are expected to know as you read this material. It is essential for you to know the significance of forest and wildlife resources in our day-to-day life and define how it affects various aspects of our life.

The units provide the vocabulary for describing forest resources, actions and consequences of human activities, a common framework for linking the impact of human activities on the environment.

The first unit of this study material introduces students to the relationship between man and forest resources. The second unit considers forest and wildlife conservation and types of conservation. The third unit describes some of the challenges to forest resources. The fourth unit explains the beneficial roles of forest resources to the society. The final unit explains the effect of global change to forest and wildlife resources.

Module 2 discusses forestry and wildlife policy, law and administration. Definition, formulation and implementation of forest policy and law are discussed in unit 1. Unit 2 focuses on wildlife policy and laws. The third and fourth units' discusses forest and wildlife administration respectively. The fifth unit discusses the impact of forest and wildlife policies and laws on the society.

Module 3 focuses on the challenges to the implementation of forest and wildlife policy. The first unit introduces the students to the effect of forest fires on forest resources and its impact on forest and wildlife policy. The second unit discusses illegal hunting, while the third unit focuses on illegal logging and grazing. The fourth unit explains the effect of Buffer zones and the final unit discusses conflicts as one of the challenge to forest and wildlife policy implementation.

Module 4 describes the outlook of the forestry and wildlife sector. Unit one discusses the forest industries, while unit two explains the wildlife

prospect. The third unit discusses the state of the protected areas. The fourth and final unit discusses the global outlook of forestry and wildlife sector.

Module 5 explains the roles of forest and wildlife institutions. The first unit explains the role of the Federal Ministry of Environment, while the second unit discusses the role of Forestry Research Institute of Nigeria. The third unit explains the role of wildlife department. The fourth role explains the role of the Ministry of Agriculture. The fifth unit focuses on the role of Universities/colleges and Technical Schools.

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## **ASSESSMENTS**

There are two components of assessment for this course. There is the Tutor-Marked Assignment (TMA) while the course examination at the end of the course is the second and final one.

## **TUTOR-MARKED ASSIGNMENT**

The TMA is the continuous assessment component of your course. You need to know that it accounts for 30% of the total score. Normally, you will be given 3 TMAs to answer. You must attempt all of them before you sit for the end of course examination. The TMAs would be given to you by your facilitator and returned to you after they have been graded.

## **End of Course Examination**

The course is concluded by the time you write the end of course examination. It constitutes 70% of the whole course. You will be informed of the time the examination will take place. Note that it may or may not coincide with the university semester examination.

## **SUMMARY**

This course intends to provide you with some foundational knowledge of forestry and wildlife policy, law and administration. By the time you complete the study of this course, you should be able to satisfactorily answer the following questions:

- Discuss the socio-economic importance of forest and wildlife resources
- Discuss in detail the impact of man on forest and wildlife resources
- Explain the various challenges affecting forest and wildlife conservation in Nigeria
- Discuss forest and wildlife conservation
- Explain the different anthropogenic effects on forest and wildlife resources
- Discuss in detail the non-anthropogenic effects on forest and wildlife resources
- Appraise the value and roles of forest and wildlife resources to the growth of Nigerian economy
- Discuss the environmental benefits of forest and wildlife resources to man
- What is terrestrial biosphere and its component
- Explain the effect of global warming on terrestrial ecosystem
- Outline the factors to be considered in making forestry policies and laws
- Explain in detail the tools for formulating forestry laws and policies
- Explain the advantages of an effective wildlife policy in sustainable management of natural resources
- Appraise the role of forest administration
- Discuss in detail the role of the government in forest management
- Discuss the benefit of an efficient wildlife administration to wildlife management
- List and discuss the impact of forest and wildlife policies on the society
- List and discuss in detail the sources of forest fire

- Explain the effect of forest fire on forest and wildlife conservation
- Outline and discuss the reasons for hunting in and around conservation areas
- Explain clearly the effect of illegal grazing and logging on National protected areas
- Discuss the impacts of illegal logging and grazing on wildlife
- Enumerate the benefits of buffer zones
- What is land hunger
- Write out the current status of the forestry industries in Nigeria

I wish you success in this course. In particular, I hope you will be able to appreciate the importance of Forestry and Wildlife Policy, Law and Administration in our day to day activities and in human affairs.

Hope you will enjoy the course

Best wishes.

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**MODULE 1 FOREST AND WILDLIFE RESOURCES**

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**1.0 INTRODUCTION**

Forests are vegetation types or plant formations in which trees are the dominant species. Forest can be seen as plant community, predominantly of trees or other woody vegetation, occupying an extensive area of land. In its natural state, a forest remains in a relatively fixed, self-regulated condition over a long period of time (Adam in Mbalisi & Ugwu, 2012). Forest and wild resources provide materials for utensils and construction, and contribute to improved diets and health, food security, income generation, and genetic experimentation. These resources are typically associated with hunting and gathering societies where they often have special cultural significance, but they also play important roles in more intensive or specialized agricultural systems.

## 2.0 OBJECTIVES

At the end of this unit, you should be able to:

- define forest and wildlife resources
- discuss the influence of man on forest and wildlife resources
- discuss the relationship between forest and wildlife

## 3.0 MAIN CONTENT

### 3.1 Definition of Forest Resources

Forest resources refers to all products from the forest and its values could be quantified in relation to their benefits to man. The benefits include timber and non-timber products such as wildlife, watershed, fruits, nuts, ropes, leaves, barks, rattan, seeds, wax, gums, resins, honey, edible vegetables, herbs, mushrooms, roots, fuelwood and fibre. Non-wood components of forest resources, the shrubs and herbs form significant portions of food supply for both human and wildlife populations. Seed, pulp, wood and leaves of some trees such as *Irvingiagabonensis* and *Parkia biglobosa* are widely used in Nigeria for food, medicine and as inputs in rural industries. Forest resources provide various materials that meet basic human needs such as food, fuel, fiber, shelter and medicine. The abundant forest resources in Nigeria if properly utilized could enhance and compliment agricultural production, thereby making agriculture sustainable. Resources are materials which man uses to satisfy his needs. Forest resources are materials in the forest which aid man to satisfy his needs and shape his destiny. They are grouped into timber and non-timber forest products.

#### 3.1.1 Timber Products

These are woods (both hard and soft) exploited from the forest for cooking and heating, construction of houses, making of furniture, poles, baskets, boards, ply-woods and wood-pulp for making of papers and textiles.

#### 3.1.2 Non-Timber Forest Products (NTFP'S)

These are a wide array of economic or subsistence materials that come from the forest excluding timber. They range from food or food additives (nuts, mushrooms, wild fruits, herbs, spices, aromatic plants); plant materials (fibres, creepers and flowers); plant derivatives (raffia, bamboo, rattan, cork and essential oils); to animals (games, snails and bees); and animal products (honey, silk etc).

### **3.2 Wildlife Resources**

Wildlife means the native animals of a region. Wildlife includes any animal, aquatic, or land vegetation which forms part of any habitat. Thus, the term wildlife effectively encompasses all forms of life, whether plant or animal which are found wild in nature. This would also include marine, freshwater and coastal ecosystems.

### **3.3 Man's influence on Forest Resources**

Human activities on the environment have affected the abundance of forest and wildlife resources either positively or negatively, since man is the sole care-taker of Earth's natural resources. Farming activities in and around the forest, logging, wildfire, illegal grazing, poaching, and buffer zones all which are activities carried by man affects the relative abundance of forest and wildlife resources.

### **3.4 Community Education**

It is a tool for equipping the grass root people with knowledge and skills on every issue that affect their existence.

### **3.5 Linking Forest and Wildlife**

Wildlife has four basic requirements: food, cover, water and space. Different wildlife species require different stages of forest growth to meet these needs. The arrangement and ratio of these stages dictates the kinds of wildlife that can live on forest land. The key to wildlife diversity and abundance is habitat diversity.

## **4.0 CONCLUSION**

The understanding of the relationship between man and forest resources will enable the wise use of forest and wildlife resources for the improvement and development of the economy.

## **5.0 SUMMARY**

In this unit, we have learnt:

- what forest and Wildlife resources involves
- how Man influences Forest and Wildlife Resources
- relationship between forest and wildlife

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the socio-economic importance of forest and wildlife resources
2. Discuss in detail the impact of Man on Forest and wildlife resources

## 7.0 REFERENCES/FURTHER READING

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## UNIT 2 FOREST AND WILDLIFE CONSERVATION

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### 1.0 INTRODUCTION

Human activities have increased the extinction rate by at least 100 times more than the natural rate. The increase in depletion and extinction of the world's biodiversity has led to a much greater interest and attention from the global community to protect the environment and safeguard thousands of species.

### 2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain forest and wildlife Conservation
- discuss the types of Conservation
- explain the challenges to Forest and Wildlife Conservation

### 3.0 MAIN CONTENT

#### 3.1 Forest and Wildlife Conservation

Forest and Wildlife conservation is wise use and the practice of protecting wild plant (Trees) and animal species and their [habitat](#). Forest and Wildlife play an important role in balancing the ecosystem and provides stability to different natural processes of nature. The goal of forest and wildlife conservation is to ensure that nature will be sustained for future generations to enjoy and also to recognize the importance of wildlife and [wilderness](#) for humans and other species alike.

### **3.1.1 In situ Conservation**

In-situ conservation is the conservation of species in their natural habitats, is considered the most appropriate way of conserving biodiversity. Conserving the areas where populations of species exist naturally is an underlying condition for the conservation of biodiversity.

### **3.1.2 Ex situ Conservation**

Ex-situ conservation is the preservation of components of biological diversity outside their natural habitats. This involves conservation of genetic resources, as well as wild and cultivated or species, and draws on a diverse body of techniques and facilities.

## **3.2 Forest and Wildlife Reserves**

Forest reserves are portions of state lands where commercial harvesting of wood products is excluded in order to capture elements of biodiversity that can be missing from sustainably harvested sites. Small (patch) reserves will conserve sensitive, localized resources such as steep slopes, fragile soils, and habitat for certain rare species that benefit from intact forest canopies.

## **3.3 National Parks**

A National park is a large, predominantly unaltered area of land and/or sea characterized by exceptional and varied natural assets, comprising one or several preserved or predominantly unaltered ecosystems, and is primarily set aside for the conservation of original natural assets.

## **3.4 Challenges to Forest/Wildlife Conservation**

The major threats to wildlife in Nigeria are loss of habitat, overhunting, and poaching. Wildlife habitat is being destroyed by logging, farming, exploitation for fuelwood, illegal grazing inside wildlife reserves, industrial plantation of exotic trees, housing and highway development. Hunting is a traditional occupation in Nigeria and because of the high demand for 'bushmeat', trophies and animal parts as ingredients of medicinal and magical concoctions; hunters are assured of a lucrative market.

## **3.5 Judicial Enforcement of Park Legislations**

For effective enforcement of park laws and legislations as well as wildlife laws, judiciary is important. However, respondents have complained that the judiciary appears not to understand the dynamics of

National parks and conservation laws and as such poor adjudication has been prominent even with incontrovertible evidences against the accused.

#### **4.0 CONCLUSION**

The knowledge of forest and wildlife conservation will prove to be invaluable assets not only for the economy growth of the country but most importantly for the preservation of this precious heritage.

#### **5.0 SUMMARY**

In this unit, we have learnt about:

- forest and Wildlife Conservation
- the types of Conservation
- the challenges to Forest and Wildlife Conservation

#### **6.0 TUTOR-MARKED ASSIGNMENT**

1. Explain the various challenges affecting forest and wildlife conservation in Nigeria
2. Discuss Forest and Wildlife conservation
3. List the various National Parks in Nigeria and the Socio-economic benefit

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## **UNIT 3      SETBACKS OF FOREST/WILDLIFE RESOURCES**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Drought
  - 3.2 Flood
  - 3.3 Erosion and Sedimentation
  - 3.4 Deforestation
  - 3.5 Excessive Hunting
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Human beings have seriously encroached into many wildlife habitats and permanently occupied lands formally inhabited by wild animals (Ijeomah and Aiyeloja, 2010). This has led to wanton destruction and emigration of wildlife species (part of our national heritage) to more stable ecosystems. Through creation of wildlife refuges in form of game reserves and national parks rural inhabitants were forced to vacate part of their ‘acquired life – dependent’ land and other part of environment for wildlife species, in many cases without compensation (Adetoro *et al.*, 2011).

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the non-anthropogenic effect on Forest and wildlife resources
- explain the anthropogenic effect on Forest and wildlife resources

### **3.0 MAIN CONTENT**

#### **3.1 Drought**

Prolonged absence of rainfall impacts negatively on forest and wildlife resources. Plants such as shrubs, herbs and trees will lack water which it needs for its growth. This will lead to poor shelter and cover for the wildlife which they need for their survival, therefore necessitating the migration of wildlife.

### **3.2 Flood**

It is commonly believed that forests are necessary to regulate stream flow and reduce runoff, and to some extent this is true. But, in reality, forests tend to be rather extravagant users of water, which is contradictory to earlier thinking (FAO 2003).

### **3.3 Erosion and sedimentation**

It is widely perceived that forests can control erosion and sediment processes. While forest cover does tend to check erosion, it is not the tree canopy that is directly responsible for this; rather it is the undergrowth and forest litter.

### **3.4 Deforestation**

Deforestation is a conventional environmental challenge substantially affecting the resilience and distribution of forests across different boundaries. It is simply defined as the loss of trees' cover usually as a result of forests being cleared for other land uses (Gorte and Sheikh, 2010). In the drier areas of the tropics, fuelwood gathering can be a major cause of deforestation and degradation of the forest (Chakravarty *et al*, 2014).

### **3.5 Excessive Hunting**

According to the International Union for Conservation of Nature (IUCN), 1169 of the world's 4556 assessed terrestrial mammals (approx. 26%) are listed as threatened with extinction. Excessive hunting refers to unregulated hunting that is indiscriminately carried without authorization or with inappropriate hunting equipment.

## **4.0 CONCLUSION**

The setbacks of forest and wildlife resources can be curbed with more education to the local dwellers around the forest or conservation.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- the anthropogenic effects on forest and Wildlife resources
- the non- anthropogenic effects

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the different anthropogenic effect on forest and wildlife resources
2. Discuss in detail the non- anthropogenic effect on forest and wildlife resources

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## **UNIT 4      BENEFITS OF FOREST AND WILDLIFE RESOURCES**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Cultural Benefit
    - 3.1.1 Sacred Groove
    - 3.1.2 Sanctuaries
  - 3.2 Commercial Benefit
  - 3.3 Recreational Benefit
  - 3.4 Flood Control
  - 3.5 Research Purpose
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

In addition to providing people with wood and other plant products for food, construction and income, and ecosystem services such as freshwater, soil protection and climate regulation, forests are also major habitat for wildlife. Wildlife likewise provides both products (e.g honey, bush meat, even edible insects), and ecosystem services (e.g pollination and seed dispersal). On a global scale, the goods and services provided by forest and wildlife resources are worth billions of dollars. Added to this is their cultural and spiritual value which cannot be monetized.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the cultural benefits of forest and wildlife resources
- explain the commercial benefits of forest and wildlife resources
- explain the recreational benefits of forest and wildlife resources

### **3.0 MAIN CONTENT**

#### **3.1 Cultural Benefit**

Cultural benefits refers to the nonmaterial benefits that people obtain from ecosystems through spiritual enrichment, cognitive development,

reflection, recreation and aesthetic experience, including, for example, knowledge systems, social relations, and aesthetic values.

### **3.1.1 Sacred Groove**

Sacred groves are tracts of virgin forest with rich diversity, which have been protected by the local people for centuries for their cultural and religious beliefs and taboos that the deities reside in them and protect the villagers from different calamities. Every sacred grove carries its own legends, lore, and myths which form the integral part of the sacred grove.

### **3.1.2 Sanctuaries**

Sanctuary is an area which is of adequate ecological, faunal, floral, geomorphological, natural or zoological significance. The Sanctuary is declared for the purpose of protecting, propagating or developing wildlife or its environment. Certain rights of people living inside the Sanctuary could be permitted.

## **3.2 Commercial Benefit**

There is strong evidence that as national incomes increase, rates of under-nutrition fall. Income is clearly an important factor contributing to falling global rates of undernutrition (FAO 2012). Forest income contributes about 1/5th of the income of rural households in developing countries.

## **3.3 Recreational Benefit**

The social values of forest recreation deal mainly with intangible benefits such as aesthetic qualities as well as the enhancement of psychological and physical health (e.g. Tyrväinen *et al.*, 2005; Ward Thompson 2007). Forests, especially within or near urban areas, provide aesthetic enjoyment and create a pleasant environment for many outdoor activities. Forest and wildlife together provides recreational activities such as hunting, photography, relaxation, hiking and bird catching.

## **3.4 Flood Control**

It is commonly believed that forests are necessary to regulate stream flow and reduce runoff, and to some extent this is true. But, in reality, forests tend to be rather extravagant users of water, which is contradictory to earlier thinking (FAO 2003). Considerable quantities of rainfall (up to 35 per cent) are commonly intercepted by the canopies of

tropical forests and evaporated back into the atmosphere without contributing to soil water reserves.

### **3.5 Research Purpose**

Forest and wildlife provides an abundant array for study, projects and learning. Till date Man has not fully tapped from the vast varieties of both forest and wildlife resources.

### **4.0 Conclusion**

From the fore going the cultural, commercial, aesthetics, academic and economic benefits of forest and wildlife resources cannot be over-emphasized. Man will continue to depend on these nature reserves.

### **5.0 Summary**

In this unit, we have learnt about:

- the cultural aspect of forest and Wildlife resources
- the commercial aspect of forest and Wildlife resources
- the recreational, environmental as well as the academical aspects of forest and Wildlife resources

### **6.0 TUTOR-MARKED ASSIGNMENT**

1. Appraise the value of forest and wildlife resources to the growth of Nigerian economy
2. Discuss the Environmental benefits of Forest and wildlife resources to Man

### **7.0 REFERENCES/FURTHER READING**

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## **UNIT 5      Effects of Global Change on Terrestrial Biosphere**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Terrestrial Biosphere
  - 3.2 Global Change Effect
  - 3.3 Climate Change
    - 3.3.1 Land and water use change
    - 3.3.2 Habitat changes
    - 3.3.3 Changes in disturbance regimes
  - 3.4 Climate feedbacks
  - 3.5 Policy implications
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Ecosystems provide many products and services that are crucial to human survival (Daily, 1997; UNEP, 1998; WRI, 2000). Ecosystems affect biogeochemical and physical feedbacks to the biosphere and atmosphere, hence are important for the functioning of the Earth's systems. Recent estimates indicate that 25% of the world's mammals and 12% of birds are at significant risk of global extinction. Climate change is only one of a long list of pressures on wildlife. Other pressures include exploitation of animals, pollution and other biochemical poisonings, extreme climatic events, wildlife diseases, collisions with towers and other structures, anthropogenic barriers to dispersal, and war and other civil conflicts. Alone or in combination, these pressures will greatly increase species 'vulnerabilities to rarity and extinction (high confidence).

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain terrestrial biosphere along with its components
- explain the effect of global change on forest and wildlife resources
- explain global warming



## **3.0 MAIN CONTENT**

### **3.1 Terrestrial Biosphere**

Terrestrial ecosystems consist of plants, animals, and soil biota and their environment. The distribution of biota within and across ecosystems is constrained by the physical and chemical conditions of the atmosphere, the availability of nutrients and/or pollutants, and disturbances from natural origin (fire, wind-throw, etc.) or human land use.

### **3.2 Global Change Effect**

Global climate change, for example, affects local weather and climate in ways that are strongly dependent on location. In trying to understand the effects of global change on the biosphere as a whole, scientists often focus on higher level entities such as ecosystems or biomes (the collection of ecosystems within a particular climatic zone with similar structure but differing species—e.g., the temperate forest biome).

### **3.3 Climate Change**

Climate change is the changes in temperature, precipitation, local extreme climatic events, elevated CO<sub>2</sub>, and others.

#### **3.3.1 Land and water use change**

This will lead to increased forest cover for additional fiber and biofuels, recreation, conservation, aquaculture, irrigated agriculture, power production.

#### **3.3.2 Habitat changes**

Through changes in ice cover, water flow, storms, floods, cloudiness.

#### **3.3.3 Changes in disturbance regimes**

This include types, intensity, and frequency for events such as fires, floods, blow downs, insect herbivory, pests.

### **3.4 Climate feedbacks**

These are processes by which climate change influences some property of the Earth system which, in turn, either diminishes or amplifies the change. Diminishing feedbacks are called 'negative' and amplifying feedbacks are called 'positive'.

### 3.5 Policy implications

Biosphere feedbacks influence the relationship between emissions (of CO<sub>2</sub> and other GHGs) and concentrations, which are what determine the greenhouse effect and thus the effect of emissions on climate. Biosphere feedbacks are therefore directly relevant for mitigation policy. Uncertainty about the magnitude of feedbacks is a problem for climate policy because the usefulness of climate projections is limited if the quantitative relationship between emissions and concentrations is unclear. Potentially large positive feedbacks are of particular concern, as positive feedbacks mean that more stringent emissions reductions are required to stabilize climate at any specified level. Moreover, multiple positive feedbacks are mutually reinforcing because of the non-linear relationship between temperature increase and gain. We have attempted to quantify the various feedbacks that have been proposed to be large – thus, those of greatest policy relevance.

### 4.0 CONCLUSION

This unit has broadened our knowledge of the impact of global warming on Earth's biosphere with its negative and positive impact.

### 5.0 SUMMARY

In this unit, we have learnt about:

- terrestrial biosphere
- the effect of global change on forest and wildlife resources
- global warming

### 6.0 TUTOR-MARKED ASSIGNMENT

1. What is Terrestrial biosphere and its component
2. Explain the effect of Global warming on Terrestrial ecosystem

### 7.0 REFERENCES/FURTHER READING

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## **MODULE 2            FOREST AND WILDLIFE POLICY, LAW AND ADMINISTRATION**

Unit 1	Forest Policy and Laws
Unit 2	Wildlife Policy and Laws
Unit 3	Forest Administration
Unit 4	Wildlife Administration
Unit 5	Impact of Forest and Wildlife Policies on the Society

### **UNIT 1            FOREST POLICY AND LAWS**

#### **CONTENTS**

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Forest Policy and Laws
3.2	Factors to be considered
3.3	Strategies
3.4	Forestry Laws
3.5	Tools used in formulating/ Implementing forest policies
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

#### **1.0            INTRODUCTION**

Forest Policy could be defined as a plan of actions designed to indicate what proportion of a Nation's land area should be allocated or allotted. How the areas so dedicated are to be developed and how the products are utilized to the maximum benefit of the public. Simply put, forest policy could be considered as consisting of those principles which govern the actions of the people with respect to forest reserves.

#### **2.0            OBJECTIVES**

At the end of this unit, you should be able to:

- define forest policy and its objectives
- explain in detail the factors to be considered in making forest policies
- explain the tools for formulation or implementation of forest policies

### **3.0 MAIN CONTENT**

#### **3.1 Forest Policy Objectives**

The overall objective of the national forest policy is to achieve sustainable forest management that would ensure sustainable increases in the economic, social and environmental benefits from forests and trees for the present and future generation including the poor and the vulnerable groups. Specifically, the objectives include the need to; increase, maintain and enhance the national forest estate through sound forest management practices, promote and regulate private sector involvement in forest development, and to create a more positive investment climate in the sector, capitalize on the economic, social and environmental opportunities in forestry without undermining the resource base, ensure the survival of forest biodiversity and to balance this with the pressing development needs of the country.

#### **3.2 Factors to be considered**

In making forest policy, the factors that must be considered includes the following; Soil types, desirable species, climatic factors, growth rate of species, silvicultural characteristics, Import & Export Possibilities, pattern of wood consumption, economic development programme and human population and growth rate. So, the formulation of forest policy should be an interdisciplinary effort. This is because it could require the contribution of an economist, the forest managers, the town planners, silviculturists, forest pathologists to mention just a few.

#### **3.3 Strategies**

To achieve sustainable forest management, some of the strategies to be adopted include: the promotion of partnership with all stakeholders including the private sector, communities, and society, NGOs and CBOs, decentralization, promotion of community participation in forest resources management and encouraging the active participation of all women and men, young people and elderly and the vulnerable group in forest resources development.

#### **3.4 Forest Law**

Under the Nigerian legal system, Forest Laws are generally statute laws. These are laws passed by a legislative body, be it under a military government or under a civilian government. The subject of agriculture falls under the concurrent legislative list of the Nigerian Constitution. Consequently, both the Federal and State government are empowered to make laws on agriculture. Forest laws are made based on forest policies.

In actual practice, the bulk of the laws on forest are made by each state government of the federation, taking into cognizance their peculiar geographical features.

### **3.5 Tools used in Implementing/Formulating forest policies**

Public ownership of land, public regulation of private land financial assistance to approved desirable projects, provision of technical assistance, research, education tariffs and trade assistance, forest Protection against fungal, bacterial, fire pests' attacks and land use planning.

### **4.0 CONCLUSION**

The understanding of forest policies and laws will help in the sustainable management of all protected areas whether forest reserves or national parks.

### **5.0 SUMMARY**

In this unit, we have learnt that:

- forest policy is to achieve sustainable forest management
- Some factors must be considered
- both the Federal and State government are empowered to make laws on agriculture

### **6.0 TUTOR-MARKED ASSIGNMENT**

1. Outline the factors to be considered in making forestry policies and laws
2. Explain in detail the tools for formulating forestry laws and policies

### **7.0 REFERENCES AND FURTHER READING**

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## **UNIT 2 WILDLIFE POLICY AND LAWS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Developing a wildlife policy
  - 3.2 Policy Statement
  - 3.3 Strategies
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Concept of wildlife management is entrenched in three approaches *viz*: control of wildlife population; maintenance of wildlife habitat; and management of people to protect wildlife, the most critical of which is the last. To achieve human management in a way that strikes a balance between the needs of man and the requirements of wild species, the promulgation and enforcement of adequate and effective legislation could not be over-emphasized. Wildlife policy is a legal statement that provides a set of orientations and principles of actions to guide and determine future decisions in relation to conservation and sustainable use of wildlife resources for the benefit of society from the social, economic and ecological viewpoints.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- define wildlife policy
- explain the strategies to developing wildlife policy

### **3.0 MAIN CONTENT**

#### **3.1 Developing a wildlife policy**

A policy provides a set of orientations and principles of actions to guide and determine future decisions in relation to the conservation and sustainable use of natural resources for the benefit of society from a social, economic and environmental viewpoint. A wildlife policy specifically provides guidance for planning, resource allocation as well as legal reforms related to the wildlife sector. The policy represents the

consensus among all relevant stakeholders on wildlife management objectives in the country. While the national wildlife authority will most likely lead the process of policy development, the responsibility to undertake activities to reach the identified policy objectives may be allocated to different governmental and non-governmental actors. The national wildlife authority will remain in charge of overseeing that the policy goals are achieved.

### **3.2 Policy Statement**

The nation's rich biodiversity shall be conserved to provide essential goods and services for sustainable development.

### **3.3 Strategies**

Identify, delineate and inventorize species and sites of conservation interest. Develop in-situ conservation areas as National Parks, Game Reserves, Strict Nature Reserves, Sanctuaries and Cultural Heritage Centre's. Develop ex-situ conservation areas – Zoological and Botanical Gardens, which are to serve as centres for genetic improvement of endangered species. Promote Herbarium/Arboretum establishment – support the establishment and development as both national and state priority. Develop transparent mechanisms for responsibility and benefit sharing among Federal, States and Local Governments and Communities and other stakeholders. Enforce forestry legislation including laws on export of flora and fauna. Initiate the development and dissemination of relevant awareness and education materials on biodiversity conservation.

## **4.0 CONCLUSION**

Wildlife policy is a legal statement that provides a set of orientations and principles of actions to guide and determine future decisions in relation to conservation and sustainable use of wildlife resources.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- wildlife policy
- policy statement

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. Explain the advantages of an effective wildlife policy in sustainable management of natural resources



2. Explain the strategies of an effective wildlife policy

## 7.0 REFERENCES/FURTHER READING

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## **UNIT 3                      FOREST ADMINISTRATION**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Forest administrative department
  - 3.2 Challenges of forest administration
  - 3.3 Administration of forest resources
  - 3.4 Forest law enforcement
  - 3.5 Role of Government
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Forest governance structure has been observed to be the same all over Nigeria by Mohammed and Danjuma (2014). Forest administrations in the state are carried out by the Department of Forestry in the Ministry of Environment. In the State, forests are governed centrally from the office of the governor to the Ministries of Environment and the Department of forestry. The effectiveness of a forest policy depends on the energy, drive and dedication of the National Forest Service. In bridging the gap between policy formulation and various agents of implementation in the country, the Federal Department of Forestry shall play a leading role in forest management throughout the country.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the role of forest administration in sustainable forest management
- explain challenges of forest administration
- explain forest law enforcement and penalties

### **3.0 MAIN CONTENT**

#### **3.1 Forest Administrative Department**

This is the body responsible for implementation of forest policy and forestry issues in any country. Through norms and legislation, financial means, an information and forest programme, forest policy is designed

to promote the sustainable management of forest land resources uses. There are different implementations of state forest administration systems in different countries. For instance, in Europe there are different institutional structures and approaches, variation in legal rights and duties between private and public institutions, and also differences in the share of duties between national and local levels.

### **3.2 Challenges of Forest Administration**

In many countries, forest ownership and settlement have become politically explosive, forcing many governments to introduce radical changes in the way forest resources are controlled and managed and, thus, prescribing new roles for Forest Administrations. But many Forest Administrations have yet to fully adjust to such changes and remain sub-optimal in their functions. It is widely recognized that forestry institutions in these countries have weak capacities to fulfill their functions.

### **3.3 Administration of Forest Resources**

Adequacy of staff capacity and effectiveness of agencies tasked with forest administration, quality and effectiveness of information and data management systems adequacy, effectiveness and transparency of monitoring and evaluation and accessibility of results, extent to which monitoring and evaluation results are clearly incorporated into forest management planning, effectiveness of collection, sharing and redistribution of forest taxes, royalties, charges and rents and extent to which on-the-ground management of forests follows adopted policies, laws and plans.

### **3.4 Forest Law Enforcement**

Appropriateness and consistency of application of penalties for breaches of forest laws and regulations, effectiveness of division of jurisdictional authority and responsibility for forest law enforcement, effectiveness of measures and tools to prevent forest crimes, effectiveness of incentives for officers and agencies to enforce forest laws, including investigation and prosecution, capacity of law enforcement agencies to suppress, detect and prevent forest-related crimes and illegal activities, appropriateness and effectiveness of enforcement agencies' use of tools, instruments and information to enforce laws, capacity and willingness of the judiciary and law enforcement agencies to deal with cases of forest crime effectively, extent to which courts and arbitrators are accessible, fair, honest and independent, work in a timely manner that is affordable; and deliver enforceable outcomes.

### **3.5 Role of Government**

To ensure the necessary coordination and collaboration between institutions to promote a coordinated natural resources policy, conflict resolution, and spatial planning, ensure the protection of biodiversity habitats, sites of historical and cultural value, and scenery, ensure responsible attitude in forestry through its enactments and regulations, to adopt the anthropocentric approach through the provision of goods and services to the people (i.e. food security and general well-being of entire rural communities using forests to alleviate poverty).

### **4.0 CONCLUSION**

Forest administration is an invaluable asset for the effective sustainable management of forest resources for both present and future use. The government should strictly penalized offenders who are guilty of forest offense which would act as a deterrent to the populace.

### **5.0 SUMMARY**

In this unit, we have learnt about:

- the role of forest administration for the sustainable management of forest resources
- the challenges facing forest administration sector
- government participation in forest resource management

### **6.0 TUTOR-MARKED ASSIGNMENT**

1. Appraise the role of forest administration
2. Discuss in detail the role of the government in forest management

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## **UNIT 4 WILDLIFE ADMINISTRATION**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Duties of Wildlife administrators
  - 3.2 Wildlife protection services
  - 3.3 Enforcement of wildlife legislation
  - 3.4 Species-based international agreements
  - 3.5 Ensuring clarity in the institutional set-up
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Subordinating wildlife administrations to higher-ranking bodies in which timber or forest industry interests may easily prevail can foster great dependency. High-level decisions may well choose to ignore the technical arguments in favour of wildlife. In practice, the autonomy of wildlife policy-makers depends very much on the personal and political influence of the head of the wildlife service. Interviews and surveys do show, however, that many wildlife administrators see themselves as islands in a sea of public and official indifference, trammled by inappropriate policies and sterile bureaucracies. This subordination, combined with the fact that staff, funds and equipment for the wildlife services have low priority, seriously hinders development efforts. Wildlife management can be defined as the process of maintaining certain wildlife populations, including endangered species, at desirable levels on the basis of scientific, technical and traditional knowledge. Sustainable wildlife management adds to this definition the objective of balancing the economic, ecological and social values of wildlife, with a view to protecting the interests of present and future generations. Thus, this concept goes beyond the protection of interests related to hunting and protection for individual species and rather focuses on wildlife as a renewable natural resource in a holistic way.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain duties of forest administrators
- interrelate poor administration to wildlife management

### **3.0 MAIN CONTENT**

#### **3.1 Duties of Wildlife administrators**

The work of the wildlife administrations runs the gamut from planning action and strategy to such mundane duties as issuing licenses, keeping statistical records, processing infractions, managing protected areas, and so forth.

#### **3.2 Wildlife protection services**

Wildlife protection services are necessary to ensure effective compliance with the regulations governing wildlife utilization. This is vitally important in tropical countries where most hunters disregard or do not know the existing laws.

#### **3.3 Enforcement of wildlife legislation**

Application and enforcement of laws to all taxa are inconsistent. Although state authority over the allocation of the take of resident game species is well defined, country, local, or housing development ordinances may effectively supersede state authority. Decisions on land use, even on public lands, indirectly impact allocation of wildlife due to land use changes associated with land development.

#### **3.4 Species-based international agreements**

Endangered species legislation involves a specialized legal approach to wildlife management. It focuses exclusively on the identification and restoration of species that have reached critically low population levels, on the basis of defined criteria and procedures for listing these species and at least two general mechanisms designed to ensure recovery of individual species. Listing criteria and procedures are based on science-based definitions of “threatened” and/or “endangered,” both of which imply an assessment of the status of the species and the threats to their continued survival. The primary mechanism for recovery is the requirement that government agencies and private developers consider listed species in designing and constructing projects and include adequate protection measures to minimize or mitigate project impacts and ensure the species long-term survival or recovery. The second mechanism is the prohibition of direct and/or incidental “take” of the species in question. “Take” includes the killing of such species by whatever means (not just hunting), as well as any actions that remove a species from its habitat, destroy critical habitat or otherwise harm, harass, or injure the species.

### **3.5 Ensuring clarity in the institutional set-up**

Another general principle for good legal drafting, which is also applicable to wildlife management laws, is that the law should clarify the mandate and functions of all public authorities related to wildlife management. “Legal mandates” refer to legal provisions requiring or allowing government agencies or persons to engage in activities affecting the resource or its components. This is a deliberately broad concept that encompasses all possible actions, activities, permissions, or even prohibitions. Usually, legal mandates are framed in general terms, thus resulting of difficult practical application, with no guidance as to the exercise of powers, limits to discretion or procedures for decision-making. Possibly, the law should provide some guidance to the exercise of public discretion, in order to increase the legitimacy and accountability of public authorities. Furthermore, with a view to enhancing the accountability of wildlife authorities and avoiding conflict of interests, the law should avoid the possibility of mixing management/commercial activities and control functions in the same (public or private) body.

### **4.0 CONCLUSION**

The role of wildlife administrators in managing wild fauna has really strengthened the Nation’s wildlife reserve. However, there has been weak enforcement of wildlife legislations across the country and beyond.

### **5.0 SUMMARY**

In this unit, we have learnt about:

- the role of wildlife administration for the sustainable management of wildlife resources
- the weak and epileptic state of wildlife enforcement agency

### **6.0 TUTOR-MARKED ASSIGNMENT**

1. Discuss the benefit of efficient wildlife administration to wildlife management
2. Explain the role of enforcement of wildlife legislation.



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## **UNIT 5      IMPACT OF FOREST AND WILDLIFE POLICIES ON THE SOCIETY**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Forest Governance
  - 3.2 Tourism
  - 3.3 Employment
  - 3.4 Conservation of Nature's Heritage
  - 3.5 Encroachment
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

The national policy on conservation and sustainable use of biological diversity is an integral part of the national policy on environment. The national policy on environment which was reviewed in 2006/7 further strengthened the biodiversity conservation. Forest resources increasingly constitute a significant element in our national economy. Unlike in the past when forests were taken for granted because they were found almost everywhere, people are becoming increasingly aware of the direct and far-reaching influences of the forest as the available forests are continually diminishing while the demand for forest goods and services continues to rise. The administration of forest reserves in Nigeria leaves much to be desired especially when one considers governments' decisions and policies on utilization of forest resources in meeting the needs and aspirations of citizens. For the past forty years, the administration of forestry had been monopolized by the state government within the federal structure in Nigeria. The exclusion of the stakeholders such as (local community dwellers, hunters, farmers, timber contractors and other non-timber resources users) in the administration of forests directly or indirectly has led to poor forest governance and the consequent crises in forest reserves in Nigeria.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the positive impact of forest and wildlife policies on the economy

- discuss the negative impact of forest and wildlife policies on the economy

### **3.0 MAIN CONTENT**

#### **3.1 Forest Governance**

Forest governance can be defined as the management of forest resources within a particular institutional and technical environment bearing in mind the welfare of citizens whose livelihood hinge closely on forest resources and the need to maintain ecological balance. The technical environment provides the tools and knowledge, which define how a resource is used as a factor of production. The institutional environment defines who controls the resources and how the technique is applied. In another words, forest governance can be referred to as the process of planning, utilizing and managing forest resources through joint efforts of the governor(s) and the governed (the people). In such instance, forests are regarded as common property resources or common pool resources. Unfortunately, we do not yet have proper forest governance in Nigeria but purely forest administration devoid of people or users' considerations. Government's efforts of protecting forest are undermined by the fact that government has failed in its responsibility in other areas of life that are critical to the citizens. For instance, the absence of job opportunities for Nigerian citizens along-side forest protection program makes forest policy nonsensical and tangential when people who are ready to work at any rate (even by farming), for survival are jobless.

#### **3.2 Tourism**

Tourism which creates huge revenue for the developed countries due to proper, efficient and workable forest and wildlife policies is grossly lacking in many West African countries. Nigeria as country is gradually finding its feet in the area of tourism. Proper implementation of forest and wildlife policies will boost ecotourism, thereby boosting the GDP of the country.

#### **3.3 Employment**

When we consider the staffing conditions of the state's forestry services, we discover that most forestry services are underemployed or understaffed. Productivity is therefore generally low and the cost of administration is enormous. In certain states, the forestry services are charged with administering the forest policy and law. In addition, since forest administration is business oriented, its primary function are the conservation, management and sale of forest products. This affords a

unique position for forest service to demand good organization, structure and management, competence of the personnel based on the limited overall size of the forest estate and considered along a number of states. It will be obvious that present administration of forest policy is not economically satisfactory. A good, efficient and workable forest and wildlife policies will create room for more qualified staff to be employed thereby reducing the number of unemployed individual in the country.

### **3.4 Conservation of Nature's Heritage**

Nature's heritage will be preserved in perpetuity if forest and wildlife policies, laws and administration are further strengthened by the necessary authority.

### **3.5 Encroachment**

Weaknesses in the enforcement of forestry law could encourage open access to the forest resource. This could also result in encroachment of other competing land uses such as agriculture and urbanization, thus decimating the forestland area. Weaknesses in implementation of the management plan could result in under or over exploitation of the forest resource, thus leading to inefficiency. An estimated 45% (74,942 ha) of the forest reserve is devoid of forest trees. This could threaten economic stability and growth and food security. Weaknesses in enforcement of forestry law could provide indigenous communities opportunities to reap perceived benefits from the forests, which the government has denied them for the past years. Attempt has been made by the State government to incorporate the indigenous communities in the development of management plan and enforcement of forestry law.

## **4.0 CONCLUSION**

Forest and Wildlife policies, laws and administration impact on the society positively and negatively depending on how strong or weak these policies and laws are being implemented. Nigeria is still very slow in enforcing forest and wildlife policies and laws. Thus, there is an urgent need for proper implementation of forest policy as a strong safeguard for providing best option for halting forest decline as well making the required contribution to the well being of the society.

## 5.0 SUMMARY

In this unit, we have learnt about:

- the effect of forest and wildlife policies on society growth both positive and negative
- weak state of forest and wildlife policies in Nigeria

## 6.0 TUTOR-MARKED ASSIGNMENT

1. List and discuss the impact of forest and wildlife policies on the society

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### **MODULE 3 CHALLENGES TO THE IMPLEMENTATION OF FOREST AND WILDLIFE POLICY**

Unit 1	Forest Fires
Unit 2	Poaching
Unit 3	Illegal Grazing/ Logging
Unit 4	Buffer Zones
Unit 5	Conflicts

#### **UNIT 1 FOREST FIRES**

##### **CONTENTS**

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Sources and importance of wildfire
3.1.1	Uses of fire in Natural Resources
3.1.2	Improper Use of Fire
3.2	Periods of Wildfire
3.3	Economic Impacts of Wildfire
3.4	Ecological role of fire
3.4.1	Fire-sensitive ecosystems
3.4.2	Forest fires and climate change
3.5	Forest fires and climate change
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

#### **1.0 INTRODUCTION**

Landscape fires play an important role in many ecosystems across the globe, with (sub) tropical savannas of intermediate productivity being most frequently burned. Within those (sub) tropical ecosystems, humans are responsible for most of the ignitions and fires have been actively managed for thousands of years, partly aided by the vegetation traits of these regions which make them inherently. Most fires are anthropogenic in origin and are directly linked to livelihood activities. Some threats to forest protection identified are fires, poaching, trespass, illegal logging and uncontrolled grazing.

## **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the importance of wildfire
- discuss the economic impact of forest fire
- ecological role of wildfire

## **3.0 MAIN CONTENT**

### **3.1 Sources and importance of wildfire**

Wildfire has both natural and artificial origin. Wildfires occur in forest reserves and other bushes and plantation areas. The existence of favorable fire danger conditions like low humidity, high temperature, dry wind and sufficient dry matter together with human activities are found to be a major factor responsible for fire occurrence in Nigeria. Some of the causes of forest fire are: natural – lightening and friction due to objects robbing together and artificial – campfire, debris burning, lumbering, railroad, smokers and miscellaneous. It is therefore evidence that major causes of wildfire are of artificial sources resulting from human activities towards economic emancipation.

#### **3.1.1 Uses of fire in Natural Resources**

Humans have used fire as a vital tool for natural resource management for thousands of years. Traditionally, fire has been used as a management tool to control vegetation structure and composition, for hunting and to recycle nutrients locked in live and dead biomass. These uses have continued up to today particularly in savanna ecosystems of southern Africa and northern parts of Australia.

#### **3.1.2 Improper Use of Fire**

Improper use of fires often lead to veld fires, which are blazes that get out of control, destroying extensive tracts of forests and grasslands and may result in the loss of biodiversity and human life.

### **3.2 Periods of wildfire**

Wildfire occurs more frequently during the dry season between the months of December and March, when the air temperature is high and relative humidity and fuel loads moisture content are low. Vegetation is set ablaze annually between November and January (Early burning) or from February to the beginning of rains (late burning) .Early burning is done to provide early bush of palpable tender grass for livestock needing

in areas of wildlife conservation. Despite the value of early burning, such fires are uncontrolled and therefore penetrate ecosystems leading to loss of biodiversity. Late burning is done to hunt for game animals by hunters and farmers and are set indiscriminately, burning all fuels along its course and coming to rest after much destruction when there is no more fuel within an ecosystem.

### **3.3 Economic Impacts of Wildfire**

Wildfires can have both positive and negative effects on local economies. Positive effects come from economic activity generated in the community during fire suppression and post-fire rebuilding. These may include forestry support work, such as building fire lines and performing other defenses, or providing firefighting teams with food, ice, and amenities such as temporary shelters and washing machines.

### **3.4 Ecological role of fire**

Forest fires are a natural element of many, but not of all forest ecosystems. In cold or dry climates with limited decomposition of litter and accumulation of humus through soil microorganisms, forest fires ensure that future generations of trees are supplied with nutrients.

#### **3.4.1 Fire-sensitive ecosystems**

In fire-sensitive ecosystems, frequent, large and severe fires were rare until recently. Most plants and animals in these ecosystems lack the ability to benefit from the positive effects of a fire or to recover quickly after a burn. Thirty-six percent (36 %) of all ecosystems worldwide are classified as fire-sensitive. Their vegetation and structure usually prevent the outbreak and the spread of fires. In the long term, human-induced fires in a fire-sensitive ecosystem can affect its species composition or reduce its area.

#### **3.4.2 Forest fires and climate change**

By causing the release of greenhouse gases (GHG), forest fires contribute significantly to climate change. Warmer climate leads to forests becoming dryer and degraded, which increases their vulnerability to fire.

### **3.5 Wildfire suppression**

Appropriate fire -fighting measures depend on the type of fire. Creating firebreaks helps in the case of a ground fire. In this case several metre



wide strips are cleared of fuel by controlled burning so that the fire cannot spread.

#### **4.0 CONCLUSION**

Forest fire has both useful, beneficial purposes as well harmful detrimental effect on man, its environment, its natural resources as well as the economy. In the months after a fire, wildlife populations can suffer substantial losses due to habitat alteration and destruction. Since their habitat has been destroyed, wildlife becomes displaced and must spend more time searching for food, water and shelter. Displaced wildlife may travel to areas not affected by the fire, which puts stress on the displaced wildlife, as well as the wildlife that was already there, due to increased competition for available food, water and shelter.

#### **5.0 SUMMARY**

In this unit, we have learnt about:

- the sources, periods as well as the beneficial and harmful effect of forest fire on the environment
- the role of forest fire in climate change

#### **6.0 TUTOR-MARKED ASSIGNMENT**

1. List and discuss in detail the sources of forest fire
2. Discuss the socio-economic effect of forest fire
3. Explain the effect of forest fire on forest and wildlife conservation.

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## **UNIT 2      ILLEGAL HUNTING**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Local extinction due to hunting
    - 3.1.1 Subsistence hunting
    - 3.1.2 Commercial hunting
  - 3.2 Nutritional values
  - 3.3 Economic values
  - 3.4 Social and Cultural values
  - 3.5 Impacts on livelihoods
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Wildlife is facing serious global challenges, many flora and fauna species are continuously driven closer to extinction on daily basis. Less than 9% of the earth has been set aside as protected areas and there is constant pressure from increased human and cattle population, uncontrolled development of community on forest resources has ultimately caused fragmentation and degradation of wildlife habitats. Although bush meat trade is socio-economically important, researchers have condemned the unsustainable and illegal hunting and harvesting of wild animal meat for commercial purposes as a serious threat to the populations of these wild animals, including trade in them. Nigerian National parks are bedeviled with a myriad of problems prominent among them being poaching, logging, illegal grazing and bush burning. Illegal hunting of animals for trophy and meat is usually a major problem experienced in protected areas and is more or less universal in conservation areas of Africa. Wildlife is facing serious challenges all over the world, and many fauna and flora species are continuously driven closer to extinction on a daily basis. Poaching and illegal trade in wildlife has become an organized, lucrative and a capital intensive business, with trafficking routes extending from remote national parks and reserves, where animals are trapped and killed, to major urban centres where they are sold and consumed. Although wildlife laws exist as a global conservation tool for protection of species, most remain unenforced, due to limited human, financial and material resources required to monitor illegal activities and enforce existing laws. Rules and measures to enforce them are at the heart of conservation.

## **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain what poaching is about
- explain reasons for hunting in or around conservation areas
- the effect of illegal hunting on conservation laws and policies

## **3.0 MAIN CONTENT**

### **3.1 Local extinction due to hunting**

Large animals tend to be those that hunters favour most as killing one animal supplies a large amount of meat, and larger animals tend to be the ones that have the most valuable horns, antlers, tusks, furs, skins, feathers or other artifacts. Thus, the value returned per unit of time and cost expended by hunters is greatest for large animals. Large species are rare compared to smaller ones and reproduce slowly; thus, they are especially vulnerable to overhunting and have limited capacity to recover from population declines. Primates breed more slowly than their size alone would suggest, so they are vulnerable to hunting in ways which are more like those of much larger animals.

#### **3.1.1 Subsistence hunting**

This is the illegal killing of wildlife by locals inside the protected area to supplement scarce diet.

#### **3.1.2 Commercial hunting**

This is the illegal killing and or capture of wildlife by locals or outsiders inside the protected area for commercial purposes i.e. to sell the meat in large markets of villages or cities for consumption as delicacy or for pet trade.

### **3.2 Nutritional values**

Bush meat represents an important protein source in the tropics while gathered plant foods are important dietary supplements to the starchy staple diet. In at least 62 countries world-wide, wildlife and fish constitute a minimum of 20% of the animal protein in rural diets. Wildlife provides significant calories to rural communities, as well as essential protein and fats.

### **3.3 Economic values**

Rural people, moving from a subsistence lifestyle to a cash economy, have relatively few options for generating income. They can sell agricultural or pastoral produce, work for a cash wage in agriculture or industry, or sell retail goods in local or regional marketplaces. However for rural people, without access to capital, land or livestock, the harvest of wildlife resources may offer the best return for labour input.

### **3.4 Social and cultural values**

Wildlife and hunting are intimately linked to many cultures throughout the world's tropical forests even if in some cases the meat is only of minor nutritional importance. Important social and cultural values are linked to foods and medicines derived from wild resources. Therefore while hunting provides meat and income it also remains an important social and cultural tradition for many peoples both in developed and in developing countries. Acquisition of animal parts as cultural artifacts, for personal adornment or for hunting trophies is still a widespread practice throughout tropical forest regions and the rest of the world. In many cultures to be a hunter is essential in gaining respect, achieving manhood or winning a bride.

### **3.5 Impacts on livelihoods**

Conventional wisdom tells us that the people who, in theory, will suffer the most from declining wildlife resources due to poaching activities are the millions of people across Latin America, Africa and Asia living in and from the forests. These people (hunter-gatherers, cultivators, urban poor) are often the poorest and most marginalized people in their country. They typically lack the education and skills to easily find alternative employment. They lack capital or access to agricultural markets and cannot switch to alternative livelihoods or food sources.

## **4.0 CONCLUSION**

Poaching is a complex phenomenon and its motivation and impact on wildlife are diversified in different countries. The harvesting of wildlife, especially for food, is a complex problem, one in which biological issues and conservation concerns should play an important role alongside livelihood issues. Such a problem has no simple solution and actions will have to be taken at all levels from the international policy dialogue to the field-project level. If attention is focused solely on field-level initiatives, such as protected area management, then the underlying forces driving unsustainable and unregulated harvest will continue.

## 5.0 SUMMARY

In this unit, we have learnt about:

- illegal hunting and its adverse effect on conservation efforts
- the economic, nutritional and socio-cultural reasons for hunting
- the impact of poaching on the livelihood of dwellers in and around conservation areas

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the effect of illegal hunting on forest and wildlife policies in Nigeria
2. Outline and discuss the reasons for hunting in and around conservation areas

## 7.0 REFERENCES/FURTHER READING

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## **UNIT 3      ILLEGAL GRAZING/LOGGING**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Illegal grazing
  - 3.2 Illegal Logging
  - 3.3 Fuelwood consumption
  - 3.4 Effect of illegal grazing on wildlife
  - 3.5 Effect of illegal logging on wildlife
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0      INTRODUCTION**

The increase in depletion and extinction of the world's biodiversity has led to a greater interest from the global community to protect the environment and safeguard natural habitats and thousands of species. The establishment of protected areas is construed to be the most feasible strategy of maintaining biodiversity. Nigeria's biodiversity is one of the richest in Africa. The Federal Ministry of Environment Fourth National Biodiversity Report (2010) opined that Nigeria's geographic features endow her with one of the richest biodiversity in African continent. But despite this richness, conservation of Nigeria's biodiversity is currently at lowest ebb. Although, various policies and strategies aimed at sustaining biodiversity have been developed, particularly at national level, biodiversity decline continues unabated. Habitat loss, fragmentation, overexploitation of natural resources, pollution, and the spread of invasive alien species have long been recognized as the “Big Five” threats to global biodiversity. Illegal logging is one of the main contributors to deforestation and forest degradation. Illegal logging undermines forest ecology and the environmental services of forests, and has become the main barrier to sustainable forest management. Apart from its environmental effects, illegal logging also leads to various socioeconomic problems. Trade of illegally harvested timber disrupts the global market and often coexists with corruption, which results in reduced incentive to manage forests sustainably and efficiently.

## **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the effect of illegal grazing and logging activities in and around protected areas
- discuss the impact of illegal grazing and logging on wildlife

## **3.0 MAIN CONTENT**

### **3.1 Illegal grazing**

Livestock grazing is one factor driving large mammal population declines and threatening conservation efforts in African savannas (Ogotu, *et al.* 2016, Schieltz and Rubenstein 2016). Since some wild ungulate species are similar to livestock in terms of body mass and diet, the presence of livestock in ecosystems might impact negatively on the structure of native herbivore communities due to competitive exclusion.

### **3.2 Illegal Logging**

Illegal logging and the international trade in illegally logged timber is a major problem for many timber-producing countries in the developing world, particularly in West Africa. It causes environmental damage, costs governments billions of dollars in lost revenue, promotes corruption, and undermines the rule of law and good governance and in some instances, provides funding for specialized crimes such as terrorism. Illegal logging also retards sustainable development in some of the poorest countries of the world. Consumer countries contribute to these problems by importing timber and wood products without ensuring that they are legally sourced.

### **3.3 Fuelwood consumption**

About seventy percent (70%) of Nigerian households mainly in rural and semi-urban areas depend largely on fuel wood consumption for their domestic and to a large extent commercial energy needs. The demand for fuel-wood is higher in the less vegetated north and in urban cities where most poor who cannot afford other cost of other sources of energy supply use fuel wood for food production. Charcoal production is also in high demand from the highly populated cities and is the most critical cause of forest degradation in some parts of the country. With growing population, increasing poverty and relatively low industrialization rate, Nigeria should develop mechanism to expand the scope of energy requirements in rural and semi-urban areas as part of the strategies to save biodiversity and increase the size of the national vegetation cover.



### **3.4 Effect of illegal grazing on Wildlife**

Illegal grazing impacts negatively on wildlife. For example, foraging behavior, habitat and diet of wild ungulates changes in the presence of competing cattle. This occurs mostly during lean resource availability when grazing ranges are constricted to available water and when overall fodder quality is lower. Due to diet overlap, there is a reduction in plant biomass available for wild herbivores. Hence wild species will consume less suitable forage as they are outcompeted by livestock. Therefore, ecosystems with high levels of grazing host significantly fewer mammals than expected.

### **3.5 Effect of illegal logging on wildlife**

This leads to habitat destruction, displacement, long distance travel of the displaced wildlife which often impacts negatively on the health of the wild animal, high competition on vegetation in the new environment and it sometimes leads to death as the displaced wild animals becomes a ready meal for other predators.

## **4.0 CONCLUSION**

It is a fact that protected areas play an essential role in conservation of biodiversity in general for the survival of mankind. For effective long-term rangeland productivity and management of these protected areas, there is the urgent need to tackle the existing challenges to meet the current realities in the country. Illegal grazing and illegal logging is a serious threat to biodiversity conservation.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- illegal grazing and illegal logging as detrimental effect on conservation effort
- the negative impact of illegal grazing and illegal logging on wildlife resources

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. Explain clearly the effect of illegal grazing and logging on wildlife species in National protected areas
2. Discuss the Impacts of illegal logging and grazing on wildlife

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## **UNIT 4      BUFFER ZONES**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Management functions of buffer zones
  - 3.2 Activities allowed in Buffer Zones
  - 3.3 Activities not allowed in Buffer Zones
  - 3.4 Benefits of Buffer Zones
  - 3.5 Challenges of Buffer Zone Management
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0      INTRODUCTION**

The buffer zones are intended to serve direct ecological purposes such as the minimization of the effects of landscape fragmentation and core area diminishment and isolation. Buffer zones aim at controlling human activities within the lands adjacent to a core area by promoting sound management, thus decreasing the potential impacts and diminishing effects of small size. The presence of indigenous people is implicitly permitted within the buffer zones. This is to encourage minimal economic activities and sense of belonging; otherwise the buffer zones would be a totally protected area. A buffer zone is an area lying between two or more other protected land area and serving to reduce the possibility of damaging interactions between them. Buffer zones also promote the sustainable use of wild plant and animal species by local communities and provide mechanisms by which local people can genuinely benefit from the existence of a protected area. Nature conservationists distinguish two different ways of approaching the buffer zone issue. For the 'hard-core' conservationists, the buffer zone serves only to avoid negative human impact on the core area. The socio-conservationists see the buffer zone as part of the socio-economic development of the entire area comprising conservation and non-conservation sub-areas.

### **2.0      Objectives**

At the end of this unit, you should be able to:

- explain the management functions of Buffer Zones
- explain the benefits of Buffer Zones to rural dwellers

- the challenges of Buffer Zones to forest and wildlife policies

### **3.0 MAIN CONTENT**

#### **3.1 Management functions of buffer zones**

The following major management functions for buffer zones can be enumerated: accomplishment of area requirements, correcting the shape of the core area (in order to: minimize the exposed perimeter to outside effects and conserve internal resources more efficiently; facilitate interactions with adjacent ecosystems and with more distant portions of the landscape and correct the orientation of the long axis of the core relative to flows- such as wind, water, nutrient, and individuals in the landscape), support the direct site management, management of factors that directly affect the ecological conditions on the site, immediate protection purposes, protecting traditional land-use and deflecting threats, mitigation purposes and as an area set aside for manipulative research.

#### **3.2 Activities allowed in Buffer Zones**

Activities that are commonly allowed in buffer zones include; hunting or fishing using traditional methods, collection of fallen timber, harvesting of fruits, seasonal grazing of domestic stock, and harvesting of specified Non Timber Forest Products (NTFP) like rattan or grasses.

#### **3.3 Activities not allowed in Buffer Zones**

Activities that are excluded in buffer zones generally include burning of vegetation, cutting of live trees, construction of buildings and establishment of plantations.

#### **3.4 Benefits of Buffer Zones**

One of the benefits that local people derived from this type of land use is the provision of a measure of protection from wildlife degradation. Others are the establishment of physical barriers to human encroachment into the strictly protected core zones. Buffer zones also promote the sustainable use of wild plant and animal species by local communities and provide mechanisms by which local people can genuinely benefit from the existence of a protected area.

#### **3.5 Challenges of Buffer Zone Management**

One of the most serious problems in buffer zone management is the assumption that limited benefits that flow to local people can change

their behaviours, reduced pressure on the plants and animals by the protected areas and thereby enhance the conservation of biological diversity. However, only a few buffer zone management programmes have succeeded in establishing stable and compatible land use systems around protected areas in a way that local people are genuinely reconciled to the conservation function of the area.

#### 4.0 CONCLUSION

Buffer zones play significant beneficial roles in the lives of the rural people and it can be a menace to the protected area if forest and wildlife policies are not properly enforced and implemented.

#### 5.0 SUMMARY

In this unit, we have learnt about:

- the benefit of buffer zones to rural dwellers
- the challenges of buffer zones to conservation management

#### 6.0 TUTOR-MARKED ASSIGNMENT

1. Enumerate the benefits of Buffer zones
2. Explain the challenges of buffer zones to implementation to forest and wildlife policies

#### 7.0 REFERENCES/FURTHER READING

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## **UNIT 5      CONFLICTS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Land conflicts in protected areas
    - 3.1.1 Governance of land resources
  - 3.2 Poverty
  - 3.3 Climate changes
  - 3.4 Competition over scarce resources
  - 3.5 Human Wildlife Conflict
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0      INTRODUCTION**

Conflict is the situation where two or more parties perceive their interests as incompatible and express hostile attitudes or pursue their interest through actions that damage other parties. Conflicts can also be defined as a relationship involving two or more parties who have, or perceive to have, incompatible interests or goals. There has been tremendous stress on environmental resources as a result of technological advancement, human population growth, desire for higher standard of living and global interdependence. The stress is ever more apparent by the gradual loss of critical natural ecosystems worldwide which has been the major factor in the alarming rate of biodiversity loss.

### **2.0      OBJECTIVES**

At the end of this unit, you should be able to:

- explain the effect of poor government policies and laws as a fuel to conflict
- explain the causes of conflicts and its effect on protected areas

### **3.0      MAIN CONTENT**

#### **3.1      Land conflicts in protected areas**

Natural resource conflicts occur due to multiple and competing demands on resources. Land use conflicts can arise if user groups are excluded from participating in natural resource management, if there are

contradictions between local and introduced management systems, lack of information about policy and programme objectives, lack of clarity in laws and policies, inequity in resource distribution or poor policy and programme implementation.

### **3.1.1 Governance of land resources**

Governance of land resources refers to the institutions, policies and processes that are established to regulate their management, ownership, allocation, use and protection. Resource rights and related laws determine who can use what resources, for how long, and under what condition if there is poor governance then land use conflict occurs.

### **3.2 Poverty**

High levels of poverty and a lack of employment opportunities are the main causes of resource conflicts. People need incomes to support their basic needs turning them to protected areas resources like timber, minerals, bush meat and honey for supporting their life although the markets lucrative are not profitable but can bring some incomes into households. The need for food also drives populations into the PAs resources as they depend on them for food.

### **3.3 Climate changes**

Climate change affects rainfall and temperature causing food insecurity which forces people to depend on natural resources. These changes on environment cause people to migrate to areas which are not affected by climate change like in protected areas to search for pastures and agriculture area leading to conflict.

### **3.4 Competition over scarce resources**

The concept of resource scarcity is the situation where the supply of renewable resources such as forests, rangelands and croplands is not sufficient to meet the local demand. Increased scarcity of natural resources needed to sustain livelihoods can increase competition between user groups or between economic sectors. Social responses to rising competition can include migration, technological innovation, cooperation and violent conflict.

### **3.5 Human Wildlife Conflict**

Conflicts between wildlife and people, particularly those who share the immediate boundaries with protected areas, are common phenomenon

all over the world. Human Wildlife Conflict (HWC) usually occurs when wildlife requirements overlap with those of human populations, creating costs to residents and wild animals. Protected Areas are sometimes instrumental in fueling social conflicts between groups. Simply put, conservation of wildlife has been a source of conflict in many parts of the world.

#### **4.0 Conclusion**

A conflict is a major threat to lives among dwellers around protected areas and conservationist. Conflicts also exist between man and wildlife. Strict measures should be taken to resolve these conflicts.

#### **5.0 Summary**

In this unit, we have learnt about:

- the role of poor implementation of government policies as a catalyst to conflict
- the causes of conflict and its impact on the environment

#### **6.0 TUTOR-MARKED ASSIGNMENT**

1. What is land hunger?
2. Discuss extensively the causes of conflicts in protected areas

#### **7.0 REFERENCES/FURTHER READING**

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**MODULE 4 FORESTRY AND WILDLIFE OUTLOOK**

Unit 1	Forest Industries
Unit 2	Wildlife Prospect
Unit 3	Protected Areas and Uses
Unit 4	Global View of Forestry Sector
Unit 5	National Environmental Regulation

**UNIT 1 FOREST INDUSTRIES****CONTENTS**

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Wood Based Panels
3.2	Particle Board
3.3	Furniture industries
3.4	Industrial Round wood
3.5	Employment Opportunities
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

**1.0 INTRODUCTION**

Forests serve as an engine of growth that propels economic activities especially for a nation that is endowed with abundant forest resources. The forest products industry in Nigeria was one of the most developed within the Nigerian economy in the 1960's to the early 1970's. During this period, export of wood products and agricultural commodities provided more than 70% of the country's Gross Domestic Product (GDP). Forestry Outlook Study for Africa (FOSA) is an initiative led by FAO and carried out in partnership with all African nations, the African Development Bank, the European Commission, regional and sub-regional inter-governmental organizations, the World Bank and others. It is a process for analyzing the future potential of the forestry sector to contribute to the well-being of African citizens through its economic, social and environmental functions. FOSA will analyze the status, trends and driving forces shaping African Forestry, provide a region-wide vision of the sector to the year 2020 and identify policies, programmes and investment options that will help move the sector forward.

The Nigerian Forests supports a wide range of forest industries, which include both the formal and informal sub-sectors. A vast majority of the Nigerian populace depend on these industries thus placing a lot of pressure on the forest resources of the nation. The formal sector is essentially wood based and is fairly well developed and comprise mechanical wood industries, including sawmills, veneer and plywood manufactures, particle board, paper and paper board manufactures. Furniture manufacturing is also carried out at a secondary level.

## **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the industries in forest
- itemize some of the challenges facing the forest industries

## **3.0 MAIN CONTENT**

### **3.1 Wood Based Panels**

There are eight veneer and plywood plants in the country using approximately 170,000 m<sup>3</sup> of logs per annum. Veneer slicing operations are all integrated within plywood mills. Plywood requirements for the country were estimated at 179,000 m<sup>3</sup> in 1990 and this was expected to increase to 285,000 m<sup>3</sup> in 2000 and 450,000 m<sup>3</sup> in 2010. At the same time wood availability is expected to decrease from 170,000 m<sup>3</sup> in 1990 to an expected 119,000 m<sup>3</sup> in 2010. It is evident that demand for veneer logs outstrips supply. The total capacity of eight mills is 126,000 m<sup>3</sup>/year and capacity utilization by 1993 was 57.3%. Veneer mills are already experiencing difficulties in acquiring log supplies.

### **3.2 Particle Board**

Particle board requirements for the country are estimated at 108,000 m<sup>3</sup> in 1990, 199,000 m<sup>3</sup> in 2000. Current production is hampered by high cost of foreign exchange for new equipment, spare parts and glue acquisition. The particle board production lines in Nigeria are integrated with sawmills and plywood mills, the residues of which they recycle.

### **3.3 Furniture industries**

The furniture industry is strategic in the use of planks from the saw mills. It forms the major market for wood products in Nigeria and protects the continued existence of primary wood industries such as sawmills and ply mills.

More than 400 furniture companies of various sizes exist in the country. The shortfall in large furniture companies is made up by the numerous cottage and small scale furniture makers which numbers more than 10,000 outlets. This category of furniture makers usually operate in the informal sector and are found in the rural and urban areas where middle and low income earners reside. Wooden furniture parts and components are now being manufactured and exported by a few large companies in Nigeria. Wooden furniture represents the major market for wood products in Nigeria. Many of the industries suffer from high cost of production due to energy cost and lack of patronage.

### **3.4 Industrial Round wood**

Round wood production in Nigeria comes mostly from the natural high forest zone of the country, in particular from the Southern states of Cross River, Edo, Ogun, Ondo and Oyo states of Nigeria. Round wood is no longer exported from Nigeria since this has been placed on ban.

### **3.5 Employment Opportunities**

Forestry sector provides employment opportunities for thousands of Nigeria. These include management staff, the labour forces in all forest based industries. About 80% of the rural population of Nigeria is engaged in agro-forestry and other agro-allied activities.

## **4.0 CONCLUSION**

Forestry industries have unique and present rare opportunities for Nigeria and Nigerian populace if adequate attention is given to this sector.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- the various forestry industries and their relevance to National development
- the challenges of some of the forestry industries

## **6.0 TUTOR-MARKED ASSIGNMENT**

- 1 List and discuss seven forestry industries and the challenges militating against these industries
2. Explain the effect of weak forest policies on forestry industries in Nigeria

3. Write out the current status of the Forestry industries in Nigeria

#### 7.0 REFERENCES/FURTHER READING

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## UNIT 2 WILDLIFE PROSPECT

### CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Protecting wildlife from harmful processes
  - 3.2 Regulating different types of wildlife use and of hunting
  - 3.3 Accurately identifying game and non- game species
  - 3.4 Endangered animals
  - 3.5 Sustainable Use
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### 1.0 INTRODUCTION

The wildlife of Nigeria is particularly varied because of the country's location, size and the ecological zones. The lowland Rain Forest Ecological Zone is the richest zone in Nigeria in terms of biodiversity and the most valuable forest resources (FDF, 1998). There are about 129 large mammal species in the rainforest and include African Elephants (*Loxodonta africana*), African buffalo (*Syncerus caffer*) and hippopotamus (*Hippopotamus amphibius*). Other large species include the large duikers (for example, *Cephalophus niger*) the Chimpanzee (*Pan troglodytes*), and the red river-hog (*Potamochoerus porcus*). In the savannas, they include the hartebeest (*Alcephalus buselaphus*) and warthog (*Phacochoerus aethiopicus*). In areas of derived savannah, forest species such as elephants and chimpanzees may be observed foraging on food crops adjacent to the forest. There are also a wide variety of small mammals including the grass cutter (*Thryonomys swinderianus*), giant rats (*Cricetomys spp.*), tree squirrels (*Funisciurus spp.*) and a range of primates. Indeed there are 123 species in the Guinea savannas while 35 species of bats, 23 species of rodents and 20 species of carnivores among others are represented in the country. The lowland rain forest zone also provides habitat for about 200 species of birds. The effect of population pressures on this wildlife is very profound as they are indiscriminately hunted for food and trophy.

## **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explicate on the role of wildlife policies on the relative abundance
- explain what threatened, endangered and wildlife extinction is about

## **3.0 MAIN CONTENT**

### **3.1 Protecting wildlife from harmful processes**

Wildlife conservation does not only entail the protection of species or of their habitats from activities directly affecting them (such as off-take and trade), but also protecting them from activities that may indirectly impact on them in a negative way. This is the case of industrial developments, construction, tourism and mining operations that may result in a serious disturbance to wildlife species or in the destruction of their habitat. In addition, competing land uses (forestry or agriculture) may also affect wildlife, and usually different pieces of legislation may regulate in different (and sometimes conflicting) ways their impacts on wildlife. This is in recognition of the fact that actual or potential effects of human activities may concern adjacent or other ecosystems. Indeed, in accordance with the Convention on Biological Diversity, countries are required to identify and control all potential sources of adverse impacts on biodiversity, and to carry out environmental impact assessments of projects likely to have "significant adverse effects" on biodiversity.

### **3.2 Regulating different types of wildlife use and of hunting**

According to the ecosystem approach, the objectives of sustainable use should be determined in order to provide policy guidance, and inform management and planning. Defining and regulating different types of wildlife use including hunting (i.e., subsistence/cultural, recreational, and scientific) and non-hunting uses (such as eco-tourism, game ranching and breeding) is common in regulatory schemes, but regrettably rarely useful. The most frequent problem is the failure to make a connection between the defined types of use, the procedural mechanisms that implement them, and the associated values, quotas, and areas where they may take place.

### 3.3 Accurately identifying game and non-game species

To avoid confusion, international best practice dictates that hunting legislation should specifically identify (using common names and scientific names) not only what can be hunted, but also what cannot. Many hunting regulations use only common names and catch-all categories that can result in confusion and possible management gaps. This is especially true for birds where catch-all categories such as “waterfowl” or “ducks and geese” are used to regulate hunting of all birds that fall within that category. In either of these examples, the category includes several species some of which may be globally threatened and/or listed in a particular country as endangered. A failure to make the necessary distinctions may inadvertently result in legally authorizing the take of species not intended by the drafters.

### 3.4 Endangered animals

Endangered animals are species that are seriously at risk of extinction. They are categorized as likely to become extinct. Endangered (EN), as categorized by the International Union for Conservation of Nature. Nigeria contains portions of the Savannas, Gulf of Guinea Rivers, Coastal Forests, Coast Mangroves and others that house a lot of animals. The following are some animals in that are rated as Endangered (EN) or Vulnerable (VU) as contains in the 2004 IUCN Red List of Threatened Animals. They are: Chimpanzee, Crested Genet, **Dama Gazelle**, Giant African Water Shrew, **Cross River Gorilla and the Hartwig's Soft-furred Mouse**.

### 3.5 Sustainable Use

The law plays a fundamental role in regulating different uses of wildlife and ensuring that these are sustainable. Besides the need for accordance with management planning, there are several specific legal tools that can be used to ensure sustainable use by regulating hunting, recreational, traditional/subsistence and scientific use of wildlife, as well as trade. These tools include the use of administrative instruments (quotas, licenses/permits and concessions) or contractual arrangements (agreements) to be adapted on a case-by-case basis, as well as general provisions on the regulation of the quantity, time and methods for specific uses.

## 4.0 CONCLUSION

Due to the anthropogenic activities of man and a very weak non-enforceable forest and wildlife policies and laws, the fate of wildlife

species is bleak as can be seen of some of the wild animals, being either threatened, endangered or going into extinction.

## 5.0 SUMMARY

In this unit, we have learnt about:

- some regulations that will lead to the successful conservation of wildlife
- the reasons why some wildlife species are endangered and the wise use of wildlife resources

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the prospect of wildlife species to the development of the Nigerian economy.
2. List some threatened wildlife in Nigeria and the effect of wildlife laws and policies

## 7.0 REFERENCES/FURTHER READING

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## **UNIT 3      PROTECTED AREAS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Strict Nature Reserve
  - 3.2 Wilderness Area
  - 3.3 Protected Landscape / Seascape
  - 3.4 National Park
  - 3.5 Forest Management
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0      INTRODUCTION**

The International Union for the Conservation of Nature (IUCN) defines a protected area as “An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources and managed through legal or other effective means”. Protected areas are special places which are established and designated for the protection of important cultural or natural values. They have always been part of human culture and from the beginning of time people have associated certain places with special values and protected them from disturbance or exploitation. These include religious, spiritual and cultural places; in recent years, parks and natural areas have been added.

### **2.0      OBJECTIVES**

At the end of this unit, you should be able to:

- explain clearly protected areas in Nigeria
- explain the roles of protected areas in Nigeria

### **3.0      MAIN CONTENT**

#### **3.1      Strict Nature Reserve**

This is an area managed mainly for scientific purposes. Researches are carried out in this environment.

### **3.2 Wilderness Area**

Wilderness areas are managed mainly for wilderness protection.

### **3.3 Protected Landscape / Seascape**

This area is managed mainly for landscape/seascape conservation and recreation

### **3.4 National Park**

This is a large area of land managed mainly for ecosystem protection and recreation.

### **3.5 Forest Management**

While the forests have many important uses only proper management will ensure the continuous supply of forest products and environmental sustainability. The important management techniques used for forest management includes: forest regulation, selective exploration, deforestation, regeneration, afforestation and taungya system.

## **4.0 CONCLUSION**

Protected areas are a large tract of land depending on the purpose for its setup, for the conservation of wild flora and fauna species for man's benefit.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- some protected areas
- the uses or reasons for setting up protected areas

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. List all the protected areas in Nigeria
2. Discuss in detail the uses of all the listed protected areas in Nigeria

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## **UNIT 4      GLOBAL VIEW OF FORESTRY SECTOR**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Economic Development
  - 3.2 Global Wood Products Industry to 2030
  - 3.3 Wood Products
  - 3.4 Globalization
  - 3.5 Policies, Regulations and Customer Preferences  
Linked to Climate Change
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Although separated by great, but diminishing, geographical and cultural distances, the forest sectors of different countries are linked through international trade and global environmental policies. To a large extent the future of any country, even a large country such as the United States, depends on world markets. It is therefore critical to understand how these markets work, and how they are affected by economic, demographic and biological change, and by deliberate policy. Forestry and forests are changing under several drivers such as globalization, climate change, political instability, aging society, new technologies, and bio economy/green economy. Holistic and integrative approaches are needed, such as ecosystem services and corporate social response.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the global outlook of some forest industries
- discuss the effect of climate change on forest policies and regulation

### **3.0 MAIN CONTENT**

#### **3.1 Economic Development**

Economic growth, measured by the rate of change in gross domestic product (GDP), is generally associated with growing demand for products and services, including wood products. According to neo-classical growth theory, economic growth is driven by growth in population (*i.e.*, labor supply), capital and technological change. Due to diminishing returns to capital, and labor increases, economies will eventually reach a point (steady state) at which no new increase in production factors will create economic growth.

### **3.2 Global Wood Products Industry to 2030**

Global forest area is predicted to reverse its historical decline increasing from 4.0 billion ha in 2000 to 4.1 billion ha in 2030. This trend, however, hides continuing tropical forest loss, with 243 million ha predicted to be lost between 2000 and 2030. The largest predicted losses of forest area are in Africa and South America, due to slower growth in income per capita in these regions. Global forest stock is predicted to increase from 452 billion m<sup>3</sup> in 2000 to 535 billion m<sup>3</sup> in 2030, with most of this increase occurring in the non-tropical countries.

### **3.3 Wood Products**

The Global Forest Products Model projections suggest that the value of global consumption of wood products will increase in real terms at 1.9% per annum from US \$597 billion in 2002 to US \$1,023 billion in 2030. This reverses the decline in the value of consumption between 1992 and 2002, which occurred due to falling wood product prices and the decline in Russian production. The historical trend of processed products increasing their share of global wood product production and consumption is predicted to continue. This is due to countries demanding more processed wood products particle board, fibre board, printing and writing paper, and other paper and paperboard as they become wealthier.

### **3.4 Globalization**

For the forest sector, the principal effect of globalization has been reduced transport costs, which have led to increased forest-product trade and the creation of a truly global market for forest products. Globalization has reduced the importance of forest resources for the forest industry, and development has been driven predominantly by labor costs, levels of research and technology, and access to capital. Intensively managed forest plantations are increasingly replacing natural forests as the raw material resource. These changes eliminate the traditional ties between forest processing and locations with abundant

natural forests. Hence, forest industry functions have become spatially separated, *i.e.*, companies now utilize materials from various sources, and consequently can site manufacturing plants at different locations along the value chain, from the forest to the consumer.

### **3.5 Policies, Regulations and Customer Preferences Linked to Climate Change**

Policies aimed at mitigating climate-change can affect forest-product markets in various ways. One is by encouraging use of wood products instead of other materials that yield more Green House G emissions during the course of their production, subsequent use and disposal. As an example, public policies promoting the use of energy-efficient, renewable construction materials (e.g., the Code for Sustainable Homes in the UK) could boost global demand for construction timber. However, the way in which green building standards are formulated will greatly influence the strength of preferences for sustainable wood products over competing materials, based on lifecycle carbon emissions.

## **4.0 CONCLUSION**

Forestry and forests are changing under several drivers such as globalization, climate change, political instability, aging society, new technologies, and bio economy/green economy. Holistic and integrative approaches are needed, such as ecosystem services and corporate social response.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- forestry outlook of forestry globally
- the outlook of forestry sector up to 2030

## **6.0 TUTOR-MARKED ASSIGNMENT**

- 1 Discuss the global view of the forestry sector

## **7.0 REFERENCES/FURTHER READING**

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## UNIT 5      GLOBAL OUTLOOK OF WILDLIFE SECTOR

### CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 International wildlife tourism
  - 3.2 Governing Global Wildlife Trade
  - 3.3 Changes in the geographical range of Fauna
  - 3.4 World marine capture production
  - 3.5 Wetlands in international agreements
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### 1.0      INTRODUCTION

- 2.0 Environmentally unsustainable anthropogenic
- 3.0 activities have resulted in a significant increase in
- 4.0 the atmospheric concentrations of greenhouse gases
- 5.0 has substantially increased the global average
- 6.0 ambient and sea surface temperature. This situation
- 7.0 has convoked changes in the natural climatic
- 8.0 regimes in the global scale.
- 9.0 Environmentally unsustainable anthropogenic
- 10.0 activities have resulted in a significant increase in
- 11.0 the atmospheric concentrations of greenhouse gases
- 12.0 has substantially increased the global average
- 13.0 ambient and sea surface temperature. This situation
- 14.0 has convoked changes in the natural climatic
- 15.0 regimes in the global scale.
- 16.0 Environmentally unsustainable anthropogenic
- 17.0 activities have resulted in a significant increase in
- 18.0 the atmospheric concentrations of greenhouse gases
- 19.0 has substantially increased the global average
- 20.0 ambient and sea surface temperature. This situation
- 21.0 has convoked changes in the natural climatic
- 22.0 regimes in the global scale.
- 23.0 Environmentally unsustainable anthropogenic
- 24.0 activities have resulted in a significant increase in
- 25.0 the atmospheric concentrations of greenhouse gases
- 26.0 has substantially increased the global average
- 27.0 ambient and sea surface temperature. This situation



- 28.0 has convoked changes in the natural climatic  
29.0 regimes in the global scale.

Environmentally unsustainable anthropogenic activities have resulted in a significant increase in the atmospheric concentrations of greenhouse gases has substantially increased the global average ambient and sea surface temperature. This situation has convoked changes in the natural climatic regimes in the global scale. Climate change has impacted natural terrestrial ecosystems and wildlife in multiple ways. The trade in wildlife products, whether legal or illegal, is one of the most valuable businesses in the world. Tourism is classically regarded as traveling for recreation although this definition has been expanded in recent years to include any travel outside of one's normal working or living area. The global water cycle underpins primary production and nutrient recycling and provides fresh water and food for people. Wetlands are used for transport and hydropower. They provide raw materials and genetic resources, including medicines. They also help to mitigate floods, protect coastlines and store and sequester carbon.

## **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- discuss the present trends in the wildlife sector
- explain the future global fate of the wildlife sector

## **3.0 MAIN CONTENT**

### **3.1 International wildlife tourism**

Wildlife viewing has been identified as the activity forecast to have strong potential within the adventure travel sector in the world. Wildlife tourism globally attracts very large numbers of tourists, though there are no reliable global estimates for this sector as a whole. Judging by statistics available for North America, many millions more participate in other forms of viewing of free-ranging animals. Probably even greater numbers of people participate in viewing animals in zoos, with an estimated 600 million visitors annually. Consequently, wildlife tourism generates very large financial revenues on a global scale.

### **3.2 Governing Global Wildlife Trade**

The legal and illegal trades in wildlife are highly transnational – global trading routes link source countries with end- user markets via a series of complex networks, intermediaries and entrepôts. As a result,

governing the wildlife trade is a complex challenge, made even more difficult when that trade is illegal. The transnational nature of the legal and illegal trades' means that inter- state and multi- agency cooperation are required to ensure that the trade does not over- exploit particular species and risk driving them to extinction. The core aim of CITES is to monitor and regulate trade in wildlife and plants to ensure that they are not negatively affected by that trade. It operates via biennial Conference of the Parties (CoP), a system of appendices and national scientific and management authorities. CITES policy is based on the 'precautionary principle': policymakers must err on the side of caution if scientific experts cannot prove whether trade is damaging wildlife populations.

### **3.3 Changes in the geographical range of Fauna**

The geographical distribution of wildlife is highly influenced by climatic regimes, often by the means of species-specific physiological thresholds of temperature, precipitation, ambient humidity, and moisture regimes (Hoffman & Parsons, 1997). With on-going warming trends, these 'bioclimate envelopes' move towards poles or higher altitudes. Moreover, Habitat occupancy of fauna can be highly influenced by presence of their preferred vegetation community, which could shift in response to climate change. Therefore, within the limits of their dispersal capacity and resource wild fauna will track shifting climatic envelopes as well as their preferred vegetation community and shift their range poleward in latitude and upward in altitude

The geographical distribution of wildlife is highly influenced by climatic regimes, often by the means of species-specific physiological thresholds of temperature, precipitation, ambient humidity, and moisture regimes. With on-going warming trends, these 'bio-climate envelopes' move towards poles or higher altitudes. Moreover, Habitat occupancy of fauna can be highly influenced by presence of their preferred vegetation community, which could shift in response to climate change. Therefore, within the limits of their dispersal capacity and resource wild fauna will track shifting climatic envelopes as well as their preferred vegetation community and shift their range pole ward in latitude and upward in altitude.

### **3.4 World marine capture production**

Total capture production in marine waters was 81.5 million tonnes in 2014. There are still several countries that do not regularly report their annual catch statistics to FAO or for which data are not entirely reliable.

### **3.5 Wetlands in international agreements**

In December 2015, 196 governments agreed to an ambitious programme of climate change mitigation and adaptation under the UN Framework Convention on Climate Change. This calls on States to develop Nationally Determined Contributions (NDCs) to address climate change, with nature-based solutions as a key component, including from wetlands. These have a critical role in both adaptation and mitigation; in the latter through carbon storage and sequestration, particularly in peat soils and blue carbon in coastal waters.

## **4.0 CONCLUSION**

Conservation and wise use of wetlands are vital for human livelihoods. The wide range of ecosystem services wetlands provide means that they lie at the heart of sustainable development. Yet policy and decision-makers often underestimate the value of their benefits to nature and humankind. Today's holistic approach to sustainable management and development of fisheries and aquaculture, as promoted by FAO's Blue Growth Initiative aims at reconciling economic growth with improved livelihoods and social equity. It balances the sustainable and socioeconomic management of natural aquatic resources with an emphasis on efficient resource use in capture fisheries and aquaculture, ecosystem services, trade, livelihoods and food systems.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- international organisation that is governing the forestry outlook of forestry globally
- the future outlook of wildlife

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. List and discuss international agencies in wildlife sector globally
2. Wildlife tourism the global prospect

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## **MODULE 5            INSTITUTIONS AND THEIR RESPONSIBILITIES**

Unit 1	Federal Ministry of Environment
Unit 2	Forestry Department
Unit 3	Wildlife Department
Unit 4	Ministry of Agriculture
Unit 5	Universities/ Colleges and Technical Schools

### **UNIT 1            FEDERAL MINISTRY OF ENVIRONMENT**

#### **CONTENTS**

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Environmental Impact Assessment
3.2	National Park Services
3.3	Land Degradation
3.4	Forestry Research Institute of Nigeria
3.5	Reforestation and Conservation
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

#### **1.0            INTRODUCTION**

A number of institutions and organizations have been designated to carry out activities that could facilitate the implementation of the Conservation of Biological Diversity in Nigeria. The Federal Ministry of Environment coordinates the activities of these institutions. The creation of the Ministry is a deliberate design by the Federal Government to achieve a well-articulated, effective and efficient and efficient outfit that will adequately address and manage environmental issues in Nigeria in a holistic manner, devoid of duplication of efforts and competition among various government agencies.

#### **2.0            OBJECTIVES**

At the end of this unit, you should be able to:

- explain the duties and responsibilities of the Federal Ministry of Environment

- list some of the Departments that works under the Federal Ministry of Environment

### **3.0 MAIN CONTENT**

#### **3.1 Environmental Impact Assessment**

The Federal Ministry of Environment has the responsibility to ensure that all developmental projects are subjected to Environmental Impact Assessment before they are embarked upon.

#### **3.2 National Park Services**

The National Parks Service a parastatal of the Federal Ministry of Environment has the overall responsibility for the protection and conservation of biodiversity in the National parks.

#### **3.3 Land Degradation**

The Federal Ministry of Environment has the responsibility to ensure the control land degradation including soil erosion, combat desertification, abate pollution.

#### **3.4 Trained Personnel**

It also assists in the development of trained manpower to meet the demands of environmental management.

#### **3.5 Reforestation and Conservation**

The Federal Ministry of Environment has the responsibility to embark on reforestation and conservation of biological diversity.

### **4.0 CONCLUSION**

Federal Ministry of Environment plays significant role in the protection and conservation of Earth's natural resources.

### **5.0 SUMMARY**

In this unit, we have learnt about:

- the important roles of Federal Ministry of Environment
- some of the agencies that work under the Federal Ministry Environment

## 6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss the respective roles of the Federal Ministry of Environment to conservation of Flora and Fauna species in Nigeria

## 7.0 REFERENCES/FURTHER READING

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## **UNIT 2 FORESTRY RESEARCH INSTITUTE OF NIGERIA**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Genetic Regeneration
  - 3.2 Ecology
  - 3.3 Pest Control
  - 3.4 Cultivation
  - 3.5 Protection
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Forestry Research Institute of Nigeria was established as Federal Department of Forestry Research in 1954. The Institute's Decree 35 of 1973 and order establishing Research Institute of 1977 changed the status of the Department to an institute being supervised by the Federal Ministry of Environment, but the only Research Institute of the Ministry. For the purpose of developing the nation's education, Forestry Research Institute of Nigeria have a subsidiary college name Federal College of Forestry located in Ibadan charged with training and developing forestry and agricultural practice. The Federal College of Forestry, Ibadan (FEDCOFOR) has six specialized research departments (each having various specialized sections), three support departments. The following Departments of Forestry Research Institute of Nigeria includes; Sustainable Forest Management Department, Forest Product Development & Utilization Department, Forest Conservation & Protection Department, Forest Economics & Extension Department, Environmental Modelling & Management Department, Information and Documentation Department and Administration and Personnel Department.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- explain the function of Forestry Research Institute of Nigeria



- identify the various Departments within Forestry Research Institute of Nigeria and their respective research objectives

### **3.0 MAIN CONTENT**

#### **3.1 Genetic Regeneration**

Forestry Research Institute of Nigeria has the responsibility of improving genetic value of species of economic potentials.

#### **3.2 Ecology**

The research institute is saddled with the responsibility of improving the knowledge of the ecology of plants and animals.

#### **3.3 Pest Control**

It is to also improve knowledge of the methods of pest control and management of biodiversity in natural forest.

#### **3.4 Cultivation**

It is to integrate the cultivation of wild plants and wild animals of economic importance into the farming systems in different ecological zones to yield positive socio-economic benefits to the rural populace.

#### **3.5 Protection**

The Institute also performs the function of protecting the flora and fauna heritage while providing information through research.

### **4.0 CONCLUSION**

The value of Nature's biodiversity is rich source of heritage from the creator which needs constant care and attention for man's benefit. Forest Research Institute of Nigeria has proved to be an invaluable asset in conserving nature's unique heritage.

### **5.0 SUMMARY**

In this unit, we have learnt about:

- the various Department of Forestry Research Institute of Nigeria
- function of the Institute

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. List and discuss the functions of the Department of Forestry Research Institute of Nigeria

## **7.0 REFERENCES/FURTHER READING**

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Fourth National Biodiversity Report Abuja 2010.

## **UNIT 3 WILDLIFE DEPARTMENT**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Wild Training and Research Institutions
  - 3.2 International agreements on the Protection of the Environment
  - 3.3 Environmental impact assessment
  - 3.4 International NGO's
  - 3.5 Influence of Donors and International Institutions
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0 INTRODUCTION**

Wildlife management structures depend on the organisation in each country. These structures correspond to the constraints and advantages of national policies, and affect the establishment of wildlife management. Legal tools may ensure that local or indigenous communities will be able to benefit from wildlife management in a way that promotes biodiversity conservation, supports livelihoods and reduces poverty. Restrictive or flexible approaches to wildlife conservation, institutional arrangements for wildlife management, and related rules on tenure, management planning and requirements to ensure sustainable wildlife use form the basis of legal arrangements that establish how wildlife will be managed in a particular country and whether benefits from such management will reach local communities. Institutional arrangements for wildlife management vary from one country to another. Key legal issues concern the clear allocation of institutional mandates, the need to create mechanisms for inter-institutional coordination when more than one administrative entity is in charge of wildlife management or closely related issues and the need to ensure public participation in decision-making.

### **2.0 OBJECTIVES**

At the end of this unit, you should be able to:

- understand the important role of wildlife department
- explain the various branches of wildlife department

### **3.0 MAIN CONTENT**

#### **3.1 Wildlife Training and Research Institutions**

In Nigeria, there is the (Federal College of Wildlife) training, New Bussa. The training programs of this college have been targeted to wildlife management techniques, and other related ecology and biology sciences. Local people were supposed ignorant and their possible indigenous knowledge on wildlife was fully neglected. The only social science courses taught were focused on extension issues such as how wildlife managers should address their technocratic willingness to local people.

#### **3.2 International agreements on the protection of the Environment**

It is clear that West African Countries are parties to the main conventions related to Wildlife conservation: Biodiversity, Climate Change, Desertification, Endangered species (CITES), the law of the Sea, and the Organization of African Union convention. That indicates their willingness to cooperate on regional and world-wide options for nature protection. However, there is a lack of national resources engaged in wildlife conservation projects.

#### **3.3 Environmental impact assessment**

Efficient management of wildlife also entails protection from indirect threats, such as land uses other than hunting and other harmful processes. Usually legislation makes use of environmental impact assessments (EIA) to this end, but not necessarily specific wildlife concerns are taken into account. In addition, the extent of public participation in the EIA processes varies from one country to another, thus influencing the possibility of interested or potentially affected stakeholders to contribute information, share traditional knowledge and generally have their views heard.

#### **3.4 International NGO's**

There is a feeling that the region has been neglected for decades by number of international NGOs dealing with Wildlife conservation issues, perhaps as a result of poor publicity from the region itself. Most of nature conservation NGOs has also restricted their operations to tree planting, combating Desertification, and reforestation. Among the

reasons of that, the obstacles of wildlife legislations containing a lot of risks, and no incentive for investors.

### **3.5 Influence of Donors and International Institutions**

These partners in the processes of Development in Africa can play very positive or very negative role in Wildlife Conservation issues. For instance, by funding only reforestation projects in the Sahel for a long period, Environment authorities have withdrawn the human resources of Wildlife conservation for afforestation activities and commitments.

## **4.0 CONCLUSION**

The need for sustainable wildlife conservation is becoming more and more glaring as anthropogenic activities increases on a daily basis; hence wildlife department is one of the very important institutions to meet this challenge.

## **5.0 SUMMARY**

In this unit, we have learnt about:

- the role of wildlife department to conserving wild animals sustainably
- international support to wildlife conservation

## **6.0 TUTOR-MARKED ASSIGNMENT**

1. List and explain wildlife agencies to the conservation of wildlife resources

## **7.0 REFERENCES/FURTHER READING**

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## **UNIT 4      MINISTRY OF AGRICULTURE**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Roles of the Agricultural Sector
  - 3.2 Planned Agricultural Programmes
  - 3.3 Era of Agriculture Promotion Policy
  - 3.4 Agricultural Productivity in Nigeria
  - 3.5 Challenges and prospects of achieving the Agriculture Promotion Policy
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0      INTRODUCTION**

The agricultural sector has witnessed remarkable policy changes since the Nigerian Vision 20: 2020 (NV20: 2020) was launched in 2009. The first implementation plan (2010-2013) was ongoing when the agricultural transformation agenda (ATA) came on stream in 2011 and lasted till 2015. In August 2016, the agriculture promotion policy (otherwise known as the Green Alternative) was launched and it is now reshaping the direction of agricultural development in the country. As the nation experienced these different phases of strategic plans there has been no systematic framework of reviewing the performance of the sector in a holistic fashion to provide evidence to guide policy decisions and development strategies.

### **2.0      OBJECTIVES**

At the end of this unit, you should be able to:

- explain in detail the roles of agricultural sector as a major economic developer
- enumerate some of the planned agricultural programmes
- explain some of the challenges facing the agricultural sector

### **3.0 MAIN CONTENT**

#### **3.1 Roles of the Agricultural Sector**

Agriculture has traditionally been characterized as the “mainstay” of the Nigerian economy with many assigned roles to perform in the course of the country’s economic development. Among the roles conventionally ascribed to the agricultural sector in a growing economy are those of providing adequate food for an increasing population, supplying adequate raw materials to a growing industrial sector, constituting the major source of employment constituting a major source of foreign exchange earnings and providing a market for the products of the industrial sector. Supports biodiversity conservation in grazing reserves through control of hunting and harvesting of plants, encourage and promote the consolidation of scattered and fragmented farm holdings, encourages production of agricultural crops and commodities to ensure food and nutrition security in the country and for export.

#### **3.2 Planned Agricultural Programmes**

Under the vision 2020, the following are the planned agricultural programmes; Intensification of applied research; the strengthening of the Agricultural Research Council of Nigeria (ARC/N), Establishment and equipment of additional Research Institutes including the unbundling of the National Animal Production Research Institute (NAPRI) into a Beef and Dairy Cattle Research Institute to be located at Shika – Zaria with outstations in Sokoto, Jalingo, Umuahia, Maiduguri, Ilorin and Ebonyi (for Muturu sp.), a National Swine Research Institute, Makurdi, Benue State with outstations in Asaba, Ogbomosho and Awka; a National Poultry Research Institute, Enugu with outstations in Lokoja, Ado Ekiti and Minna; National Pasture/ Forage Research Institute, Yola, Adamawa State with outstations in Birnin-Kebbi, Shika, Abakaliki. Establishment of specialized centres and laboratories for crops, livestock and fisheries agricultural biotechnology research for the focused and intensified production of high yielding, consistently conformational and disease-resistant species of crops, livestock and fishery, with due consideration given to all ethical concerns.

#### **3.3 Era of Agriculture Promotion Policy**

In June 2016, the Agriculture Promotion Policy was launched and has since continued to guide the development initiatives in the sector. It strives to consolidate the successes of the Agricultural Transformation Agenda (ATA), close the policy gaps and reposition the sector for greater investment and increased diversification in order to accelerate

economic recovery, reduce poverty and enhance food security. There is a clear policy thrust which centres on food security, import substitution, job creation and economic diversification. This is to be achieved through a three-pronged approach of productivity enhancement (with emphasis on access to land, soil fertility improvement, access to information and knowledge, production management, storage, processing, marketing and trade, private investment expansion with emphasis on access to finance and agribusiness investment development and institutional realignment for improved service delivery and development outcomes with emphasis on greater inclusiveness, participation of youth and women, infrastructure, research and innovation, climate change as well as food and nutrition security.

### **3.4 Agricultural Productivity in Nigeria**

It is generally known that low productivity especially in terms of yield is a major characteristic of the agricultural systems - crop, livestock and fishery - in Nigeria. Crop yields in the country are lower than those of most other countries, both in food and cash crop and animal husbandry; and for virtually all the crops, there is an inverse relationship between growth in land area under cultivation and yields. As shown in Figure 3, the yields of grains such as rice, maize, beans and millet remain very low during the period under review. Under the vision 2020, a 3 and 6 fold increase in productivity was targeted by 2015 and 2020 respectively compared to the level in 2009. Applying these to the key staples below, we observe that 2015 yields are far below levels required for overall productivity to have tripled by 2015 and further increase by 2020.

### **3.5 Challenges and prospects of achieving the Agriculture Promotion Policy**

The Nigerian rural economy is still faced with the challenge of subsistent farming. This affects the inability to meet domestic food requirements in rural Nigeria. Although there is a provision for private partnership in this regard, the policy has not stated in clear terms how the vulnerable rural poor will be able to access farming support programmes without collaterals. Access to support to enhance commercialization by rural farmers has always and still is a challenge in achieving the Nigeria Promotion Policy. Subsistence farming is no longer a solution, Nigeria has to commercialize agricultural production and fully adopt mechanize farming. In addition, mechanization of the agricultural industry is the way out of solving Nigeria's problem. This can be achieved by matching up human input with mechanization, bringing in machinery and increase the scale of production, so that



whatever the rural sector produces, it will match the population growth rate.

#### **4.0 CONCLUSION**

The Nigerian rural sector depends on a wide range of agricultural products in almost all aspects of life. It is a key economic driver. It is central to individual livelihoods and alleviates poverty. Provider of energy fuel-wood and medical plants, it helps in Nations economic growth.

#### **5.0 SUMMARY**

In this unit, we have learnt about:

- some of the planned agricultural programmes in the vision 2020
- the various important roles of the agricultural sector
- the challenges facing the agricultural sector

#### **6.0 TUTOR-MARKED ASSIGNMENT**

- 1 Discuss the importance of agriculture in forest and wildlife conservation
- 2 List and discuss challenges facing the agricultural sector

#### **7.0 REFERENCES/FURTHER READING**

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## **UNIT 5      UNIVERSITIES/COLLEGES AND TECHNICAL SCHOOLS**

### **CONTENTS**

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
  - 3.1 Education Input
  - 3.2 The “Sustainable” University
  - 3.3 Campus as an “Ecosystem”
  - 3.4 Roles
  - 3.5 Lack of Interest
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

### **1.0      INTRODUCTION**

It is incontrovertible that for any sustainable development to be achieved by any nation, the educational sector (especially Higher Education) must play a significant and critical role. This sector is expected to provide human capacity with leadership roles that will meet the challenges of stimulating sustainable development and the democratization of knowledge. Universities, we argue, hold a particular unique influence on society in that they train and educate people and because they participate in governance at the national and regional level. Hence, they represent pivotal socio-cultural settings for practical change in navigation towards a more sustainable future.

### **2.0      OBJECTIVES**

At the end of this unit, you should be able to:

- discuss the effect both positive and negative effect of tertiary institutions on biodiversity effort
- explain the role of the students in biodiversity conservation.

### **3.0      MAIN CONTENT**

#### **3.1      Education Input**

The education sector in totality is not faring better as there is an annual inadequate and inconsistent budgetary allocation distributed as

subvention or grants to the different levels of education through coordinating agencies of education e.g. National Universities Commission (NUC).

### **3.2 The “Sustainable” University**

Entrepreneurial Universities are important governance actors in promoting sustainable development goals since they provide expertise, knowhow and contribute to regional development. Universities could therefore play a role to make these goals possible in education, research, policy formation and information exchange. As a community the role of the university in advancing the sustainability agenda cannot be underestimated since it is often recognized that achieving societal change is best pursued at the level of groups and local communities.

### **3.3 Campus as an “Ecosystem”**

University and college campuses often cover quite large tracts of land, in some cases even containing golf courses. There are ample evidence showing that natural areas can enhance students’ authentic learning opportunities of biodiversity. Schools, colleges and universities are settings with a potential to offset the present human disconnection of nature and instead restore the emotional affinity with nature. Hence, the natural areas of the university campus can be regarded as a place where learning occurs.

### **3.4 Roles**

Universities/Technical Schools; conducts research on the control and management of species under in situ and ex situ conservation methods and train manpower for the execution of conservation programmes of government.

### **3.5 Lack of Interest**

Although many Colleges or universities have programs for the study of biodiversity conservation, many students do not see the great potential in forest and wildlife resources. Hence they do not like studying courses in Universities or Colleges that focuses on forest and wildlife resources. So lack of interest poses a serious barrier on Colleges and Universities in promoting conservation efforts.

## 4.0 CONCLUSION

This unit has focused on what role higher educational institutions could play in reconnecting people to the biosphere; Universities could play a much more active role as change agents for sustainability in different cultures and contexts. Given their pivotal role in society and the potential for mutual learning, higher education platforms have a unique potential to catalyze “multipliers of sustainability impacting on a societal transition towards sustainability.

## 5.0 SUMMARY

In this unit, we have learnt about:

- the beneficial as well as the negative effect of Universities and Colleges in forest and wildlife resources conservation.
- the challenges facing Universities and Colleges in biodiversity conservation

## 6.0 TUTOR-MARKED ASSIGNMENT

1. List all the benefit of tertiary institutions in biodiversity conservation
2. Explain the challenges the tertiary institutions are facing.

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