POL326
ENVIRONMENTAL POLITICS

COURSE WRITER

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MODULE 1: THE ENVIRONMENT

UNIT 1 PRINCIPLES, AIMS AND SCOPE OF ENVIRONMENTAL POLITICS

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1.0 INTRODUCTION

The level and pace of socio-economic advancement in the world today has important implications for the efficacy with which legislature and institutional regimes are developed and applied for the promotion of environmental management. In the developing countries, particularly, the imperatives of rapid social and economic development could influence the political will to initiate, implement and enforce appropriate environmental policies and laws. These development imperatives often circumscribe the limits of resources available for environmental protection. The implementing agencies often operate under severe resource constraints and, the relatively low level of public awareness, particularly environmental awareness does little to trigger a sense of urgency and resolve for political and legislative action for environmental management for sustainable development. In the absence of familiarity with environmental legislation and the environmental impacts of human activities there is likely to be no spontaneous observance of normative demands for efforts at environmental protection and enhancement. In the last instance, the desire to satisfy basic social needs could very well override even basic environmental considerations.

From the fore-going, the main aim of this course is to develop the critico-creative thinking habit of the learners about issues relating to the environment. This is with the view of explaining the rationale for government involvement in environmental issues, and be able to discuss the impact of such involvement.

2.0 OBJECTIVES

At the end of the unit, learners should be able to

- define and explain basic concepts such as the environment, natural resources, environmental assets, biodiversity, and environmental politics; and
- discuss the scope of environmental politics as an academic discipline.

3.1 DEFINITIONS OF BASIC CONCEPTS

To start with, let us familiarise ourselves with this course “Environmental Politics” by understanding the meaning of certain concepts and terms that are contained therein.

3.1.1 ENVIRONMENT

The "environment" is everything that creates natural conditions of the existence of organisms including man, and it is a precondition of their further development. Its components are mainly the air, water, minerals, soil, and living organisms. These can be grouped broadly into two classes as: abiotic and biotic components.

3.1.2 NATURAL RESOURCES

Natural resources are defined as naturally occurring substances that are considered valuable in their relatively unmodified forms. Examples include petroleum, gas, sand and gravel.

3.1.3 ENVIRONMENTAL ASSETS

These include the components of the natural environment that we wish to conserve or use sustainably such as land, water, biodiversity (plants and animals), and the atmosphere. It can also refer to more specific natural assets such as a threatened species or a wetland.

It is important to note that our environment is well endowed with naturally-occurring assets, from soil and rocks to majestic landscapes and a wide variety of vegetations and animals. Rivers and streams also play an important role in defining “our environment”. Some of these are in good condition and are worthy of protection, whilst many have become degraded and require a helping hand.

3.1.4 MANAGEMENT ACTIONS

These are actions that can support the continuing management of natural assets in good condition, or that will lead to improvement in the condition of natural assets that need help. Triple bottom line is a phrase used to communicate the need to take into account all the social, economic and environmental considerations when assessing management options. It is becoming more frequently used in policy and strategy documents.

3.1.5 BIODIVERSITY

Biodiversity is the variety of all life forms. It is the sum total of all species of plants and animals, their inherent genetic makeup, and the ecosystems that support the communities of interdependent species. Environmental Services (alternatively called Ecosystem Services) refers to the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life.

Biodiversity contributes to scenery, diversity and recreational opportunities within an area, whether recognised or not. Thus, there are strong social ties to biodiversity at a geographical level. Some elements of biodiversity are utilised for economic benefits, ranging from timber extraction and sawmilling to honey production and bush tucker foods.

3.1.6 ENVIRONMENTAL JUSTICE

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. A condition of environmental justice exists when environmental risks and hazards and investments and benefits are equally distributed with a lack of discrimination, whether direct or indirect, at any jurisdictional level; and when access

to environmental investments, benefits, and natural resources are equally distributed; and when access to information, participation in decision making, and access to justice in environment-related matters are enjoyed by all.

3.1.7 ENVIRONMENTAL FREEDOM

Environmental freedom implies the rights of individual as provided by nature.

3.1.8 ENVIRONMENTAL RISK

Risk has quite a number of meanings. It can be interpreted to mean the potential for realization of unwanted, negative consequences of an event. Risk may also be defined as the probability of an adverse outcome or the downside of a gamble (the total gamble must be considered). Judging from these perspectives, it is safe to say that "safe" means "without risk". However, we should understand that there is usually no such thing as zero risk.

3.2 THE SCOPE OF ENVIRONMENTAL POLITICS

Environmental Politics is concerned with four particular aspects of the study of environmental politics, with a primary, though not exclusive, focus on the industrialised countries. First, it examines the evolution of environmental movements and parties. Second, it provides analysis of the making and implementation of public policy in the area of the environment at international, national and local levels. Third, it carries comment on ideas generated by the various environmental movements and organisations, and by individual theorists. Fourth, it aims to cover the international environmental issues, which are of increasing salience. Environmental Politics is sensitive to the distinction between goals of conservation and of a radical reordering of political and social preferences, and aims to explore the interface between these goals, rather than to favour any one position in contemporary fields.

As with any analysis or intervention, where you start has a lot to do with where you end up. Concerns for peace, security and economic prosperity led to familiar concepts in international relations-balance of power and gains from trade, for instance. Thus, the primary starting points for environmental politics include the following:

- Concern for irreversible diminution of the earth's life support systems;
- Concern for the consequences of ever-increasing throughput of material and energy as means of satisfying publics and resolving (or avoiding) conflicts; and
- Concern for the injustices of uneven distribution of environmental benefits and harm.

These concerns are in turn informed by an understanding of the nature of the global environmental problems which are both biophysical and social. On the biophysical side, environmental politics theory starts with phenomena such as threshold and synergistic effects, and multiple spatial and temporal scales. On the social side, and in parallel to the biophysical problem, studies start with explicit assumptions about human behaviour. These should include the human ability to do the following:

- deal with limited predictability and, hence, the necessity of accepting limited human control of natural systems;
- engage the environment as life-support system rather than as amenity (or luxury good);
- make long-term decisions, projecting into the distant past, both historically and biogeochemically, and into the far future, including ecologically meaningful futures (e.g., those of nutrient, water, and life cycles).

4.0 CONCLUSION

Drawing on examples from both the developed and the developing countries, we have been able to identify and examine the networks among actors and organisations that connect local mobilizations

to the larger environmental movement and political systems, the ways in which local disputes are framed in order to connect with national and global issues, and the persistent impacts of the peculiarities of place upon environmental campaigns.

5.0 SUMMARY

In this unit, we have learnt that:

- Biodiversity is the variety of all life forms.
- Environmental Services, also referred to as 'Ecosystem Services', refers to the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life.
- Environmental freedom implies the rights of individual as provided by nature.
- There are four aspects of Environmental Politics:
    - examination of the evolution of environmental movements and parties;
    - provision of analysis of the making and implementation of public policy in the area of the environment at international, national and local levels;
    - transfer of comment on ideas generated by the various environmental movements and organisations, and by individual theorists; and
    - covering of the international environmental issues which are of increasing salience.
- The primary starting points for environmental politics should include the concern for:
    - irreversible diminution of the earth's life support systems;
    - the consequences of ever-increasing throughput of material and energy as means of satisfying publics and resolving (or avoiding) conflicts; and
    - the injustices of uneven distribution of environmental benefits and harms.

6.0 TUTOR-MARKED ASSIGNMENT

Define four basic concepts in environmental politics and briefly discuss its scope.

7.0 REFERENCES / FURTHER READINGS

Bob Edwards (1995) "With Liberty and Justice for All: The Emergence and Challenge of Grassroots Environmentalism," in Bron, R. T. (ed.), *Grassroots Resistance: The Global Emergence of Popular Environmental Rebellion.* Albany: Suny Press.

Carolyn, M. (1992) *Radical Ecology: The Search for a Liveable World*. New York: Routledge, Chapman & Hall.

Michael, E. K. (1996) *Environmental Policy and Politics: Toward the Twenty-First Century*. New York: HarperCollins.

UNIT 2 ENVIRONMENTAL RESOURCES

CONTENTS

1.0 INTRODUCTION

Environmental resources are not evenly distributed in space. The most highly developed nations enjoy material standards inconceivable to their forebears at the turn of the century, and still well beyond much of the rest of the world. Much of this is due, not simply to greater exploitation of the world's resources, but to more efficient systems of exchange, leading to better allocation of resources. This can be seen by considering how easily a country can collapse when its economic system fails to function, despite a super-abundance of resources.

However, owning a lot of resources may not ensure prosperity, unless at the same time there is a system of resource allocation available to make efficient use of these. Because of concerns about long term sustainability of environmental resources, therefore it is necessary to reconsider some of the ways in which resources are allocated.

In dealing with reproducible stocks of assets produced by humans, such as buildings, infrastructure, plant and equipment, we know that what is destroyed or wrongly constructed can eventually be replaced or corrected. There are four groups of characteristics shared by many environmental resources which create particular difficulties for allocative systems when we consider questions of sustainability. These can be summarised as follows:

- irreversibility
- uncertainty
- market externalities
- absence of property rights.

2.0 OBJECTIVES

At the end of the unit, students should be able to

- itemise the components of the environment;
- identify and classify natural resources according to their characteristics; and
- discuss the replenishing attributes of environmental resources.

3.0 MAIN CONTENT

3.1 COMPONENTS OF THE ENVIRONMENT

Components of the environment are mainly the air, water, minerals, soil, and living organisms. These can be grouped broadly into two classes as: abiotic and biotic components

3.1.1 ABIOTIC COMPONENTS

These are the non-living components of the environment

- atmosphere
- hydrosphere
- lithosphere
- biosphere

Atmosphere

The atmosphere of the Earth serves as a key factor in sustaining the planetary ecosystem. The thin layer of gases that envelops the earth is held in place by the planet's gravity. The atmosphere retains heat during the night, thereby reducing the daily temperature extremes. Table 2.1 contains the composition of the atmosphere by volume (in descending order).

Table 2.1: Components of the Atmosphere

Gas Name	Volume	Chemical Formula
Nitrogen	78.08%	N_2
Oxygen	20.95%	O_2
Water vapour∗	0 to 4%	H_2O
Argon	0.93%	Ar
Carbon Dioxide∗	0.0360%	CO_2
Neon	0.0018%	Ne
Helium	0.0005%	He
Methane∗	0.00017%	CH_4
Hydrogen	0.00005%	H_2
Nitrous Oxide∗	0.00003%	N_2O
Ozone∗	0.000004%	O_3

∗ Variable Gases

Source:

In sum,

- Nitrogen and oxygen are the main components of the atmosphere by volume and these two gases make up approximately 99% of the dry atmosphere
- Oxygen is used and reused by green plant and man
- Water vapour varies in concentration in the atmosphere both spatially and temporally
- Carbon dioxide has increased due to human induced burning from fossil fuels, deforestation, and other forms of land-use change
- The average concentration of the greenhouse gas nitrous oxide is now increasing at a rate of 0.2 to 0.3% per year
- The ozone layer of the earth's atmosphere plays an important role in depleting the amount of ultraviolet (UV) radiation that reaches the surface.

Hydrosphere

The hydrosphere refers to the body of water on the earth's surface. An ocean is a major body of saline water, and a component of the hydrosphere. Approximately 71% of the earth's surface (an area of some 361 million square kilometers) is covered by water. Hydrosphere includes both the flowing and stagnant water bodies such as oceans, seas, lakes, creeks, lagoons, rivers and streams. An ocean is a continuous body of water that is customarily divided into several principal oceans and smaller seas. The major oceanic divisions are (in descending order of size) the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean (which is sometimes subsumed as the southern portions of the Pacific, Atlantic, and Indian Oceans), and the Arctic Ocean (which is sometimes considered a sea of the Atlantic). The Pacific and Atlantic may be further subdivided by the equator into northerly and southerly portions. Smaller regions of the oceans are called seas, gulfs, bays and other names. There are also salt lakes, which are smaller bodies of landlocked saltwater that are not interconnected with the World Ocean. Two notable examples of salt lakes are the Aral Sea and the Great Salt Lake.

A river is a natural watercourse, usually freshwater, flowing toward an ocean, a lake, a sea or another river. In a few cases, a river simply flows into the ground or dries up completely before reaching another body of water. Small rivers may also be called by several other names, including stream, creek, brook, rivulet, and rill; there is no general rule that defines what can be called a river. Many names for small rivers are specific to geographic location; one example is Burn in Scotland and North-east England. A river is part of the hydrological cycle. Water within a river is generally collected from precipitation through surface runoff, groundwater recharge, springs, and the release of stored water in natural ice and snowpacks (i.e., from glaciers).

A lake (from Latin lacus) is a terrain feature (or physical feature), a body of liquid on the surface of a world that is localized to the bottom of basin. Natural lakes on the earth are generally found in mountainous areas, rift zones, and areas with ongoing or recent glaciation. Other lakes are found in endorheic basins or along the courses of mature rivers. In some parts of the world, there are many lakes because of chaotic drainage patterns left over from the last Ice Age. All lakes are temporary over geologic time scales, as they will slowly fill in with sediments or spill out of the basin containing them.

Lithosphere

The earth's crust, or continental crust, is the outermost solid land surface of the planet, is chemically and mechanically different from underlying mantle, and has been generated largely by igneous processes in which magma (molten rock) cooled and solidified to form solid land. Plate tectonics, mountain ranges, volcanoes, and earthquakes are geological phenomena that can be explained in terms of energy transformations in the earth's crust.

Biosphere

Although there is no universal agreement on the definition of life, scientists generally accept that the biological manifestation of life is characterized by organization, metabolism, growth, adaptation, response to stimuli and reproduction. Life may also be said to be simply the characteristic state of organisms. Properties common to terrestrial organisms (plants, animals, fungi, protists, archaea and bacteria) are that they are cellular, carbon-and-water-based with complex organization, having a metabolism, a capacity to grow, respond to stimuli, and reproduce. An entity with these properties is generally considered life. However, not every definition of life considers all of these properties to be essential. Human-made analogs of life may also be considered to be life.

The biosphere is the part of earth's outer shell - including air, land, surface rocks and water - within which life occurs, and which biotic processes in turn alter or transform. From the broadest geophysiological point of view, the biosphere is the global ecological system integrating all living

things and their relationships, including their interaction with the elements of the lithosphere (rocks), hydrosphere (water), and atmosphere (air). Currently the entire Earth contains over 75 billion tons (150 trillion pounds) of biomass (life), which lives within various environments within the biosphere.

3.1.2 BIOTIC COMPONENTS

These are the living components of the environment: plants, animals and micro-organisms. These components can be categorised further as:

- producer
- consumer
- de-composer

3.2 CLASSIFICATION OF ENVIRONMENTAL RESOURCES

In order to understand exactly why environmental resources create problems for systems of exchange, a good place to start is by classifying environmental resources according to their allocative characteristics. Environmental resources can be sorted on the basis of the following three sets of criteria.

3.2.1 Renewability and Non-renewability

If the rate of regeneration of any environmental resource is significant, we can classify that resource as being renewable. Otherwise, it is classified as non-renewable. A non-renewable environmental resource is simply a finite stock, which can never be replenished. Any use of that stock will always diminish the level that remains. There is no such thing as a sustainable rate of use of a non-renewable stock.

3.2.2 Exhaustibility and Non-exhaustibility

The distinction between exhaustible and non-exhaustible renewable resources has crucial implications for allocative systems. It relates to the way in which a resource is made available to us, and the way in which we can use it. Some renewable resources, such as wind, tidal and solar flows, are strictly "non-exhaustible". Whatever demands humans make on them, they cannot use these environmental resources up.

Part of the reason for this non-exhaustible characteristic is that use of supplies of this type of resource by one group of people does not preclude other groups from benefiting from the same supply of the resource. Whatever the level of human demands on them, their availability cannot be affected by exhaustion. There is therefore no need to be concerned about regulating access to or use of this type of resource, because in economic terms it is not scarce.

3.2.3 Sustainability

These are resources, which are both renewable and exhaustible. It is with this type of environmental resource that we have the choice of selecting a rate of usage, which will allow us to consume supplies for an indefinite period, or a rate, which will result in the disappearance of the resource within the near future. This category of environmental resources is made available to us as a flow from a renewable but exhaustible terrestrial environmental stock. The phrase "harvesting the stock" is often used to illustrate that we are making use of a yield from the stock that can be replenished. The rate at which we decide to harvest the yield of any renewable but exhaustible environmental stock will determine whether we actually exhaust it. If we take too large a harvest, then the stock is likely to diminish to the point that it may become non-viable and disappear for good.

3.3 REPLENISHMENT OF ENVIRONMENTAL RESOURCES

Some forms of environmental resources can be replenished in relatively short periods through physical as well as biological processes. Physical processes of replenishment are important, for example, in dealing with soil structures and fertility levels, aquifers, the earth's atmosphere and ozone layer, and the assimilative and waste processing capacities of our environmental systems. All these types of renewable but exhaustible environmental resources have a physical capacity for renewal. This distinguishes them from environmental resources in which the capacity for renewal is purely or predominantly biological, such as fish stocks and forests, and other flora and fauna and their related ecosystems. In terms of allocative problems, exhaustible resources for which physical as well as biological renewal are possible should prove more resilient to the demands humans place on them. They should offer a greater margin of warning about unsustainable levels of use, so that systems of resource management, which are inadequate, can be spotted and improved before irretrievable damage occurs. It does not follow that these warning signs will be acted upon, even when we are dealing with this more resilient category of exhaustible environmental resource. However, if an exhaustible environmental resource only has a biological capacity for renewal, the margins of warning are likely to be less generous, and the signs of exhaustion are likely to be far more difficult to reverse. For this reason, the shortcomings of our systems of exchange when allocating environmental resources are likely to be felt most keenly, and create most concern, in those categories of environmental resources the sustainability of which is most vulnerable to exhaustion.

Suppose we apply the same trial and error approach to the use of exhaustible environmental assets. Because of the nature of such resources, we might find ourselves in serious trouble. If the decision we take is wrong, and we incorporate a major error of judgement, we might completely wipe out our stock of the environmental asset, with no possibility ever of replacing it. Under these circumstances, the penalties faced by not only ourselves but future generations for making wrong judgements about such resources seems to be much too high to leave it to trial and error. A similar problem applies in the decisions we take about depleting non-renewable resources. If we choose too high a rate of depletion, we may end up running out of essential supplies of non- renewable resources before we have the opportunity of developing sustainable substitutes, and there would be little we could do about this. The market rewards for successful judgements and penalties for wrong decisions when applied to environmental resources seem to be rather ineffective when the decisions involve irreversible changes in resources.

4.0 CONCLUSION

In this lecture, we have seen how a classification of environmental resources according to their allocative characteristics can help us understand why they pose difficulties for any allocative management systems. This led us to draw two overall conclusions:

- firstly, that simple reliance on market mechanisms to ensure sustainable use of environmental resources is likely To prove unsuccessful, and to produce results which may be both damaging an` irreversible; and
- secondly, that the absence of any form of property rights or ownership is also likely to encourage unsustainable use of environmental resources.

5.0 SUMMARY

In this unit, we have learnt that:

- the environment consists of both the biotic and the abiotic components;
- environmental resources can be sorted on the basis of the following three sets of criteria: renewability, exhaustibility and sustainability.
- some resources are both renewable and exhaustible.
- some forms of environmental resources can be replenished in relatively short periods of time through physical as well as or instead of biological processes.

- the market rewards for successful judgements and penalties for wrong decisions when applied to environmental resources seem to be rather ineffective when the decisions involve irreversible changes in resources.
- as we destroy our highly structured material resources to create economic growth, so we increase the planet's entropy levels.
- a principle is increasingly being adopted by policy makers in taking allocative decisions which involve environmental resources that are non-renewable or exhaustible.

6.0 TUTOR-MARKED ASSIGNMENT

Make a list of the resources in your state and describe the most appropriate method for managing each of them.

7.0 REFERENCES / FURTHER READINGS

Anderson, J.; Gauthier, M.; Thomas, G. and Wondolleck, J. (1996) "Setting the stage. Presented at the Global e-Conference on Addressing Natural Resource Conflict Through Community Forestry, Jan–Apr 1996". *Forests, Trees and People Programme of the Food and Agriculture Organization of the United Nations*, Rome, Italy.

Eberlee, J. (1999) "Alternative approaches to managing conflict over natural resources". *IDRC Reports*, 278, pp. 1–5.

UNIT 3 QUALITY AND PLANNING OF THE ENVIRONMENT

CONTENTS

1.0 INTRODUCTION

The term environment is all-encompassing. It is the entire surroundings of man, made up of both living and non-living components. Living components include plants and animals in their various forms, while non-living components include the air, water bodies, landscape, built up areas, infrastructures, etc. Environmental management simply refers to man's application of scientific, technical and social knowledge and skills in managing all components of the environment to ensure that the environment is not stressed beyond its productive capacity at any given time. The concept of managing the environment such that it can continue to provide basic needs and services for the present and future generations is referred to as sustainable environmental management.

There are many challenges in the task of managing the environment. Generally, people tend to look at the environment as God-given and feel that there is no need to care for it. In the struggle for survival and development, man creates many negative impacts on the environment. These impacts range from over-exploitation of resources, destruction of ecosystem, to air and water pollution problems. For instance, deforestation, indiscriminate bush burning, land mass clearing for agriculture or for urban development and mining activities can all lead to soil erosion, flooding and water pollution. On the other hand, gaseous emission and discharge of effluents from manufacturing industries can cause serious pollution of air and water. Severe soil erosion can impoverish rich land, resulting in poor agricultural yield while water pollution can negatively affect fish production in our rivers. In Lagos, for example, people talk about "odo aro" (meaning purple-coloured river). This is because of liquid waste discharged from neighbouring industrial plants into the river, which change the colour and chemical composition of the river, thereby making it inhabitable for many aquatic organisms.

2.0 OBJECTIVES

At the end of the unit, learners should be able to:

- explain the environmental planning process;
- assess the quality of their immediate environment;
- highlight the qualities of a good environment; and
- appreciate the need for a quality environment.

3.0 MAIN CONTENT

3.1 ENVIRONMENTAL PLANNING

The first step towards a successful achievement is planning. Thus, our discussion on environmental quality shall begin with an overview of environmental planning.

Environmental planning seeks to improve and protect environmental quality- for both the urban residents and rural dwellers, although the focus is usually on the urban environment- both through controlling the generation of pollution and through segregating activities that are environmentally incompatible (Miller and Roo, 1997). The organizational structure involved in environmental planning is as summarized in Figure 3.1.

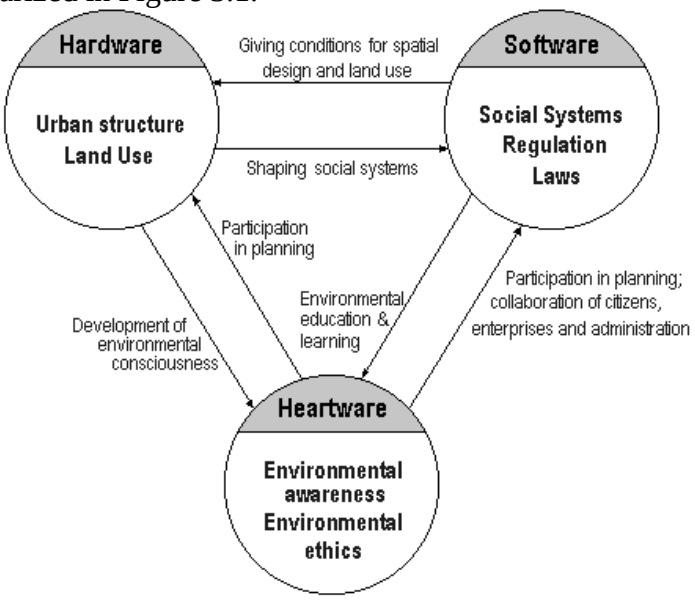


Fig 3.1: Organizational Structure in Environmental Planning
Source: Harashina (1996), p. 14

Effective environmental planning requires the effective interaction and overlay between three components - hardware, software and heart-ware.

- **Hardware** consists of the physical fabric of a city - infrastructure, buildings, railway, roads, ports etc.

- **Software** consists of sets of rules, and regulations, laws and legislation, ordinances, including habits, ethics, and traditionally established codes of conduct.

- **Heart-ware** is an individual's emotional mechanism, behaviour and conduct, which determines his or her needs, wants and wishes. It also determines the process by which the individual's interaction with the surrounding environment takes place.

3.2 ENVIRONMENTAL QUALITY

The world, particularly, the urban centres today are beset with environmental crises due to urbanization and unplanned development. Although various strategies have been evolved to deal with the problems, the menace of urban decay is still on the increase. One of the major factors accounting for this is the apparent neglect of urban renewal strategy. This unit recommends fundamental requirements for comprehensive urban renewal as a veritable means of improving, environmental quality in Nigerian cities.

Man's survival depends on the environment. The environment includes all the external and non-personal conditions and influences that affect the welfare of people in a given area. In other words, the development or growth of a community is influenced by good environmental quality. Good environmental quality refers to the physical environment of the urban or rural area, which tends to induce in residents a feeling of sound, mental, emotional and physical well-being to the extent at which needs and wants are satisfied. Good environmental quality is not just housing and its ancillary facilities, but a place where the people should be able to live in dignity, security and harmony with all the great achievements of modern civilization and the pleasures offered by natural beauty made available to all. A good environmental quality is one:

- where housing units are available for people at different income levels;
- that is free of anything that constitutes a nuisance like air or water pollution; and
- that has clean surroundings, which enhance good health.

The quality of the environment depends on the extent of planning and control of city development, the quality of building and housing, infrastructural development and the standard of public health service and facilities. It is pertinent to mention that this is the objective of urban renewal. The fundamental objective of urban renewal is the application of several principles resulting in the revitalization of any or all portions of the urban structure that are blighted.

Urban renewal is a system of preventing the premature obsolescence of an urban neighbourhoods and facilities for the restoration of declining areas as well as the re-creation of worn out areas. In effect, it means the demolition of old and decaying properties and their replacement by the construction of new buildings, streets and parks. Robert (1992) defines urban renewal to represent an aggregate of public and private activities, which retard or terminate urban obsolescence, prevent decay, clear areas, which have 'gone too bad and upgrade buildings, facilities and environment in order to restore life.

3.3 ENVIRONMENTAL CHALLENGES

A common challenge in our cities is the problem of solid wastes management as most parts of our urban centres are littered with heaps of dirt. Usually, the drainage systems are blocked, resulting in flooding of many access roads. Sources of urban wastes include homes, hotels, restaurants, hospitals, markets, motor-parks, and commuters in moving vehicles. Littering with nylon and sweet wrappers are a common sight in urban streets. In Singapore, you would not see sweet wrappers; sweets are

adorned with flowers. Urban waste management demands a lot of financial input for the provision of appropriate machinery and work force requirement, which the government most often cannot afford. The people on their part, have not shown the required commitment towards integrated waste management strategies, which includes waste reduction, sorting, recycling and responsible behaviour along our streets.

Our prospect is to have a Nigerian population that is adequately aware of our environmental problems and sees the need to address these problems collectively. We want to be able to encourage participation of all stakeholders in the task of environmental management, developers, the civil society, non-governmental organizations, communities, special interest groups (women and youths) etc. In particular, greater emphasis is being placed on community participation because the local communities are the main custodians of our environmental resources. It is in this regard that a number of community-based projects were initiated. One of such is the Community Herbal Heritage Centres, which has now been spread across the various ecological zones in Nigeria. For example, to be able to participate effectively in the business of environmental management, they need to have access to credible information about the status, problems and prospects of our environment as well as strategies for addressing the problems. In this regard, a national strategy for environmental education and public awareness was developed while appropriate structure for facilitating public access to environmental information in Nigeria have also been put in place. In addition, there are environmental conservation clubs in many of our schools while we also have Desk Officers for environment information delivery in all states of the federation.

Very large development projects - megaprojects - pose special challenges and risks to the natural environment. Major dams and power plants are cases in point. The challenge to the environment from such projects is growing because more and bigger megaprojects are being built, in developed and developing nations alike.

4.0 CONCLUSION

The natural environment, commonly referred to simply as the environment, is a term that encompasses all living and non-living things occurring naturally on Earth or some region thereof. The concept of the natural environment can be distinguished by components:

- Complete ecological units that function as natural systems without massive human intervention, including all vegetation, animals, microorganisms, soil, rocks, atmosphere and natural phenomena that occur within their boundaries.
- Universal natural resources and physical phenomena that lack clear-cut boundaries, such as air, water, and climate, as well as energy, radiation, electric charge, and magnetism, not originating from human activity.

The natural environment is contrasted with the built environment, which comprises the areas and components that are strongly influenced by humans. A geographical area is regarded as a natural environment (with an indefinite article), if the human impact on it is kept under a certain limited level.

5.0 SUMMARY

In this unit, we have learnt that:

- effective environmental planning requires the effective interaction and overlay between three components - hardware, software and heart-ware;
- the urban centres today are beset with environmental crises due to urbanization and unplanned development;
- urban renewal is a veritable means of improving, environmental quality in Nigerian cities;
- urban problems have led to the need for urban renewal in order to promote good urban image;
- characteristics of a good environmental quality should include availability of housing units at different income levels, pollution-free, and clean surroundings, which enhance good health;

- it is the common understanding of natural environment that underlies the advocates for various actions and policies in the interest of protecting what nature remains in the natural environment, or restoring or expanding the role of nature in this environment; and
- mega development projects pose special challenges and risks to the natural environment.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the rationale for good environmental quality.

7.0 REFERENCES / FURTHER READINGS

Adams, S. and David, L. (2006) *Earth Science: An illustrated guide to science.* New York: Chelsea House.

Harashina, S. (1996) "Environmental Planning on Urban Level". *Discussion Paper, 96-6*. Tokyo: Department of Social Engineering, Tokyo Institute of Technology.

Miller, D. and Gert de Roo (1997) *Urban Environmental Planning*. Avebury Publishers.

Odum E. P. (1971) *Fundamentals of ecology, third edition.* New York: Saunders

Oldroyd, D. (2006) *Earth Cycles: A historical perspective*. Westport: Greenwood Press.

Smith, G. A. and Aurora, P. (2006) *How Does the Earth Work?* Upper Saddle River: Pearson Prentice Hall.

UNIT 4 ENVIRONMENTAL POLICY

CONTENTS

1.0 INTRODUCTION

Environmental policy is a declaration on intentions and principles related to total environmental profile, which provides framework for activities and for determination of environmental goals and target values. Environment protection policy is a written declaration on principles and intentions in this sphere. It takes up a quality policy, provides framework for activities in the sphere of environment protection. It is declared by the General Director and it is available for company's employees and public on the notice board of the company.

Recent research on the links between pollution regulation and environmental innovation suggests that environmental policy may not sufficiently explain the recently observed trends in environmentally beneficial technological innovation. It is now apparent that pollution control innovations are determined by a complex web of additional interacting factors.

Generally speaking, environmental regulation in Africa remains relatively weak while there is insufficient institutional capacity to deal with environmental pollution problems. Even South Africa with relatively advanced manufacturing had not established a comprehensive programme of industrial pollution control until the second half of the 1990s. However, Nigeria appears to be an

exception to the general African situation. In 1988, the government of Nigeria established a Federal Environmental Protection Agency (FEPA) to oversee and manage environmental regulatory processes in Nigeria. Industrial pollution control, which had previously been carried out on a rather ad hoc basis, thus came under the purview of FEPA. Despite this, policy approach in dealing with industrial pollution in Nigeria has been mainly "command and control" in nature.

2.0 OBJECTIVES

At the end of the unit, students should be able to

- discuss the influence of environmental politics on human activities; and
- explain the considerations involved in the negotiation and implementation of effective governance strategies for the harmonization of the environment.

3.0 MAIN CONTENT

3.1 THE NEED FOR ENVIRONMENTAL POLICY

Theoretical models linking environmental policy and environmentally benign technological innovation are limited in their empirical applications. Such models adopt the neo-classical view of environmental policy as being the stimulus for environmentally benign technical change, and in the process assume of other pertinent factors that have been demonstrated from empirical studies as playing important roles in stimulating environment-friendly innovations. The focus in these theoretical viewpoints is not on the kind of technical change induced by policy, but rather the kind of policy or optimal mix of policies that could achieve a predetermined level of environmental quality or pollution reduction.

The past few years have witnessed the development of theoretical and empirically tested propositions which emphasize environmental policy as an insufficient impetus for green innovation in many instances. Among such propositions, Michael Porter's hypothesis that environmental regulation can create technological offsets, yielding economic benefits that write off the cost of compliance with environmental policy, is of particular importance. These propositions have been extended to suggest "win-win" solutions yielding double dividends that benefit both private and social parties. Some have even suggested a triple dividend that includes increased employment. Thus, the notions of double-triple-dividend suggest that the incentive to adopt green innovation may arise from a desire to attend to socioeconomic benefits rather than the compelling force of the environmental policy.

The effectiveness of environmental policy alone as a stimulus to green innovation has been questioned in various quarters. Environmental policy is necessary to make firms appreciate and perhaps accept responsibility for the external diseconomies of their production activities; the factors determining the implementation of environmentally benign technical change largely transcend the traditional notion of environmental policy as the stimulus for innovation in pollution control.

3.2 ENVIRONMENTAL POLICY IN THE DEVELOPING COUNTRIES

Studies on environmental regulation and industrial pollution control in developing countries rarely focus on the impact of environmental policy on technology responses of firms. Rather, the focus is usually on the impact of policy on emission reduction or pollution abatement expenditures (e.g. Aden, Kyu-hong and Rock, 1999). Though emission reduction would be impossible without technological application or change in production practices aimed at pollution abatement, the neglect of direct analysis of the technological or innovation impact of policy limits our understanding of all the factors that determine the actual emission reduction achieved. Technology is the medium through which emission reduction effects are accomplished. When the searchlight is focused on this medium, we may gain a more comprehensive perspective on the interplay of factors that interact with technology to generate the emission reduction effects.

Environmental policy in the developing countries has never been, and may not in the near future be expected to be, as stringent as in the industrialised countries. Hence, when environmental technologies are observed among firms in the former, it is plausible to suggest that there may be other "third party" factors (apart from environmental policy) that drive firms' green innovation behaviour. Decoupling these factors from environmental policy is, however, difficult since environmental policy provides the basic guidelines for the firms' technological responses.

Theoretical ideas that focus on environmental policy may appear more of a luxury to developing countries that are still in search of relevant paths and appropriate strategy for industrialization. Many developing countries lack the appropriate institutional context for developing and managing elaborate environmental policy instruments such as pollution taxes and tradable emission permits. Most developing countries are thus forced to adopt command and control strategies and resort to regulatory means that may not go beyond specifying emission limits and technology standards to be adopted to ensure compliance.

4.0 CONCLUSION

Environmental policy is regarded as the main driver for industrial innovations that reduce external diseconomies of industrial production in both developed and developing countries. In Africa, environmental policy is relatively weak and there is insufficient institutional capacity to deal with environmental pollution problems.

While environmental policy is necessary to make firms appreciate and perhaps accept responsibility for the external diseconomies of their production activities, the factors determining the implementation of environmentally benign technical change largely transcend the traditional notion of environmental policy as the stimulus for innovation in pollution control.

5.0 SUMMARY

In this unit, we have learnt that:

- Theoretical models linking environmental policy and environmentally benign technological innovation are limited in their empirical applications.
- The focus of the theoretical viewpoints is not on the kind of technical change induced by policy, but rather the kind of policy or optimal mix of policies that could achieve a predetermined level of environmental quality or pollution reduction.
- Environmental policy is necessary to make firms appreciate and perhaps accept responsibility for the external diseconomies of their production activities. The factors determining the implementation of environmentally benign technical change largely transcend the traditional notion of environmental policy as the stimulus for innovation in pollution control.
- Studies on environmental regulation and industrial pollution control in developing countries rarely focus on the impact of environmental policy on technology responses of firms.
- Many developing countries lack the appropriate institutional context for developing and managing elaborate environmental policy instruments such as pollution taxes and tradable emission permits.

6.0 TUTOR-MARKED ASSIGNMENT

Identify and discuss any five influences of environmental politics on human activities.

7.0 REFERENCES / FURTHER READINGS

Aden, J., A. Kyu-hong and M. T. Rock (1999) "What is Driving the Pollution Abatement Expenditure Behaviour of Manufacturing Plants in Korea?" *World Development*, 27(7), pp. 1203 – 1214.

Adeoti, J. O. (2002) *Technology and the Environment in Sub-Saharan Africa: Emerging Trends in the Nigerian Manufacturing Industry*. England: Ashgate Publishing.

Ashford, N. (2000) "An Innovation-based Strategy for a Sustainable Environment", in Hemmelskamp, J.; Klaus, R. and Fabio L. (eds.) *Innovation-oriented Environmental Regulation: Theoretical Approaches and Empirical Analysis, New Economic Studies 10*. Heidelberg, Germany: Centre for European Economic Research.

Baumol, W. J. and Oates, W. E. (1988) *The Theory of Environmental Policy*. New York: Cambridge University Press.

DEAT (1996) "An Environmental Policy for South Africa", *Green Paper for public discussion*. Pretoria, South Africa: Department of Environmental Affairs and Tourism (DEAT).

Siebert, H. (1987) *Economics of the Environment: Theory and Policy*. Berlin, Germany: Springer Verlag.

UNDP (2001) "Making New Technologies Work for Human Development", *Human Development Report 2001*, New York: United Nations Development Programme.

MODULE 2 ENVIRONMENTAL PROBLEMS

UNIT 1 DEFORESTATION

CONTENTS

1.0 INTRODUCTION

Among the hazards that attend the life of every human being is a global danger arising from the pressure that human activities are exerting on the environment. This has put the environment to be on the edge, and may continue to be. One of such ways in which man is causing serious problem to the environment is deforestation.

Deforestation implies the long-term or permanent loss of forest cover and its transformation into another land use. It also refers to the long-term reduction of the tree canopy cover below a 10 percent threshold. Over 16 million hectares of forest is destroyed each year around the globe causing one of the largest and most rapid extinction events ever on the planet. In tropical areas of the world the forests harbour more than 50% of terrestrial biodiversity and remove over 1.3 gigatons of carbon per year from the atmosphere. These forests are important for the survival of man. Although, there are large companies that are converting forests to plantations especially palm oil, yet there are oil as well as mining companies polluting and destroying oil rich areas.

A large percentage, and perhaps the majority, of tropical deforestation are occurring because small holder farmers are slashing and burning it in order to open it up to agriculture. The immediate cause is that the soil lacks available nutrients, which are quickly removed when ground cover, or the forest,

is removed. The deeper cause is under-development of communities. These communities are very poor, often have little access to health care, education or even markets to sell produce. They have been forgotten by their governments and left to eke out a living on marginal land. The consequences are that the world is losing enormous natural wealth that has both human utility e.g. in the form of cures for diseases, and inherent value. To make matters worse much of this wealth is being converted to CO_2 which in turn is warming up our planet. Indeed 20% of all global CO_2 emissions are due to the burning of tropical forests.

The solution is to help these rural communities with alternatives to slash and burn. The immediate solution lies in sustainable agriculture where soil can be made more fertile without adding man-made chemicals such as organic fertilizers, terracing, using trees as buffers, rotating crops and many more systems that are not currently being utilized. The long term solution lies in the development of these communities through access to health, education and opportunities for work.

2.0 OBJECTIVES

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

- define and describe the various types of forests;
- explain the importance of forests;
- define and explain the meaning of deforestation; and
- describe the consequences of deforestation.

3.0 MAIN CONTENT

3.1 Types of Forests

There are five main classes of forests:

- **Primary forest**: is a forest that has never been logged and has developed following natural disturbances and under natural processes, regardless of its age.
- **Secondary forests**: are forests regenerating largely through natural processes after significant human or natural disturbance, and which differ from primary forests in forest composition and/or canopy structure.
- **Disturbed forests**: Any forest type that has in its interior significant areas of disturbance including clearing, felling for wood extraction, anthropogenic fires, road construction, etc.
- **Frontier forests**: large, ecologically intact, and relatively undisturbed forests that support the natural range of species and forest functions.
- **Forest plantation** is one established by planting or/and seeding in the process of afforestation or reforestation. It consists of introduced species or, in some cases, indigenous species.

3.2 Importance of Forests

Forests provide a number of uses as enumerated below.

i. Forest Products

- Wood is gather wood for cooking.
- Forests provide useful wood products. Round-wood (whole logs) can be processed into building materials, or made into plywood products, furniture, etc. Pulp is used for paper, boxes, and a wide variety of other products.
- Forests are the source of numerous non-wood products, including bark, dyes, fibres, gums, incense, latexes, oils, resins, shellac, tanning compounds and waxes.
- Fruits, nuts and berries are harvested as food.

ii. Ecosystem Services

- Forests influence climate. Forests transport great quantities of water to the atmosphere via plant transpiration. Much of that transpired water replenishes the clouds and rain that maintains the forests. If the forest is cut, much more of that rain will become river water,

flow to distant seas, and the region will become drier. In this way, forests maintain local climate and strongly influence global fluxes of oxygen and carbon dioxide.

- **Forests protect the top soil and husband important nutrients.** The annual flood crest of the Amazon River has increased over recent years without any concomitant increase in rainfall, presumably due to deforestation. Damaging floods are one frequent consequence of deforestation.
- **Forests harbour tremendous biological diversity.** Forests have the potential to provide us with new crop varieties and medicines. However, since less than 1% of tropical plants have been screened for possible use to medical science, ongoing deforestation results in the permanent loss to science of other species before their value can be recognized.

3.3 Causes of Deforestation

There are many causes of deforestation:

- **Agriculture:** The overwhelming direct cause of deforestation is agriculture. Subsistence and commercial agriculture are responsible for deforestation.
- **Corruption of government institutions:** in some countries, powerful families allied with government rulers control large and highly valuable timber concessions. These forests are being rapidly liquidated, at enormous profit.
- **Inequitable distribution of wealth and power:** degradation of forests has been traced to economic incentives that make forest conversion appear more profitable than forest conservation. In many areas, poor people have few options to make income, and forests have few protectors, and so land is cleared for agriculture and valuable timber is sold for profit.
- **Population Growth and overpopulation:** the role of population dynamics in a local setting may vary from decisive to negligible, thus deforestation can result from a combination of population pressure and stagnating economic, social and technological conditions.
- **Urbanization:** this is often viewed as a root cause of deforestation; there are cases in which the impacts of urbanization through the development of roads and the use of mechanized equipment.
- **Logging and fuel wood removals:** some scholars do not agree on whether industrial logging is an important contributor to global deforestation. However, it is clear that poor people clear forest because they have no alternative means of livelihood.
- **Government-sponsored development projects:** by the 1990s the majority of deforestation was caused by industrial factors, including extractive industries, large-scale cattle ranching, and extensive agriculture.
- **Accessibility:** access to markets, requiring roads and capital, is an additional powerful force, recently expanded due to the suite of changes referred to as globalization.

Impacts of Deforestation

i. Environmental Impacts:

- Deforestation is ongoing and is shaping climate by contributing to global warming.
- Deforestation is responsible for approximately 20% of world greenhouse gas emissions.
- Deforestation may cause carbon stores held in soil to be released.
- deforestation and forest degradation result in the reduction of greenhouse gas (GHG).
- incineration and burning of forest plants to clear land releases large amounts of CO_2, which contributes to global warming.
- Forests are also able to extract carbon dioxide and pollutants from the air, thus contributing to biosphere stability.

ii. Hydrological Impacts

- The water cycle is affected by deforestation in the following ways.
- When part of a forest is removed, the trees no longer evaporate away this water, resulting in a much drier climate.
- Reduction in the content of water in the soil and groundwater as well as atmospheric moisture
- Deforestation reduces soil cohesion, so that erosion, flooding and landslides ensue.
- Forests enhance the recharge of aquifers in some locales; however, forests are a major source of aquifer depletion on most locales.
- Shrinking forest cover lessens the landscape's capacity to intercept, retain and transpire precipitation.
- Deforested areas become sources of surface water runoff, which moves much faster than subsurface flows.

iii. Impacts on Soil

- Deforestation generally reduces the protection of the soil from tree litter.
- Shrubs and trees have been encroaching on grassland. The trees themselves enhance the loss of grass between tree canopies thereby rendering the bare inter-canopy areas to become highly erodible.
- Tree roots bind soil together, and if the soil is sufficiently shallow, they act to keep the soil in place by also binding with underlying bedrock.
- Tree removal on steep slopes with shallow soil thus increases the risk of landslides, which can threaten people living nearby. However most deforestation only affects the trunks of trees, allowing the roots to stay rooted, negating the landslide.

iv. Ecological Impacts

- The removal or destruction of areas of forest cover has resulted in a degraded environment with reduced biodiversity.
- With forest biotopes being irreplaceable source of new drugs (such as taxol)
- Deforestation can destroy genetic variations (such as crop resistance) irretrievably.
- Removal or destruction of significant areas of forest cover has resulted in a degraded environment with reduced biodiversity.
- Tropical rainforest deforestation is contributing to the ongoing Holocene mass extinction.
- With an underlying assumption that as the forest declines, species diversity will decline similarly.

v. Economic Impacts

- Historically utilization of forest products, including timber and fuel wood, have played a key role in human societies, comparable to the roles of water and cultivable land. Today, developed countries continue to utilize timber for building houses, and wood pulp for paper. In developing countries, almost three billion people rely on wood for heating and cooking. Thus, damage to forests and other aspects of nature could halve living standards for the world's poor and reduce global GDP by about 7% by 2050.
- The forest products industry is a large part of the economy in both developed and developing countries. Short-term economic gains made by conversion of forest to agriculture, or over-exploitation of wood products, typically leads to loss of long-term income and long term biological productivity (hence reduction in nature's services). West Africa, Madagascar, Southeast Asia and many other regions have experienced lower revenue because of declining timber harvests. Illegal logging causes losses to national economies annually.
- The new procedures to get amounts of wood are causing more harm to the economy and overpower the amount of money spent by people employed in logging.

4.0 Conclusion

It is impossible to overstate the importance of humankind's clearing of the forests. The transformation of forested lands by human actions represents one of the great forces in global environmental change and one of the great drivers of biodiversity loss. The impact of people has been and continues to be profound. Forests are cleared, degraded and fragmented by timber harvest, conversion to agriculture, road-building, human-caused fire, and in myriad other ways. The effort to use and subdue the forest has been a constant theme in the transformation of the earth, in many societies, in many lands, and at most times. Deforestation has important implications for life on this planet.

5.0 Summary

- Forest ecosystems provide valuable human products and ecosystem services
- Deforestation has already removed about half of the world's forests, and in your lifetime threatens to eliminate most of the remaining tropical forests. Many temperate forests are re-growing, however
- Forests are managed for multiple uses, to restore as much of possible of natural ecosystem function, and in some cases to attempt to restore "old-growth" or pre-disturbance conditions

6.0 Tutor-Marked Assignment

Discuss the environmental impacts of deforestation.

7.0 References/Further Reading

Abramovitz, J. N. (1998) "Sustaining the World's Forests", *State of the World*. Norton, Worldwatch.

Gurney, R. J, Foster, J. L. and Parkinson, C. L. (1993) *Atlas of Satellite Observations related to Global Change,* Cambridge Press.

Hart, S. L. and Ahuja, G. (1996) "Does it Pay to Be Green? An Empirical Examination of the Relationship Between Emission Reduction and Firm Performance", *Business Strategy and the Environment,* Vol. 5, pp. 30–37.

Lillesand, T. M. and Ralph W. K. (1994) *Remote Sensing and Image Interpretation,* Wiley Press.

Schelhas, J. and Russell, G. eds. (1996) *Forest Patches in Tropical Landscapes,* Island Press.

UNIT 2 POLLUTION

CONTENTS

1.0 INTRODUCTION

The dynamic industrialization and rapid development of agriculture in Nigeria are being accompanied by an increase in the quantity and varieties of pollutants released into air, water, and soil. These pollutants are a threat to the ecosystem as a whole as well as ultimately threaten the very survival of the people. The situation is most critical at present in the oil producing areas, particularly in the Niger Delta of Nigeria.

Nigeria's environmental pollution stems from not only charcoal fires, but also mining, vehicle emissions, industrial factories, improper waste disposal system and underground coal fires. Underground fires are also hazardous for their capacity to cause land to cave in when the coal turns to soft ash below the surface. However, not all of Nigeria's environmental health related problems stem from human - generated pollution or degradation. Indeed, oil spillage is one of the major sources of air, land and sea pollution in Nigeria, particularly in the Delta regions.

2.0 OBJECTIVES

At the end of the unit, learners should be able to

- define and explain pollution; and
- mention and discuss the various types of environmental pollution.

3.0 Main Content

3.1 Land Pollution

There is nothing in the whole of nature, which is more important than or deserves as much attention as the land. Truly, it is the land that makes the world a friendly environment for humanity. The land nourishes and provides for the whole of nature. In some parts of the world, the topsoil is suffering from dangerously low organic matter levels and could not be expected to sustain the farming systems, which have been imposed upon them.

Land pollution is the degradation of the Earth's land surface through misuse of the soil by poor agricultural practices, mineral exploitation, industrial waste dumping, and indiscriminate disposal of urban wastes. It includes visible waste and litter as well as pollution of the soil itself. Like home air pollution, land pollution is also a common problem worldwide. Land pollution is the direct result of the activities that humans engage in. Land pollution is about contaminating the land surface of the earth through dumping urban waste matter indiscriminately, dumping of industrial waste, mineral exploitation, and misusing the soil by harmful agricultural practices. Land pollution includes visible litter and waste along with the soil itself being polluted. The soil is polluted by the chemicals in pesticides and herbicides used for agricultural purposes along with waste matter being littered in urban areas such as roads, parks, and streets.

3.1.1 Causes of Land Pollution

The main causes of land pollution include.

- Increase in urbanization is one of the major causes of land pollution. Construction uses up forestland, which leads to the exploitation and destruction of forests. Increase in demand for water has resulted into the construction of more reservoirs thereby resulting in the loss of land.
- The disposal of non-biodegradable wastes, including containers, bottles and cans made of plastic, used cars and electronic goods, leads to the pollution of land.
- Agricultural wastes including the waste matters produced by crop, animal manure and residues of the farmland are one of the major causes of land pollution. The pesticides and fertilizers used by farmers to increase the crop yield, leaches into the nearby land areas and pollutes them.
- Herbicides, pesticides, and insecticides are more poisonous to the land than what they are designed to kill or deflect.
- Mining leads to the formation of piles of coal and slag. When these wastes are not disposed through proper channel, they are accumulated and contaminate the land.
- Industrial wastes are major contributors of land pollution. Dumping of toxic materials such as chemicals and paints makes the areas surrounding the industries, look very filthy.
- Improper treatment of sewage leads to the accumulation of solids, such as biomass sludge.
- Burning of solid fuels leads to the formation of ashes, which is yet another cause of land pollution.
- Untreated domestic and industrial wastes lead to land pollution.
- Garbage dumped by people makes the streets unhealthy, unfit and dirty to reside in.
- Burial is a very common methodology of surrendering the dead; digging process leads to erosion especially within cemeteries. As bodies decompose, there is a release of gases and fluids that are harmful to the ground, causing serious pollution problems for the surrounding land.

3.1.2 Effects of Land Pollution

- Improper methods for the disposal of wastes make the places to look dirty thereby causing series of health hazards.
- Breathing in polluted dust or particle can result in a number of health problems related to the respiratory system.
- Improper disposal of household wastes leads to allergic reactions on the skin.
- Pregnant women living in unhealthy and dirty environment can incur breathing problems and a number of diseases, which may affect the health of the baby as well.
- Land pollution has serious effect on wildlife. Flora, which provides food and shelter to wildlife, are destroyed.

3.2 Water Pollution

Water pollution is the introduction into fresh or ocean waters of chemical, physical, or biological material that degrades the quality of the water and affects the organisms living in it. This process ranges from simple addition of dissolved or suspended solids to discharge of the most insidious and persistent toxic pollutants (such as pesticides, heavy metals, and non-degradable, bio-accumulative, chemical compounds).

3.2.1 Sources of Water Pollution

- **Industrial affluent:** Water is discharged from after having been used in production processes. This waste water may contain acids, alkalis, salts, poisons, oils and in some cases harmful bacteria.
- **Mining:** Mines, especially gold and coal mines are responsible for large quantities of acid water.
- **Oil Spillage:** Leakage of oil into a body of water, like river or stream, has very unpleasant ramifications. The surface of the water becomes coated with very thick layers of crude oil, preventing oxygen from getting to the fish or other marine life in the water.
- **Agricultural Wastes:** Agricultural pesticides, fertilisers and herbicides may wash into rivers and stagnant water bodies.
- **Sewage Disposal and Domestic Wastes:** Sewage as well as domestic and farm wastes are often disposed into streams, rivers and dams thereby polluting the water bodies.

3.2.2 Effects of Water Pollution

- destruction of both the surface and ground waters
- harmful to human health.
- rendering water useless for domestic and industrial uses
- pollution of water resources
- causal of health hazard to plants, animals and people

3.3 Air Pollution

Air pollution is the accumulation in the atmosphere of substances that, in sufficient concentrations, endanger human health or produce other measured effects on living matter and other materials. Among the major sources of pollution are power and heat generation, the burning of solid wastes, industrial processes, and, especially, transportation. The major types of pollutants are carbon monoxide, hydrocarbons, nitrogen oxides, particulates, sulphur dioxide, and photochemical oxidants.

3.3.1 Sources of Air Pollution

Air pollution can result from various sources, such as:

- **Noise Pollution:** Noise pollution or unwanted sounds that are carried by the air, have an irritating and detrimental effect on humans and other animals.

- **Tobacco Smoke:** Tobacco smoke is one of the major forms of pollution in buildings. It is not only the smoker who is infected, but everyone who inhales the polluted air.
- **Exhaust Gases of Vehicles:** Pollution from exhaust gases of vehicles is responsible for the greatest percentage of air pollution in cities.
- **Combustion of Coal:** The combustion of coal without special precautions can have serious consequences. If winds do not blow away the poisonous gases, they can have fatal effects and may lead to death.
- **Acid rain:** Acid rain is the term for pollution caused when sulphur and nitrogen dioxides combine with atmospheric moisture to produce highly acidic rain, snow, hail, or fog.

3.3.2 Types of Air Pollution

There are many ways of classifying air pollution: there are the natural pollutants as well as man-made particulate matters and gaseous ones. Particulate pollutants could be solid or aqueous in form. Smallest particles (aerosols) can remain suspended and they are capable of penetrating all sites of the respiratory tract. Others in this regard may result from Volcanic ash, radioactivity, pollen dust and smoke from fires. Also, particulate matters can be solid particles from grinding or crushing or, even, in form of fumes such as solid particles occurring when vapours condensed e.g. mist and fog. Other

forms are carbonaceous dust, metallic oxides, salts, and acids. Gaseous pollutants are derived from combustion processes, hydrocarbons, oxides of sulphur and nitrogen compounds.

Also, air pollutants can be classified as criteria and hazardous. Criteria pollutants are emitted from many large diverse sources, including mobile and stationary sources. Air is omnipresent and, therefore, poses the greatest overall threat to human health.

Hazardous Air Pollutants (HAPs) have limited sources, most especially, from specific industrial establishments. They are more toxic and even carcinogenic. Examples of hazardous air pollutant include formaldehyde, cadmium, and vinyl chloride. Heavy metals (such as chromium, mercury) and organics (benzene, perchloroethylene) are members of the HAPs family.

Many air pollutants known to be hazardous to health are emitted indoors. Indoor environments trap pollutants, and levels may be 2 to 5 times higher than outside. Air inside a building can be polluted as a result of biogenic pollutants such as Aeropathogens and Aeroallergens; infiltration from outdoors especially from moulds and fungi, combustion sources, animal dander, and outdoor air pollution. Sources of indoor pollution may also be as a result of reactivity of pollutants and poor housing conditions such as vermin and pests. Building occupancy, human activities inside the structure, gas-off from synthetic building materials and reliance on forced air ventilation systems are other sources of indoor air pollution.

3.3.3 Effects of Air Pollution

Air pollution influences human health in various ways based on such factors as season, age, gender, and health status. However, young children and elderly people suffer more from the effects of air pollution. Major effects of air pollution include:

- irritation to the eyes, nose and throat
- upper respiratory infections such as bronchitis and pneumonia
- aggravation of such medical conditions as asthma and emphysema.
- chronic respiratory diseases such as lung cancer, heart disease
- air pollution could aggravate the effects of sulphur dioxide thereby reducing visibility and increasing corrosion owing to reduction in the amount and intensity of sunlight
- acid rain is another consequence of air pollution. When a pollutant such as sulphuric acid combines with droplets of water in the air, the water or snow becomes acidified. The acid eats into the stone, brick and metal articles and pollutes water sources. Coal in South Africa is rich in sulphur and the power stations in the Mpumalanga Province could be responsible for acid rain over other areas of our country.

4.0 Conclusion

People across the world have been facing a number of health problems caused due to the pollution of land, water and air. The environment is now suffering from terrible pollutions of various sorts. Disposal of urban and industrial wastes, exploitation of minerals, and improper use of environment by inadequate agricultural practices are just few factors. Urbanization and industrialization are major causes of environmental pollution. The Industrial Revolution set a series of events into motion which destroyed natural habitats and polluted the environment, causing diseases in both humans and other species of animals. Land pollution, in particular, has some of the most devastating effects on both nature and living beings. It is characterized by the contamination of earth's surface, where humans and other creatures live.

Without a well balanced ecosystem, more animals die from overpopulation to under population. Aside from the moral issues associated with pollution, the survival of the ecosystem is vital to human survival; man depends on the ecosystem to provide more than merely the air, but also to provide a wealth and richness that we thrive upon. However, the senseless suffering of the creatures that are killed through human actions could be the final death of a specie or the last of its kind. Thus, care is

needed to maintain the environment in good quality in order to prevent or minimize the harmful impacts of pollution

5.0 Summary

In this unit, we have learnt that

- pollution is the degradation and contamination of the environment human activities such as poor agricultural practices, mineral exploitation, industrial waste dumping, and indiscriminate disposal of urban wastes;
- pollution often disrupts the balance of nature, causing human fatalities;
- the environment is polluted in three main ways: land, water and air;
- air and land pollution are common problems worldwide ;
- land pollution is the direct result of the activities that humans engage in which results in serious health hazards and degradation of the environmental quality.

6.0 Tutor-Marked Assignment

Discuss the main sources of pollution in the Nigerian urban areas.

7.0 References / Further Readings

FEPA (1991) *National Effluent Limitation Regulation*, Lagos, Nigeria: Fed. Government Press.

Hettige, H; Mainul, H; Sheoli, P and David W (1996) "Determinants of Pollution Abatement in Developing Countries: Evidence from South and Southeast Asia", *World Development*, Vol.24(12), pp. 1891–1904.

Howes, R., J. and Whelan, B. (1997) Clean and Competitive? Motivating Environmental Performance in Industry, London, England: Earthscan Publications.

Lubeck, P. M. (1992) "Restructuring Nigeria's Urban-Industrial Sector within the West African Region: The Interplay of Crisis, Linkages and Popular Resistance", *International Journal of Urban and Regional Research*, Vol. 16(1), pp. 6–23.

Milliman, S. and Prince, R. (1989) "Firm Incentive to Promote Technological Change in Pollution Control", *Journal of Environmental Economics and Management*, Vol. 17, pp. 247–265.

UNIT 3 WASTES DISPOSAL SYSTEMS

CONTENTS

1.0 INTRODUCTION

One of the most critical issues in our environment today is poor sanitary conditions. This issue has not only become a recurring issue in the media, it has also attracted scholars and researchers in their studies. Urban decay connected with over-crowding is almost entirely a large town problem. Wastes

disposal constitutes to be nuisance and a source of embarrassment to many nations particularly visitors to the country who assess the state of health environment from this angle. All these problems, as manifested in urban sprawl, poor access to dwellings, bad drainage, housing congestion, uncontrolled and increasing density of physical development among many other problems, characterize the high-density areas of Nigerian cities.

Waste is an unwanted or undesired material or substance. It is also referred to as rubbish, trash, garbage, or junk depending upon the type of material and the regional terminology. Waste is regarded as unwanted material that is no longer needed and is thrown away. Thus, waste disposal is a process of getting rid of unwanted materials. Materials such as food wastes, paper, plastic, metal containers, leaves, glass, leather, rubber, textile, wood and bulky items e.g. boxes, refrigerators etc. added to the growing mountain if waste are scrap of tyres. Once a substance or object has become waste, it will remain waste unless it is fully recovered and does not poses any threat to the environment or human health.

3.0 Main Content

3.1 Classification of Wastes

Generally, waste exists in three main states - solid, liquid and gas. Gaseous type of waste is rarely found in homes, it is usually peculiar to large-scale industries, while liquid and solid waste are part of common domestic waste. Of course, industrial waste could also be in solid or liquid form. It has been observed that the nature of wastes generated in urban areas is usually different from that of rural areas. Perhaps socio-economic factors should be held responsible for the variance. In the rural areas, organic materials such as leaves/vegetables/plant materials, kitchen waste, etc constitute larger percentage of their disposed waste. While urban waste is usually characterized with a balance of organic and inorganic waste; depending on the disposable income, taste, habit, status, educational level, and other relevant factors of the average individual in the areas concerned. Organic waste does not take much time to get decomposed and this includes leaves, vegetables, leftover food, kitchen waste and the like. On the other hand, inorganic waste usually take longer period to get decomposed, some take several years, while others do not decomposed until they are retrieved and recycled mechanically or with the aid of chemicals and this includes used tyres, plastic, heavy metals, vehicle/machine scraps, computer scraps, etc.

3.2 Waste Disposal Systems

Wastes, of various kinds, are disposed of in a number of ways; however the common ones are: dumping, land filling of waste and incineration.

- Open site dumping is very common in urban areas where the law enforcement agents are too relaxed in the execution of waste and environmental related laws. This type of waste disposal method does not require any special design and so does not have any particular design characteristics.
- Landfill is a method of waste disposal that is common in urban areas of most countries. Landfills are often established in disused quarries, mining, and void or borrow pits. A properly designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials. Design characteristics of a modern landfill include methods to contain leachate such as clay or plastic lining material. Deposited waste is normally compacted to increase its density and stability, and covered to prevent attracting vermin (such as mice or rats).
- Incineration is a controversial method of waste disposal, due to issues such as emission of gaseous pollutants. It involves combustion of waste material. Incinerators convert waste materials into heat, gas, steam, and ash. Incineration is carried out both on a small scale by individuals and on a large scale by industry and government. It is recognized as a practical

method of disposing of solid, liquid and gaseous waste, particularly the hazardous waste materials (such as biological medical waste). Incineration is common in countries such as Japan where land is relatively scarce, as these facilities generally do not require as much area as landfills.

3.3 Effects of Poor Waste Disposal Systems

Indiscriminate dumping of wastes on the slopes of streams and river courses and other unapproved sites can cause serious problems to the environment. Major consequences of poor waste disposal systems include:

- flooding
- destruction of lives and properties.
- spoiling of scenic resources
- pollution of soil and water resources
- causal of health hazard to plants, animals and people

In sum, careless dumping of waste usually results pollution of water, outbreak of epidemics, poor sanitary conditions of urban areas and other notable problems such as shortage of fish resources, siltation and drying of streams, blocking roads, alleys and pavements. The Ogunpa flood disasters in Ibadan in the early 1980s are still fresh in the memories of those who were affected in one way or the other.

4.0 CONCLUSION

The challenge of waste disposal system is neither a new thing nor peculiar to the developing nations alone but rather, a global issue. For every consumption attempt, waste generation is inevitable. This is evident in every production process, and one cannot shy away from the fact that waste is being generated at the end of it all. Since consumption is the essence of production and human lives are sustained by consumption of goods and services, and then waste generation becomes necessary, however, it can be minimized if an appropriate waste management system is adopted in spite of the increasing urban population.

Waste disposal is a consequent of the industrialisation process in both developed and developing countries. Whereas the developed countries have put in place policy measures to contain the waste problems, developing countries are still battling with the mountains of waste generated daily. In many parts of the world, people are facing a serious waste disposal problem. The problem results because too much waste is produced and there is too little acceptable space for permanent disposal.

5.0 SUMMARY

In this unit, we have learnt that:

- waste is an unwanted or undesired material or substance;
- waste exists in three main states - solid, liquid and gas;
- hazardous waste materials are disposed off by literal dumping;

6.0 TUTOR-MARKED ASSIGNMENT

With specific examples from Nigeria, discuss the evils of any one environmental problem.

7.0 REFERENCES / FURTHER READINGS

Balogun, O. (2001): *The Federal Capital Territory of Nigeria: A Geography of ItsDevelopment.* University Press Publishing House, University.

Bisong, E. F. and Ajake (2001). "Solid waste management for sustainable rural development", in Bisong, E. F. (ed.): *Natural Resources use and conservation for sustainable Rural Development*. Lagos: BAAS International Company.

Muller & Schienberg (1997) 'Gender and Urban Waste Management'. Paper presented at the *Gender, Technology and Development Conference,* organized by Tool Consult, Amsterdam.

UNIT 4 HUMAN HEALTH

CONTENTS

1.0 INTRODUCTION

Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, biological, social, and psychosocial factors in the environment. It also refers to the theory and practice of assessing, correcting, controlling, and preventing those factors in the environment that can potentially affect adversely the health of present and future generations.

The growing negative impacts of environmental pollution, desertification, and overall ecological damage can turn the society into unhealthy environment. There are many other factors besides pollution that may be contributing to poor health and high mortality rates. Among these are poverty, climate conditions, and access to health care. World Health Organisation stressed the importance of access to health care services when assessing the overall health risks in highly polluted regions. Moreover, there are regional variations, specifically between rural and urban areas, that play a key role in determining the health risks due to pollution. Health risks from the environment disproportionately affect country's poor rural regions. The quality and availability of health care in Nigeria's rural areas generally lags behind urban areas.

Air pollution causes serious health problems, including lung cancer, asthma, cardiovascular disease, and premature death. Changes in the atmospheric conditions can take the harshest toll on human health, particularly during harmattan (in the Tropics) or winter (in the temperate lands) when coal burning is at its height. Burning coal releases nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and Particulate Matter (PM) - all of which are dangerous in high doses. Sulphur dioxide not only damages crop and other flora, but can impair breathing and aggravate existing heart disease. Particulate matter is known to cause respiratory diseases, as the fine particles permeate deeply into

the lungs. Although mercury from burning coal is a serious problem in some areas, it has the lowest mercury levels in the country and therefore has not been associated with mercury-related health problems. Indoor air pollution is also a significant problem especially in rural areas, with disproportionate effects on women and children.

2.0 OBJECTIVES

At the end of this unit, learners should be able to

- describe the influences of industrial activities on human health;
- explain the risks of children in the contaminated environment;

3.0 MAIN CONTENT

3.1 CHEMICAL HYSTERIA AND THE ENVIRONMENT

Chemicals are one of the wonders of human creation. They help heal and feed us; they help fuel our autos and heat our homes; they help produce toys and computers. Yet some chemicals can hurt, making them a perfect target for alarmists who detest most anything modern. There's no doubt that chemicals have become an integral part of our lives. The Centres for Disease Control (CDC) has released its latest "National Report on Human Exposure to Environmental Chemicals," which reviewed Americans' exposure to 116 different substances. The report confirms that most people have contact with a plethora of chemicals. Yet this conclusion reflects the dramatic advances in bio-monitoring of scientists being now capable of detecting the minutest trace of different substances in human beings. Researchers measure concentrations of a thousandth, millionth, and billionth parts. This enables us to better understand our environment, assess chemical exposure, and understand risks. But it also provides a tool for alarmists, who conveniently ignore actual contact levels when claiming an epidemic of chemical exposure.

At a time when many people fear for their lives, the CDC found much good news. Exposure to lead, which is particularly harmful to the development of children, and nicotine, a tobacco residue, is down. Moreover, exposure levels to some of the most toxic chemicals were extraordinarily low. Even the bad news was bad mainly relative to overall successes.

The Environmental Working Group (EWG) conducted its own study and found an average of "91 industrial compounds, pollutants, and other chemicals" in the nine Volunteers studied. All told, the EWG reported 167 different chemicals, many of which, it claimed, caused cancer, birth defects, or other harms. The result was a significant "body burden," as the group put it. But this is fear-mongering at its misleading worst.

3.2 INFLUENCES OF ENVIRONMENTAL POLLUTION ON HUMAN HEALTH

People naturally worry about the impact on youthful development. In fact, there is little toxicological evidence to support the premise that children are consistently more susceptible to environmental chemicals than adults. Where there is a problem, kids need to be protected. But parents need not live in fear of a world that is actually getting safer and healthier day by day. It is important to be conscious of the disturbing pattern in which activists with a non-science agenda manipulate the public's legitimate and appropriate concern for children's health. In most cases, this is under the guise of an effort to promote legislation, litigation, and regulation.

This is the fundamental problem. Alarmist groups with radical political agendas are ever-ready to manipulate science to promote their own ends. A particularly apt example is the case of acrylamide, a chemical coagulant used in drinking water, wastewater treatment, and tunnel construction. In April 2002 the Swedish National Food Administration and researchers at Stockholm University held a

press conference announcing that disturbingly high levels of acrylamide had been found in food. The revelation set off a media sensation around the world. Acrylamide is formed naturally in the cooking of many foods. It appears to cause cancer in rodents fed exceptionally high doses. In fact, in this case the doses not only well-exceeded human consumption, but they also may have exceeded medically tolerable levels for mice, since more died from other causes than from cancer.

Moreover, extrapolating such results to humans is always problematic: genetic differences between rodents and primates often result in different metabolic reactions to chemicals. In January 2007, the *British Journal of Cancer* published a study announcing that there was no apparent link between acrylamide in food and cancer. One British newspaper headline trumpeted: "Crisps Do Not Cause Cancer!" Obviously, some substances do cause cancer, and evidence of carcinogenic properties requires investigation.

3.3 ENVIRONMENTAL HEALTH AND PROTECTION SYSTEM

Environmental health and protection is a basic component of the field of public health regardless of the titles of agencies involved. There are widely varying definitions of public health. Public health is the art and science of preventing disease and disability, prolonging life, promoting the efficiency and health of populations, and insuring a healthful environment through organized community effort. It is important to understand that health care is not public health and public health is not health care. Health care is the diagnosis, treatment and/or rehabilitation of a patient under care is practiced on a one-on-one basis. Environmental health and protection is the art and science of protecting against environmental factors that may adversely impact human health or the ecological balances essential to long term human health and environmental quality. Such factors include, but are not limited to, air, food and water contaminants (such as radiation, toxic chemicals, wastes, disease vectors, safety hazards, and habitat alterations).

Public health services delivery systems have evolved from travelling on a single track to travelling on multiple tracks, these being personal public health and environmental health and protection. Reasons include:

- perception that Health Departments in Nigeria are not effective agencies;
- public and political demand for greater environmental health and protection;
- increasing societal importance of environmental health and protection;
- unfortunate oozing of health department emphasis toward health care and away from public health, including environmental health;
- effectiveness of environmental advocacy groups;
- health department failure to emphasize regulatory methods;
- health department discomfort in addressing ecological issues; and
- the increasing complexity of environmental issues.

At the state levels, environmental health and protection expenditures and numbers of personnel account for approximately half of the entire field of public health. Environmental health and protection is the largest single component of the field of public health. Some 90 to 95% of state level environmental health and protection activities are now assigned to agencies other than state health departments, and there appears to be a similar trend at the local level.

Early day environmental health and protection practice was geared to communicable disease problems. Now, it has also embraced the impacts of various types and combinations of now-living contaminants and other stresses. Such impacts are more subtle and long range in their effects. There is greater difficulty in measuring the effects as well as in isolating and understanding the cause. Few environmental health and protection agencies have epidemiology expertise, and many of them rely on epidemiological services from health departments. Every environmental health and protection agency should have in-house epidemiology expertise.

Considering the serious difference in opinions between scientists and political leaders, risk assessment should be understood and practiced by all interests involved in protecting the health of the public and the quality of the environment. We do not live in a risk free society or

environment. The pursuit of zero-risk is frequently unattainable and creates unfounded public concern when zero-risk is not attained.

High quality laboratory support is essential to environmental health and protection functions. Effective programs depend on the quality of the workforce. However, very few environmental health and protection practitioners have been adequately educated in basic environmental health sciences and in program methodologies. Schools of public health have gravitated toward health care and research, and away from educating environmental health and protection practitioners. Formal education was once considered to be a vaccine that would prevent ignorance and ineffectiveness later in one's career. However, such formal education is inadequate by itself, and does not provide all the knowledge and skills for effective careers. Continuing education, or "re-treading", should be relevant, and strongly supported by management.

Programs must have adequate data and surveillance systems in addition to epidemiology and risk assessment. GIS is an excellent example. Practitioners must be computer literate and have current technology. Surveillance systems are essential, but typically inadequate. Many environmental health and protection practitioners do not demonstrate risk communication skills. This is among the reasons environmental health and protection priorities and policies frequently differ from those recommended by scientists. In the absence of effective risk communication, sound risk assessment is merely an academic exercise. Many practitioners confuse public information with the art of risk communication. Risk communication is an art requiring openness throughout planning and decision processes. Failure to communicate risk and develop scientifically valid priorities and policies are linked to the failure to educate and involve the public, and openly discuss the data, assumptions, and alternatives on which risk has been assessed.

4.0 CONCLUSION

Human health is regarded as the public's business, and will not be understood or supported in the absence of comprehensive and continuing public information and educational activities practiced by all practitioners, not solely by a public information officer. Citizens and political leaders must be part of the solution and understand the importance of the environment to quality of life and economic well-being. Effective environmental health and protection depends on building and constantly travelling communication bridges connecting a wide variety of groups and agencies involved in the struggle for a quality environment and enhanced public health. These include land use, energy production, transportation, resource development, the medical community, public works, agriculture, conservation, engineering, architecture, education, product design and development interests, economic development, chambers of commerce, advocacy groups, trade and industry groups, the media and elected officials. And the bridges must be institutionalized rather than being left to chance and changing personalities. Environmental health and protection requires a community commitment.

5.0 SUMMARY

In this unit, we have learnt that:

- chemicals are one of the wonders of human creation and they have become integral part of our lives.
- exposure levels to some of the most toxic chemicals were extraordinarily low; yet today the exposure of black children remains disproportionately high.
- having an environmental chemical in ones blood or urine does not mean that the chemical causes disease.
- multiple chemical exposure can be harmful - chemicals are currently hurting one-third of the population.
- environmental health data in the developing countries are difficult to access.
- environmental health and protection is a basic component of the field of public health regardless of the titles of agencies involved.

- there is confusion with health care and the oozing of emphasis from public health to health care. Health care is not public health and public health is not health care.
- environmental health and protection requires a community commitment.
- personal public health and environmental health and protection systems are travelling on multiple tracks with inadequate systems support and coordination.

6.0 TUTOR-MARKED ASSIGNMENT

Give a reasoned assessment of the environmental issues in public health management in Nigeria.

7.0 REFERENCES / FURTHER READING

Dasgupta, N. (2000) "Environmental Enforcement and Small Industries in India: Reworking the Problem in Poverty Context", *World Development*, 28(5), pp. 945–967.

Downing, P. B. and White, L. J. (1986) "Innovation in Pollution Control", *Journal of Environmental Economics and Management*, Vol. 13, pp. 18–29.

Garrett L. (2002) *Betrayal of Trust: the Collapse of Global Public Health*. Oxford: Oxford University Press

Ingram, R. (2001) "Health in Xinjiang." *Central Asia Caucus Institute Analyst*. [Online]. http://www.cacianalyst.org/?q=node/451

Nielsen, N. O. (1999) "The meaning of health". *Ecosystem Health,* 5 (6), p.5.

UNEP (1993) "The Textile Industry and the Environment", *Technical Report No. 16: United Nations Environment Programme: Industry and Environment*, Paris.

Wang, W. et al (2004) "Regional Comprehensive Assessment on Environment-Health of China." *Journal of Geographic Sciences*, 14 (2), pp. 187-192.

World Health Organisation / United Nations Environmental Protection (2001) "Environment and People's Health" [Online]. http://www.wpro.who.int/NR/rdonlyres/FD5E0957- DC76-41F2-B207-21113406AE55/0/CHNEnvironmentalHealth.pdf

MODULE 3 MANAGEMENT AND CONSERVATION OF ENVIRONMENTAL RESOURCES

UNIT 1 ENVIRONMENTAL MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Environmental management, especially in the developing countries, is achieved not only through environmental legislation, i.e. laws, regulations and rules which are enforceable in a court of law, but also through administrative provisions such as administrative orders, technical standards etc. which are applied through various administrative mechanisms. This is especially true in relation to the implementation of international environmental conventions. Often, many years pass before provisions are established in laws for the implementation and application of the provisions of international agreements. It is equally true in the implementation, especially at its early stages, of environmental policy, such as the requirement of environmental impact assessment in respect of development projects and the procedures to be followed in respect of such assessments. From this perspective, environmental legislation is one of the chief tools for formulating environmental policy while also being one of the major instruments for implementing it.

2.0 OBJECTIVES

At the end of this unit, learners should be able to

- present a spectrum of viewpoints and approaches to environmental management; and
- describe the methods for managing the environmental resources.

3.0 MAIN CONTENT

3.1 SUSTAINABILITY OF ENVIRONMENTAL RESOURCES

Despite rapid improvements in material well-being, which are rapidly spreading across the world, the rates of economic growth which have supported these improvements since the 2nd World War have drawn attention to the demands we now place on our environmental resources. Questions have been raised about the long-term sustainability of this economic progress, whether there is a limit to material improvements, and whether our current systems of exchange can recognise any limits before we run up against the buffers. One of the first to make this point was the economist, Kenneth Boulding, who published an article in 1966 entitled "The coming spaceship earth". Boulding argued that for the past century people had regarded environmental resources as if they operated in an open system, which he characterised as a "cowboy" economy. In such a view, resources were regarded as virtually limitless, with the supply increasing to meet growing demand simply by pushing the frontier further forward.

Under this type of paradigm, success could be measured by the ability of nations to maximise their outputs of goods and services, with residuals being dumped out with the system. In reality, Boulding pointed out that the earth is a closed system as far as material inputs were concerned, with only energy flows being exchanged outside its confines. Under these circumstances, we should regard our planet much more like a spaceship, and face up to the fact that we operate within a closed system in which we could neither create nor destroy matter. Within this new paradigm, Boulding went on to argue that we could not ignore our residues. As we destroyed our highly structured material resources to create economic growth, so we increased the planet's entropy levels. The appropriate measure of success for Building under such circumstances was not the maximisation of material outputs. It should instead be the extent to which we could minimise the inputs we require to sustain high living standards.

For all these reasons, a principle is increasingly being adopted by policy makers in taking allocative decisions which involve environmental resources that are non-renewable or exhaustible. This principle was first adopted by German policy makers, where it is known as the “VORSORGEPRINZIP”. In English the term means "the precautionary principle". The precautionary principle is based on the idea of the carrying capacity of ecosystems, and the need to

err on the side of caution when determining the extent to which scarce environmental resources can be used for economic development.

Ecologists have observed that as we make greater demands on the natural environment, we reduce its resilience by lowering its complexity and diversity. In the process, we reduce the environment's ability to cope with the demands we place on it as we produce more material goods for our needs. Since it is normally impossible to establish beforehand what the threshold of any ecosystem is below which we reduce its viability and destroy it, the precautionary principle argues that we should always err on the side of caution in allocative decisions about the environment and environmental resources. Otherwise, there is no guarantee that our use of such resources will be sustainable.

3.2 NATURAL RESOURCES MANAGEMENT

The idea may be hard to accept, but the earth has never been in this situation before. In the words of the title of a recent book on environmental history, we confront something like "New Under the Sun". The business-as-usual way of dealing with the Earth System is not an option. It has to be replaced, as soon as possible, by deliberate strategies of good management that sustain the Earth's environment while meeting social and economic development objectives. Environmental Management is concerned with the use and conservation of natural resources, the protection of habitats and the control of hazards. Its field is applied ecology in the widest sense, without regard to the disciplinary boundaries created by modern academic study. Contributions are drawn from biology, botany, climatology, ecology, ecological economics, environmental engineering, fisheries, environmental law, management science, forest sciences, geography, geology, information science, law politics, public affairs and zoology.

It is vital to recognize that many environmental problems are common to a wide variety of nations, some are either global matters or at least oblivious of national boundaries. It is also vital that approaches, methods, and experience be shared among environmental practitioners in many countries, so that the problems of our ever more interdependent planet may be tackled in a concerted manner. Environmental Management treats mankind as steward of the natural environment: not all resources are to be preserved, but our responsibility to future generations, and to other living species, can only be fulfilled by conserving some resources and using others wisely and sparingly. The complexity of this task demands enlightened policy formulation. Man, as the principal user of the realm of nature, has a major responsibility to ensure that its impacts on the environment are benign rather than catastrophic. Environmental management facilitates this by disseminating the work of both academic researchers and professionals from outside the academic institutions, including those in business, government, research establishments, and public interest groups.

3.3 ENVIRONMENTAL LINKAGES IN THE NATURAL RESOURCE SECTOR

Although the term co-evolution is most frequently applied to species pairs, it can be argued that human societies and natural systems are coevolving. A basic definition of co-evolution is: the simultaneous development of adaptations in two or more populations, species, or other categories that interact so closely that each is a strong selective force on the other. Natural systems and human society certainly interact and shape each other. Natural systems have proven a strong selective force to human settlements through famine, disease, and natural disaster. Human society has proven a strong selective force to most ecosystems on earth – destroying a huge number of the earth's species and habitats. Human societies and natural systems shape each other, and benign changes enhance the survival of each partner. Co-evolution may be benign or hostile. The escalating pressures of pests might characterize hostile co-evolution and the pest-control measures in which the only species not eradicated are the least desirable ones to human society (i.e., cockroaches, fruit flies, and Norway rats).

Hostile co-evolution may also involve strong and unpleasant selective forces on human societies, such as famine following increasingly frequent disease or pest-related failures in mono-cultural agriculture or pollution-related disease from exhausting the waste purification capacity of remaining natural systems. A benign co-evolution would be one in which human cultural structures (e.g.,

economies, schools, and systems of belief) can sensitively respond to changes in ecosystem health. As a result, most of the earth's present species and habitats would survive, their ecological landscapes would be enlarged, and the landscapes, in turn, would continue to provide human society with ecosystem services such as water purification, carbon storage, waste processing, raw materials for genetic engineering and pharmaceuticals, etc. Ecological restoration is a benign act of human society toward natural systems and facilitates benign co-evolution. Ecological restoration is also an act of human self-interest because it increases the capacity of natural systems to provide ecosystem services.

An almost incredibly wide range is present in the relationships people believe exist between themselves and natural systems. In earlier times, direct and intimate interactions between hunters and gatherers and the natural systems affected these attitudes. Currently, however, direct interactions with natural systems are quite limited for many of the world's people – more and more people live in cities and very few wild systems are left. Society's interactions with the remaining, intensively managed ecosystems are qualitatively less intimate in the present global economy: local crop failure does not inevitably lead to famine and incremental changes in air quality tend to affect only a small group of people directly. That is, society does not directly experience a personal dependence on natural systems for essential goods and services as in the past, and attitudes about the relationship between humans and nature are more dependent on various culturally transmitted beliefs about the nature of the world: scientific, political, religious, or philosophical.

Even before the agricultural revolution, various human societies altered natural systems with fire, selective hunting of various species, and modest clearing of forests. During the agricultural revolution, land was cleared in ever-increasing amounts for the culture of specific crops valued by human society. The primary thrust of the agricultural revolution was to "tame" nature by clearing forests, draining swamps, and otherwise altering the landscape to enhance agricultural production. Additionally, when European settlers arrived in North America, they saw what appeared to be unlimited timber, soils of a considerable depth, and abundant game animals.

Based on human perceptions, wilderness and resources appear unlimited. Some pioneers thought nothing of shooting buffalo just to extract the tongue for consumption and leaving the rest to rot. Even so, most of society's wastes of the early agricultural systems were easily reincorporated into natural systems. Further, abandoned agricultural land quickly reverted to natural systems comprised predominantly of pioneering species which were ultimately replaced by other species if natural succession processes were permitted to occur. This rapid re-colonisation was possible because agricultural systems were fragmented rather than natural systems and sources of colonizing species always nearby. As the agricultural revolution proceeded, it was the natural systems that became more fragmented and, in some parts of the world, re-colonisation of the species inhabiting the area in the pre-agricultural era became increasingly scarce.

4.0 CONCLUSION

Surely, human societies would choose to minimize harsh environmental selective pressures such as famine and disease. If the form of co-evolution between natural systems and human society is to be guided toward a benign relationship, societies need to protect aggressively those ecosystem services that are essential to their own quality of life. Human society needs plants to capture sunlight and to provide food, building materials, and energy. Human society needs breathable air. Human society needs its waste products recycled. Human society needs potable water. Human society needs arable soils. These and other ecosystems services are essential to human quality of life and are provided by natural systems. Some ecosystem services are provided with no human intervention, while others are provided with minimal human effort compared to any human engineered alternatives. For example, in the United Sates the estimated cost of "supplying ecosystem services to seven people in Biosphere 2 was $9 million per person per year". The rest of human society depends on intact natural systems to provide these services. The ecological capital (forests, grasslands, wetlands, soils, biodiversity, etc.) must be preserved in order to continue to generate interest in the form of ecosystem services.

Two major factors presently governing human society's relationship with natural systems are:

- a net gain of nearly 100 million people annually in the earth's population; and
- the desire of almost all of these individuals to improve the quality of life primarily by converting habitats occupied by other species for human use and concomitantly converting natural resources into goods and services for human society.

This means that the land area that provides ecosystem services at the highest rates is declining at the same time that the number of humans sharing these services is increasing. The amount of ecosystem services per capita is plummeting.

5.0 SUMMARY

In this unit, we have learnt that:

- environmental management is concerned with the use and conservation of natural resources, the protection of habitats and the control of hazards;
- the complexity of environmental resources management demands enlightened policy formulation;
- as we destroy our highly structured material resources to create economic growth, so we increased the planet's entropy levels;
- the nature of changes now occurring simultaneously in the earth system, their magnitudes and rates of change are unprecedented;
- the accelerating human transformation of the earth's environment is not sustainable;
- abandoned agricultural land quickly reverted to natural systems comprised predominately of pioneering species which were ultimately replaced by other species if natural succession processes were permitted to occur;
- while previous generations could rely on natural systems to bounce back without human intervention, current generations cannot;
- human society needs breathable air, its waste products recycled, potable water, and arable soils as well as other ecosystems services provided by natural systems for human quality of life;
- some ecosystem services are provided without human intervention; and
- a net gain in population and the desire to improve life quality through conversion of habitats occupied by other species for human use and concomitantly converting natural resources into goods and services for human society are the two major factors presently governing human society's relationship with natural systems.

6.0 TUTOR-MARKED ASSIGNMENT

Identify and discuss five environmental linkages in the natural resource sector.

7.0 REFERENCES / FURTHER READING

Ayling, R.; and Kelly, K. (1997) "Dealing with conflict: natural resources and dispute resolution". *Commonwealth Forestry Review*, 76 (3), pp. 182–185.

Homer-Dixon, T. and Blitt, J. (1998) *Ecoviolence: Links among Environment, Population, and Security*. Lanham, USA: Rowman & Littlefield.

Kothari, A., Anuradha, R. V., and Pathak, N. (1998) "Community-based conservation: issues and prospects". In Kothari, A. Anuradha, R. V., Pathak, N., and Taneja, B. (eds.), *Communities and Conservation: Natural Resource Management in South and Central Asia*. New Delhi, India: Sage Publications.

UNIT 2 ENVIRONMENTAL CONSERVATION

CONTENTS

1.0 INTRODUCTION

The field of environmental conservation includes the study of environmental resources decline and its causes, and techniques to conserve rare and endangered species. Environmental conservation can be considered a part of conservation biology, a relatively young field that emphasizes the conservation of biodiversity and whole ecosystems, as opposed to the conservation of individual species. Within environmental conservation can be found many subfields, these include:

- Forest Conservation: Conservation studies and practices involving whole forests, as opposed to specific species.
- Wildlife Conservation: Conservation of animals and birds.
- Mineral Resources Conservation: Study and conservation of mineral resources.
- Invasive Species Study and Control: The study and control of species that have spread beyond their native area. Such species pose a significant threat for the conservation of native species.
- Crop Diversity Studies: Preservation of crop species, especially those of indigenous cultures.

Study and practice of the techniques involved in plant conservation including:

- ex situ conservation, the propagation of endangered species outside of their native habitat, with hope of reintroducing them;
- in situ conservation, the conservation of endangered species within their natural habitat as opposed to artificial conditions such as greenhouses or zoos; and
- reintroductions/habitat restoration, the study and practice of restoring an endangered species to its native lands.

2.0 OBJECTIVES

At the end of this unit, learners should be able to

- name and explain some conservation techniques for forests;
- identify how wildlife is conserved; and
- describe the systems of mining mineral resources.

3.0 MAIN CONTENT

3.1 THE NEED FOR ENVIRONMENTAL CONSERVATION

Despite rapid improvements in material well-being, which are rapidly spreading across the world, the rates of economic growth which have supported these improvements since the 2nd World War have drawn attention to the demands we now place on our environmental resources. Questions have been

raised about the long term sustainability of this economic progress, whether there is a limit to material improvements, and whether our current systems of exchange can recognise any limits before we run up against the buffers. One of the first to make this point was the economist, Kenneth Boulding, who published an article in 1966 entitled "The coming spaceship earth" (reprinted in Markandya, 1992). Boulding argued that for the past century people had regarded environmental resources as if they operated in an open system, which he characterised as a "cowboy" economy. In such a view, resources were regarded as virtually limitless, with the supply increasing to meet growing demand simply by pushing the frontier further forward.

Under this type of paradigm, success could be measured by the ability of nations to maximise their outputs of goods and services, with residuals being dumped out with the system. In reality, Boulding pointed out, the earth was a closed system as far as material inputs were concerned, with only energy flows being exchanged outside its confines. Under these circumstances we should regard our planet much more like a spaceship, and face up to the fact that we operated within a closed system in which we could neither create nor destroy matter. Within this new paradigm, Boulding went on to argue that we could not ignore our residues. As we destroyed our highly structured material resources to create economic growth, so we increased the planet's entropy levels. The appropriate measure of success for Boulding under such circumstances was not the maximisation of material outputs. It should instead be the extent to which we could minimise the inputs we required to sustain high living standards.

For all these reasons, a principle is increasingly being adopted by policy makers in taking allocative decisions which involve environmental resources that are non-renewable or exhaustible. This principle was first adopted by German policy makers, where it is known as the “Vorsorgeprinzip” meaning "the precautionary principle" in English. The precautionary principle is based on the idea of the carrying capacity of ecosystems, and the need to error on the side of caution when determining the extent to which scarce environmental resources can be used for economic development.

Ecologists have taught us that as we make greater demands on the natural environment, we reduce its resilience by lowering its complexity and diversity. In the process, we reduce the environment's ability to cope with the demands we place on it as we produce more material goods for our needs. Since it is normally impossible to establish beforehand what the threshold of any ecosystem is below which we reduce its viability and destroy it, the precautionary principle argues that we should always err on the side of caution in allocative decisions about the environment and environmental resources. Otherwise we can offer no guarantee that our use of such resources will be sustainable.

3.2 ENVIRONMENTAL CONSERVATION STRATEGIES

Sacred Groves – This traditional method varies from region to region mainly with respect to size of grooves, species protected, ownership pattern and local taboos. In spite of having non-similarity in various aspects related to biodiversity conservation, the sacred groves share common problems. However, mainly due to dwindling of local natural resources like firewood people have started exploiting the resources from the sacred groves as well. Hence, it is needed to work on the alternatives to stop the removal of biomass from the sacred groves. It mainly involves the alternatives for firewood. This process needs to be halted by conducting awareness programmes regarding the importance of vegetation of the sacred groves among the local people and mainly among the stakeholders of the sacred groves like committee members, priests, and the owners of sacred groves. There is a need to have a nation-wide study to understand regarding various ownership patterns for concrete and region specific strategies for the conservation. Those owned by the Government department can prevent the destruction of the vegetation using the forest conservation laws.

Rare Species – Protection of rare species is a common practice for being sacred as well as a part of local culture. There should be proper record of all available individual of rare species in all the villages and towns with the respective State or Local Government with a copy with the concerned

Territorial Range Forest Office. Since these are trees on revenue lands mainly, they have legal protection under the laws applicable to tree protection.

Water-Bodies – Nigeria has a large number of water-bodies: rivers, streams, dams and reservoirs. These water-bodies come under the jurisdiction of River Basin Development Authorities. There is no system for de-silting the reservoirs. There used to be systems locally practiced in various parts of the country, which are no more practiced due to the reasons like unidentified stakes in the efforts of de-silting and the further benefit sharing of the silt for the agricultural purposes and the financial support for de-silting in case of bigger water-bodies. It is required to initiate the processes like mobilizing local people to take care of the water-bodies in terms of maintaining them by forming Joint Water-body Maintenance Committees similar to Joint Forest Committees. Care should be taken to make these committees financially sustainable once they are formed by providing seed money by the government.

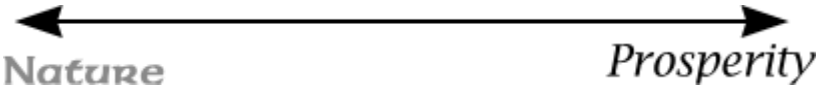
Wildlife – The wildlife such as animals and birds can be protected. Usually the wildlife is hunted for human consumption. In many areas these wildlife have become nuisance particularly where the animals do not get the food to feed on. Hence, in the areas where the nuisance is reported from such wandering troops of wildlife, arrangements for food could be made by the charitable organisations and the forest department. There is also the need to control the group size of these troops as availability of food might result in growth of population increasing the nuisance.

Annual and Ritual Hunting – This practice is common in almost all parts of the south-western Nigeria. In cases where rare or threatened species are hunted, education and awareness campaigns need to be conducted to educate people about the ecological importance of the species. There could be replacement suggest for the species from domesticated animals like goat or chickens as a symbolic hunting.

Botanical Gardens - Botanical gardens are established worldwide as plant conservation and education centers. The site contains a wide range of articles concerning biological education. The global strategy for plant conservation, outlining outcome-orientated targets related to plant conservation are usually available at the botanic gardens. The agenda covers the prioritization of garden mission, and details of conservation and education efforts. The agenda is available in six languages (English, French, Spanish, Portuguese, Russian, Latvian).

3.3 ENVIRONMENTAL PRESERVATION

In these days of growing population and fixed-size planet, the grand debate has shifted to preserving nature vs. prosperity.



This is well and good up to a point. Environmental preservation does have a price, and many forms of consumption do hurt the environment. But go too far in either direction, self-contradiction results: a pristine environment is a form of wealth! Once we get past the crisis stage, further improvement to the environment is a luxury. An anti-luxury mentality is thus self-defeating. Many environmentalists try to get around this paradox by magnifying environmental threats in order to stay in crisis mode. They cry "Wolf!" As a result, many non-environmentalists discount legitimate concerns. Not good.

4.0 CONCLUSION

Conserving natural resources will require a major paradigm shift of global human society, although much can be accomplished locally, regionally, and nationally. Some issues, such as global climate change, must be addressed at this level, whereas other issues, such as conservation of soils and other forms of natural capital, are quite amenable to local efforts. These changes will require a new view of human society's relationship with natural systems (e.g., Cairns 1994) and will foster monitoring to

ensure that previously established quality control conditions for the restoration of natural capital are being maintained. It is abundantly clear that the conservation of natural resources dramatically transcends the capabilities of any particular discipline, and monitoring of this process must be multidimensional. The crucial question is whether reason guided by intelligence will cause the paradigm shift or whether it will be caused by severe consequences resulting from human society's failure to make the shift in the relationship soon enough. In short, the key issue to implementing the precautionary principle of taking action when probable consequences of not doing so are severe, even though considerable uncertainty exists about the probability of occurrence. There is reason for cautious optimism about what can be done, but comparable justification for pessimism about what will be done. Basically, the paradigm shift will require a change in human society's value system, but the science and engineering methods and procedures should be prepared to meet this new challenge if or when the shift occurs.

5.0 SUMMARY

In this unit, we have learnt that:

- environmental conservation is an integral part of biology which emphasizes the conservation of biodiversity and whole ecosystems;
- resources that are conservable in the environment include forest, wildlife, mineral resources and water-bodies;
- study and practice of environmental conservation include in situ, ex situ and reintroductions/habitat restoration; and
- strategies for conservation include traditional sacred groves method, rare species, water-bodies, annual hunting and forest reserve methods.

6.0 TUTOR-MARKED ASSIGNMENT

Write an essay on the strategies for environmental conservation.

7.0 REFERENCES / FURTHER READINGS

Cairns, J. (1994) "Ecological restoration: Re-examining human society's relationship with natural systems". *The Abel Wolman Distinguished Lecture*. Washington, DC: National Academy of Sciences.

Cairns, J. and Bidwell, J. R. (1996) "Discontinuities in technological and natural systems caused by exotic species". *Biodiversity Conservation*, vol. 5, pp. 1085-1094.

UNIT 3 CONFLICT AND COLLABORATION IN NATURAL RESOURCE MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Why does conflict occur over the use of natural resources? How are external factors built into local conflicts? What governing mechanisms are conducive to equitable and sustainable natural resource management by communities? When do local strategies for conflict management need to be complemented or replaced by external or new mechanisms? How can research help identify opportunities for turning conflict into collaboration? Why is collaboration in natural resource management so difficult? This unit grapples with these questions.

Case studies analyzing specific natural resource conflicts in some countries and the interventions of people close to the conflicts are common. Some authors have presented differences in cultural perspectives on Community-Based Natural Resource Management (CBNRM). Among these are community-based politics, learning, and teaching. Ramírez examines the theory and practice of stakeholder analysis and develops a series of propositions that shed light on how it can be used to identify opportunities for turning conflict into collaboration. Bush and Opp challenged development practitioners to answer fundamental questions regarding the causes of conflict before launching an intervention. They argue that answers to these questions would not only inform the intervention, but also allow parties to assess the "peace and conflict impacts" of attempts to introduce more collaborative modes of natural resource management. Tyler examined policy disincentives and outlines the policy changes needed to support local forms of governance over natural resources.

Implicit conflicts are those in which communities are affected by a process of environmental degradation they do not recognize although they might be aware of the degradation, they are unable to associate it with the activity of specific social agents. The environmental conflict is thus made explicit when communities establish an immediate logical connection between environmental degradation and the activities of certain social agents.

2.0 OBJECTIVES

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

- explain the sources of conflicts in natural resources management;
- describe the mechanisms governing the conducive management of natural resources;
- discuss the various strategies for conflict management; and
- identify and explain opportunities for turning conflict into collaboration.

3.0 MAIN CONTENT

3.1 CONFLICT IN NATURAL RESOURCE MANAGEMENT

Conflict over natural resources such as land, water, and forests is ubiquitous (Ayling and Kelly, 1997). People everywhere have competed for the natural resources they need or want to ensure to enhance their livelihoods. However, the dimensions, level, and intensity of conflict vary greatly. Conflicts over natural resources may have class dimensions, pitting those who own the resource against those who own nothing but whose work makes the resource productive. Political dimensions may dominate where the state has a keen interest in a public good such as conservation or in maintaining the political alliances, it needs to remain in power. Differences in gender, age, and ethnicity may inform the use of natural resources, bringing to the fore cultural and social dimensions of conflict. Even the identification of natural resource problems may be contested in light of different information sources, worldviews, and values.

Conflicts over natural resources can take place at a variety of levels, from within the household to local, regional, societal, and global scales. Furthermore, conflict may cut across these levels through multiple points of contact. Conflicts occurring mainly in local contexts may extend to national and global levels because of their special legal relevance or because of efforts by local actors to influence broader decision-making processes.

The intensity of conflict may also vary enormously — from confusion and frustration among members of a community over poorly communicated development policies to violent clashes between groups over resource ownership rights and responsibilities. With reduced government power in many regions, natural resource management decisions are increasingly influenced by the resource users, who include small-scale farmers and indigenous peoples as well as ranchers, large-scale landowners, and private corporations in industries such as forestry, mining, hydropower, and agribusiness. Resources may be used by some in ways that undermine the livelihoods of others. Power differences between groups can be enormous and the stakes a matter of survival. The resulting conflicts often lead to chaotic and wasteful deployment of human capacities and the depletion of the very natural resources on which livelihoods, economies, and societies are based. They may also lead to bloodshed.

3.2 SOURCES OF CONFLICT IN NATURAL RESOURCES MANAGEMENT

The use of natural resources is susceptible to conflict for a number of reasons. First, natural resources are embedded in an environment or interconnected space where actions by one individual or group may generate effects far off-site. For example, the use of water for irrigation in the upper reaches of the Calico River, Nicaragua, pitted upstream landowners and communities against downstream communities in need of water for domestic use and consumption. Linked biophysical or ecological processes in a specific environment disperse cumulative, long-range impacts such as erosion, pollution, or loss of plant and animal habitats. The nature of the problem may not be apparent because ecological relationships are often poorly understood.

Second, natural resources are also embedded in a shared social space where complex and unequal relations are established among a wide range of social actors — agro-export producers, small-scale farmers, ethnic minorities, government agencies, etc. As in other fields with political dimensions, those actors with the greatest access to power are also best able to control and influence natural resource decisions in their favour. For example, absentee Jellaba landlords (merchants, government officials, and retired generals) in northern Sudan made use of their direct connections to the State Agricultural Bank to channel international credit for mechanized farming into their operations in the Nuba Mountains in southern Kordofan.

Third, natural resources are subject to increasing scarcity due to rapid environmental change, increasing demand, and their unequal distribution. Environmental change may involve land and water degradation, overexploitation of wildlife and aquatic resources, extensive land clearing or drainage, or climate change. Increasing demands have multiple social and economic dimensions, including population growth, changing consumption patterns, trade liberalization, rural enterprise development, and changes in technology and land use. Natural resource scarcity may also result from the unequal distribution of resources among individuals and social groups or ambiguities in the definition of rights to common property resources. The effects of environmental scarcity such as constrained agricultural output, constrained economic production, migration, social segmentation, and disrupted institutions can, either singly or in combination, produce or exacerbate conflict among groups.

Intercommunity and interethnic conflict in the Nam Ngum watershed in the Lao People's Democratic Republic has resulted from diverse pressures causing greater natural resource scarcity. The disruption of government institutions by reforms of the traditional economy led to redrawing of administrative boundaries of some villages and the creation of a "no man's land" where tenure rights are vaguely defined. Hydropower development greatly reduced the resource base of villages affected by flooding, leading to deforestation of areas critical to the conservation of upstream water resources.

Fourth, natural resources are used by people in ways that are defined symbolically. Land, forests, and waterways are not just material resources people compete over, but are also part of a particular way of life (farmer, rancher, fisher, logger), an ethnic identity, and a set of gender and age roles. These symbolic dimensions of natural resources lend themselves to ideologic, social, and political struggles that have enormous practical significance for the management of natural resources and the process of conflict management. Ideologic, social, and political practices are contested in most settings, making it difficult to bring to bear on natural resource problems the diverse knowledge and perspectives of resource users. The viewpoint of local Chortis in Copan, Honduras, was suppressed by landowning elites anxious to deny their indigenous heritage. Local perspectives were also initially ignored by Chortis political representatives preoccupied with the national struggle for legitimacy.

Because of these dimensions of natural resource management, specific natural resource conflicts usually have multiple causes — some proximate, others underlying or contributing. A pluralistic approach that recognizes the multiple perspectives of stakeholders and the simultaneous effects of diverse causes in natural resource conflicts is needed to understand the initial situation and identify strategies for promoting change.

3.3 COLLABORATION AS A FORM OF CONFLICT MANAGEMENT

Conflicts over natural resources have many negative impacts. Conflict is an intense experience in communication and interaction with transformative potential. For marginal groups seeking to redress injustices or extreme inequities in resource distribution, conflict is an inherent feature of their struggle for change. Thus, conflict can be regarded as a catalyst for positive social change. Although confrontation can lead to violence, avoiding and shunning conflict can be equally dangerous, as unresolved problems may flare up with renewed vigour. Misunderstandings or confusion regarding rights to natural resources and management responsibilities can escalate into more intense conflicts as the number of people involved and the problems multiply.

Conflicts are only fully resolved when the underlying sources of tension between parties are removed, a state of affairs that may be antithetical to social life. However, if conflicts cannot be altogether eliminated through “resolution” they should be “managed” so that it does not lead to violence but can achieve change. Conflict management can require intervention to reduce conflict if there is too much, or intervention to promote conflict if there is too little. The field of conflict management draws many of its principles from North American experiences with Alternative Dispute Resolution (ADR). Techniques of ADR depend on both cultural and legal conditions, such as a willingness to publicly acknowledge a conflict, and administrative and financial support for negotiated solutions. They also depend on the voluntary participation of all relevant stakeholders.

It is also critical to recognize that although negotiation, mediation, and conciliation are being promoted as “alternatives” in Western societies, they are not completely new. Any legal order, whether based on customary or state institutions, rely, to varying extents, on the same basic procedural modes to handle disputes avoidance, coercion, negotiation, mediation, arbitration, and adjudication. In diverse societies, people use other “mechanisms to handle disputes at a local level, including peer pressure, gossip, ostracism, violence, public humiliation, witchcraft, and spiritual healing” (Castro and Ettenger, 1996).

These local mechanisms of conflict management are not always equitable and effective, especially in conflicts involving multiple dimensions and increasing intensity. Some may hinder equitable and sustainable development and can be legitimately challenged. Nevertheless, Western traditions of conflict management need to be balanced with the systematic study of local practices, insights, and resources used to manage conflict. Cultural, symbolic, and psychological factors that emerge from this analysis can be used to strengthen the integrity of local strategies and redress inequities in local forms of conflict management.

Multi-stakeholder analysis of problem areas and conflicts is a key step in catalyzing recognition of the need for change. Multi-stakeholder analysis is a general analytical framework for examining the differences in interests and power relations among stakeholders, with a view to identifying who is affected by and who can influence current patterns of natural resource management. Problem analysis from the points of view of all stakeholders can help separate the multiple causes of conflict and bring a wealth of knowledge to bear on the identification and development of solutions. Particular attention is paid to gender-based and class-based differences in problem identification and priority setting because in many societies these differences are systematically suppressed or ignored.

3.4 THE LIMITS TO COLLABORATION

The challenge to enhance the capacity of marginal groups to use their power effectively to engage the overtly powerful in meaningful negotiation is required to test the limits of collaborative approaches to natural resource management and show why real collaboration is so difficult. Several of the case studies highlighted so far have shown that, sometimes, confrontation may be needed to get the attention of key stakeholders who can redress power imbalances. In the Galapagos Islands, Ecuador, and in Cahuita, Costa Rica, the threat of violence by local stakeholders drew in remote government and international stakeholders with the power to change the distribution of natural resource rights and responsibilities.

Violent confrontation, however, is unproductive. It is prone to generating consequences that are unanticipated, unintended, and uncontrollable. It usually leads to suffering when used against an opponent that uses similarly blunt tools. In a case involving bloody armed conflict in the Sudan change is coming about very gradually as people's perceptions of the causes and effects of conflict over natural resources change. The fragile peace that is emerging between the Nuba and the Arab Baggara is sustained by recognition that both sides are losing everything important to them (people, cattle, trade). Attention is shifting to external political and economic causes of their violent confrontations.

Contrary to the confrontational scenario, local alliances with advocacy groups, international bodies, and academics offer some scope for dealing with power imbalances more imaginatively and more productively. Widespread screening of two films on threats to an environmentally sensitive wetland in Uruguay posed by the practices of commercial rice growers was critical in swaying public opinion. The momentum created by this campaign was then used by research nongovernmental organizations (NGOs) and local governments to change patterns of public and private investment in development and conservation.

The opinions of academics can also influence key stakeholders, such as legislators and senior government officials, when based on solid experience, detailed information, and lucid analysis (Williamson, 1999). In the Nusa Tenggara of eastern Indonesia, an informal network of individuals from NGOs, research institutions, government agencies, and local communities is facilitating an ongoing regional process of community consultation, research, mediation, and negotiation that engages multiple stakeholders in the management of conflicts over forest resources. Through this process, the unintended impacts of national policies at the community level were brought to the attention of senior government officials, opening the way to government recognition of the need for flexible policies and the value of bringing previously excluded groups into the decision-making process. Research played a catalytic role by helping to make implicit conflicts explicit and by providing credible and detailed information needed to understand the dimensions and various levels of the conflicts and opportunities for change.

Alliances with broader social movements that articulate demands for democratization and environmental accountability can also enhance the voices of the marginal in ways that engage people in dialogue and generate popular discussion. Coalition-building between local groups and progressive social movements is critical to redefining the terms of debate over access to and use of natural resources and to creating or enhancing spaces and mechanisms for negotiating the diverse interests that separate farmers from ranchers, loggers from indigenous peoples, men from women,

local officials from national policymakers, and primary producers from financiers. To sustain and inform popular discussion, more research attention needs to be paid to how external factors (structural adjustment, trade agreements, domestic policies, etc.) are built into local conflicts. Drawing out the historical and structural relationships between communities and the broader processes affecting society opens up the possibility of identifying fundamental problems and formulating alternative social discourse.

Constructing an environment in which conflicts over natural resources can be dealt with productively will also require new structures and processes for governing natural resources management decisions. Given the multiple dimensions of natural resource management, negotiating for change can be wasted effort if policy, administrative, and financial factors at higher levels block or contradict the decisions made locally. Changes to national policies and legal frameworks are needed to accommodate the development of relations between formal and informal institutions at various levels.

Experiences from Indonesia, India, the Philippines, and Costa Rica suggest that governing structures and processes that bring previously excluded groups into decision-making offer new opportunities for improving natural resource management decisions and finding better ways to avoid, resolve, or manage conflict. The experiences in these countries suggest that although consensus is not always possible, governance that is more inclusive, transparent, and efficient can help groups in conflict accommodate some differences, find some common ground, and improve key decisions affecting their livelihoods.

Although the development of transparent and participatory structures for governing natural resources is an essential step, several other challenges arise. New and multiple roles for local and external stakeholders will need to be negotiated and implemented. As the familiar workings of existing institutional arrangements are replaced and the status of stakeholders is transformed, the development of social relations of trust will become even more critical. Local governments and organizations will need to develop new communication and training systems to enhance community capacity to generate information and knowledge relevant to stakeholders. Government officials will need to act as facilitators and implementers of decisions emerging from local systems of governance rather than as decision-makers per se.

4.0 CONCLUSION

The cross-fertilization of case experience with conceptual insight creates a unique dialogue on lessons learned and strategic gaps in our understanding of the conditions that need to be met to move from conflict to collaboration. It shows that conflict management is a critical but constructive way of looking at natural resource problems, involving two basic steps: conflict analysis and planned multiparty intervention. Conflict analysis involves the study, conducted by those directly involved and those seeking to assist in this endeavour, of the various dimensions, levels, and consequences of conflict, with a view to understanding the causes. Multiparty interventions, when based on study of the conflict, involve the use of a variety of techniques, such as mediation and negotiation, leading to changes in the management of natural resources. It is hoped that the critical assessment of conflict management experience presented in this unit will inform the practice of all of us concerned with communities' equitable and sustainable natural resource management.

5.0 SUMMARY

In this unit, we have learnt that:

- conflicts have many negative impacts but it can also be used as catalysts for positive social change;
- the use of natural resources is susceptible to conflict;
- conflict over natural resources is ubiquitous and has class dimensions;

- differences in gender, age, and ethnicity may inform cultural and social dimensions of conflict over the use of natural resources; and
- conflicts over natural resources can take place at a variety of levels, from within the household to local, regional, societal, and global scales. management decisions

6.0 TUTOR-MARKED ASSIGNMENT

With particular reference to Nigeria, explain why collaboration in natural resource management is so difficult.

7.0 REFERENCE / FURTHER READINGS

Ayling, R.; and Kelly, K. (1997) "Dealing with conflict: natural resources and dispute resolution". *Commonwealth Forestry Review*, 76 (3), pp. 182–185.

Bingham, G. (1986) *Resolving environmental disputes: a decade of experience*. Harrisonburg, USA: Donnely and Sons.

Brown, L. D. (1983) *Managing Conflict at Organizational Interfaces*. U. S. A.: Addison- Wesley.

Castro, A. P. and Ettenger, K. (1996) "Indigenous knowledge and conflict management: exploring local perspectives and mechanisms for dealing with community forest disputes". Presented at the Global e-Conference on Addressing Natural Resource Conflict Through Community Forestry, Jan–Apr 1996. *Forests, Trees and People Programme of the Food and Agriculture Organization of the United Nations*, Rome, Italy.

Shaftoe, D., ed. (1993) "Responding to changing times: environmental mediation in Canada". *Interaction for Conflict Resolution*, Waterloo, Canada.

MODULE 4 NATURAL RESOURCES AND ENVIRONMENTAL IMPACT ASSESSMENT

UNIT 1 ENVIRONMENTAL JUSTICE

CONTENTS

1.0 INTRODUCTION

The term environmental justice was created by people concerned that everyone within the society deserves equal protection under each individual country's laws. The central government is responsible to make environmental justice part of its mission by identifying and addressing the effects of all programs, policies, and activities on minority populations and low-income populations. However, the central government should work with their state and local partners to make sure that the principles of environmental justice are integrated into every aspect of their mission.

Environmental justice is more than a set of legal and regulatory obligations. Effective environmental decision-making requires understanding and addressing the unique needs of many different socio-economic groups. Early, inclusive, and meaningful public involvement in environmental decision making is a proven means for making the environment a better place to live and work. The involvement of people potentially affected by environmental projects offers many benefits and does not threaten the accomplishment of other societal priorities, such as safety and mobility. The goals of the Environmental Protection Agencies for all communities and persons across their respective nations can only be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.

If properly implemented, environmental justice principles can improve all levels of decision making - from the first thought about a plan through project development, to operations and maintenance. The pursuit of environmental justice is not a simple task. It may sometimes test the practitioner as well as stretch the imagination of the environmental agency. Many "success stories" did not start successfully. They began to take shape only after taking a closer look at community needs, different perspectives, and the reasoning behind opposition. Achieving environmental justice as part of the agency's mission may demand humility, reflection, and flexibility in the face of criticism. The practitioner may be called upon to explore new methods and new partnerships. Eliminating discrimination, and the appearance of discrimination, often requires probing analysis of environmental issues, broad-based community outreach, and a particular sensitivity to the needs of local populations including the needs of people who have not traditionally been participants in decision-making processes.

2.0 OBJECTIVES

At the end of this unit, learners should be able to

- explain the meaning of environmental justice;
- distinguish between environmental justice and environmental injustice; and
- highlight the principles of environmental justice and relate them to the Nigerian situation.

3.0 MAIN CONTENT

3.1 MEANING AND HISTORY OF ENVIRONMENTAL JUSTICE

Environmental justice implies environmental burdens borne by groups such as racial minorities, women, residents of economically disadvantaged areas, or residents of developing nations. Environmental justice proponents generally view the environment as encompassing "where we live, work, and play" (sometimes "pray" and "learn" are also included) and seek to redress inequitable distributions of environmental burdens (pollution, industrial facilities, crime, etc.) and equitably distribute access to environmental goods such as nutritious food, clean air & water, parks, recreation, health care, education, transportation, safe jobs, etc. Self-determination and participation in decision-making are key components of environmental justice. According to a compilation of thoughts by

several notable Environmental Justice organizations, root causes of environmental injustices include "institutionalized racism; the commoditisation of land, water, energy and air; unresponsive, unaccountable government policies and regulation; and lack of resources and power in affected communities".

An environmental injustice exists when members of disadvantaged, ethnic, minority or other groups suffer disproportionately at the local, regional (sub-national), or national levels from environmental risks or hazards, and/or suffer disproportionately from violations of fundamental human rights as a result of environmental factors, and/or denied access to environmental investments, benefits, and/or natural resources, and/or are denied access to information; and/or participation in decision making; and/or access to justice in environment-related matters.

In the early 1980s, environmental justice emerged as a concept in the United States, fuelled by a mounting disdain within Black, Hispanic and indigenous communities that were subject to hazardous and polluting industries located predominantly in their neighbourhoods. This prompted the launch of the Environmental justice movement which adopted a civil rights and social justice approach to environmental justice and grew organically from dozens, even hundreds, of local struggles, events and a variety of other social movements.

Many activists cite the organized protests and marches held by 16,000 North Carolinians who were outraged over a polychlorinated biphenyl (PCB) disposal site in Warren County. Shocco Township is 75 percent African American, and has the third lowest per capita income in the state. With the permission of the US EPA, the state built the dump which placed the waste only seven feet above the water table, instead of the fifty feet usually required for PCB's. In spite of the protests, the dump site was allowed to open.

Historically, minorities have been absent from the rank and file membership of mainstream environmental associations. At the same time, these organizations have not taken on environmental justice issues. In the 1990's, mainstream environmental organizations such as the Sierra Club, the Audubon Society, Friends of the Earth, and Greenpeace all began to recruit minorities both among their rank and file membership and to serve in staff and decision making positions. A few, including the Sierra Club and Greenpeace have participated in the environmental justice struggle by filing briefs or providing informational and organizational resources.

3.2 PRINCIPLES OF ENVIRONMENTAL JUSTICE

Environmental justice aims at fighting the destruction of the natural world; promoting economic alternatives which would contribute to the development of environmentally safe livelihoods; and, securing political, economic and cultural liberation. To ensure environmental justice, the following principles have been stated:

- Environmental justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction;
- Environmental justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias;
- Environmental justice mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for all living things;
- Environmental justice calls for universal protection from nuclear testing and the extraction, production and disposal of toxic hazardous wastes and poisons that threaten the fundamental right to clean air, land, water, and food;
- Environmental justice affirms the fundamental right to political, economic, cultural, and environmental self-determination of all peoples;

- Environmental justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production;
- Environmental justice demands the right to participate as equal partners at every level of decision-making including needs assessment, planning, implementation, enforcement and evaluation;
- Environmental justice affirms the right of all workers to a safe and health work environment, without being forced to choose between and unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards;
- Environmental justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care;
- Environmental justice considers governmental acts of environmental injustice a violation of international law, the Universal Declaration on Human Rights, and the United Nations Convention on Genocide;
- Environmental justice must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, contracts, and covenants affirming sovereignty and self-determination;
- Environmental justice affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honouring the cultural integrity of all of our communities, and providing fair access for all to the full range of resources;
- Environmental justice calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of colour;
- Environmental justice opposes the destructive operation of multi-national corporations;
- Environmental justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms;
- Environmental justice calls for the education of present and future generations which emphasizes social and environmental issues, based on our experience and appreciation of our diverse cultural perspectives;
- Environmental justice requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible, and make the conscious decision to challenge and reprioritize our lifestyles to insure the health of the natural world for present and future generations.

3.3 ENVIRONMENTAL DISCRIMINATION

Environmental justice advocates that minority populations often undertake environmentally hazardous activities because they have few economic alternatives and are not fully aware of the risks involved. A combination of this lack of awareness coupled with their relative lack of political and economic power makes poor minority communities a frequent target for environmental discrimination.

Indigenous groups are often the victims of environmental injustices. Native Americans have suffered abuses related to uranium mining in the American West. Not only did the miners significantly deplete the limited water supply, but they also contaminated what was left of the Navajo water supply with uranium. Kerr-McGee and United Nuclear Corporation, the two largest mining companies, argued that the Federal Water Pollution Control Act did not apply to them, and maintained that Native American land is not subject to environmental protections. The courts did not force them to comply with US clean water regulations until 1980. Even, in Nigeria, until recently the minority groups in the oil rich Niger delta area of the country are but mere 'tenants' on their own land.

African Americans are affected by a variety of environmental justice issues. One notorious example is the "Cancer Alley" region of Louisiana. This 85 mile stretch of the Mississippi River between Baton Rouge and New Orleans is home to 125 companies that produce one quarter of the petrochemical products manufactured in the United States. The US Civil Rights Commission has concluded that the African American community has been disproportionately affected by Cancer Alley as a result of Lousisana's current state and local permit system for hazardous facilities, as well as their low socioeconomic status and limited political influence.

The most common example of environmental injustice among Latinos is the exposure to pesticides faced by farm-workers. A large portion of farm-workers in the US operates illegally, and because of their political disadvantage, they are not able to protest against regular exposure to pesticides. Exposure to chemical pesticides in the cotton industry also affects farmers in India and Uzbekistan. Illegal, unreported and unregulated fishing (IUU), an environmental justice affecting coastal communities in West Africa, destroys marine ecosystems, upon which millions of people depend, and threats food security and livelihoods. Developing countries lack the resources to properly police their territorial waters. War-torn or post-conflict nations such as Sierra Leone, Angola, Liberia and Somalia are specifically targeted by IUU operations.

In recent years environmental justice campaigns have also emerged in other parts of the world, such as India, South Africa, Israel, Nigeria, Mexico, Hungary, Uganda and the United Kingdom. In Europe for example, there is evidence to suggest that the Roma and other minority groups of non-European decent are suffering from environmental inequality and discrimination. Whilst the predominant agenda of the environmental justice movement in the United States has been tackling issues of race, inequality and the environment, environmental justice campaigns around the world have developed and shifted in focus. For example, the environmental justice movement in the United Kingdom is quite different; it focuses on issues of poverty and the environment but also tackles issues of health inequalities and social exclusion.

4.0 CONCLUSION

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. EPA has this goal for all communities and persons across this Nation. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work. Environmental justice is the social movement that emerged in response to the problem identification of environmental racism. Thus, it is connected, but slightly different from anti-toxics activism. In the next ten years or more, we believe that in our pursuit of development equity should be stressed.

4.1 SUMMARY

In this unit, we have learnt that:

- environmental justice refers to inequitable environmental burdens borne by groups such as racial minorities, women, residents of economically disadvantaged areas, or residents of developing nations;
- self-determination and participation in decision-making are key components of environmental justice;
- root causes of environmental injustices include institutionalized racism; the commoditisation of land, water, energy and air; unresponsive, unaccountable government policies and regulation; and lack of resources and power in affected communities;
- Environmental Justice Movement was launched in the attempt to adopt civil rights and social justice approach to environmental justice, local struggles, events and a variety of other social movements; and

- whilst the predominant agenda of the environmental justice movement in the developed countries has been tackling issues of race, inequality and the environment; and environmental justice campaigns around the world have developed and shifted in focus.

6.0 TUTOR-MARKED ASSIGNMENT

1. Briefly discuss the history of environmental justice.
2. In your own view, choose five principles of environmental justice you consider most important. Give your reasons.

7.0 REFERENCES / FURTHER READINGS

Environmental Justice Forum (2005) "Pirates and Profiteers: How Pirate Fishing Fleets are Robbing People and Oceans". *Environmental Justice Foundation*, London, UK.

Rhodes, E. L. (2003) *Environmental Justice in America*. Bloomington: Indiana University Press.

Shrader-Frechette (2002). *Environmental Justice Creating Equality, Reclaiming Democracy*. New York: Oxford University Press.

United States of America (2007) "Building Healthy Communities from the Ground Up: Environmental Justice in California" *Environmental Health Coalition*. http://www.cbecal.org/pdf/healthy-communities.pdf.

United States of America (2009) "Environmental Justice" *Environmental Protection Agency* http://www.epa.gov/environmentaljustice/.

UNIT 2 ENVIRONMENTAL ACTIVISM

CONTENTS

1.0 INTRODUCTION

Environmental activism is the combined political force of people who take action to protect the environment. Environmental activists work to bring their vision of a better world into reality, even if their actions sometimes involve personal risks and bring no material rewards. Environmental activists are holding their breath to discover whether the global financial meltdown will provide an excuse for governments and businesses to tear up their environmental promises. Skilful exploitation of the crisis could however invert the tipping point into a fresh start for stewardship of our planet. Such optimism presumes that public concern about global warming will prove irreversible and that the potential of social networking and phone technologies to release a new dimension of grassroots activism will be fulfilled.

The institutional profile of environmental activism embraces actors ranging from small grassroots and community organizations to large international pressure groups. Some of these focus on specific issues while others such as Friends of the Earth (FoE) target the full range of environmental problems. Environmental NGOs obtain funding from different sources. For example, Greenpeace, FoE and many grassroots organizations rely mainly on individual donations; other NGOs accept corporate, government or aid agency funding.

Spurred by environmental problems linked to nuclear technologies, pesticide pollution, and overexploitation of natural resources, environmental activism first emerged as a widespread movement in the 1960s. The achievement of the movement in raising global awareness over the last few decades has enabled most notably the rescue of the ozone layer and reduction of acid rain, whilst introducing the language of sustainable development into mainstream politics. Environmentalists now aspire to be a leading force in shaping international agreements.

It is largely accepted that these advances have not translated into high standards in policy making, nor to any fundamental change in individual consumer lifestyles in wealthy countries. Although one of the Millennium Development Goals (MDGs) is labelled "Ensure Environmental Sustainability", the official MDG progress indicators offer little substance for environmental campaigners – symbolising how the vision of sustainable development has been devalued by casual usage. Activists crave a more potent rallying cry, a desire reflected in FoE's core strategic aim "to develop a credible alternative sustainable economic model…. to the prevailing corporate globalisation".

2.0 OBJECTIVES

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

- trace the emergence of environmental activism;
- explain the institutional profile of environmental activism;
- describe the activities of the environmental activists;
- analyse the strategies adopted by environmental activists in their actions;
- discuss the major problems confronting the environmental activists in achieving their goals of maintaining quality environments; and
- explain the influence of climate change on the performance of the environmental activists.

3.1 STRATEGIES OF ENVIRONMENTAL ACTIVISM

A wide range of traditional strategies and tools remains at the disposal of environmental activists in the search for democratic change. The more technical NGOs, such as the World Resources Institute, provide scientific advice, public education, advocacy, lobbying and litigation for political and legal recognition of environmental values and rights. Broad-based membership groups will engage in peaceful protests to stimulate media and consumer campaigns, on occasion turning globalisation to advantage in synchronised actions. Earth Hour 2008 claimed the participation of 30 million people in switching off lights and appliances – led by the example of the Sydney Opera House.

3.1.1 CYBER-ACTIVISM

Overcoming political, geographical, censorship and communication barriers, new media technologies have already achieved substantial victories for the environmental movement. The success of the campaign to save the Great Bear Rainforest in Canada was attributed by Greenpeace to cyber-activism. Now familiar online applications such as blogs, videos, and podcasts bring an immediacy of the work of campaign groups to their supporters and greatly gear up the potential of traditional campaigns such as petitions. More recent tools which combine maps and data into "mash-ups" also lend themselves to environmental issues, for example by locating active regional groups or real risks such as air pollution.

Organisations, which depend on youthful activist memberships, have not been slow to explore the potential of popular social networking websites to communicate their work. The most popular Facebook "Cause" is Stop Global Warming with over 2 million members. Obtaining mobile phone numbers has become as vital to campaign groups as email addresses. Greenpeace Argentina reports that group text messages encouraging 350,000 supporters to contact their representative successfully influenced a vote in parliament. Consumer text messages from point of sale to a central database are a great way of establishing the environmental credentials of a product.

3.1.2 RADICAL ACTIVISM

These fresh opportunities for smart activism may render obsolete the tradition of radical direct actions which have so often raised public environmental awareness. Nevertheless, the days of hard-hitting disruptive protests by groups such as Earth First! which despise "overpaid corporate environmentalists" are far from over. A 2008 landmark verdict by a jury in the UK acquitted Greenpeace activists of criminal damage to the Kingsnorth coal-fired power station on grounds that their actions were justified by preventing harm to other property around the world caused by climate change. Often, such actions remain the only effective means of resisting oppressive governments or corrupt corporations, particularly in developing countries. For example, in India the founder of the Save Narmada Movement, Medha Patkar, was able to exploit global media coverage of her hunger strikes, allied to the cause of poor people threatened with displacement by the Narmada dam.

In the last four decades, environmental activism has emerged and strengthened in developing countries. However, many of these NGOs are financially dependent on governments and multilateral organizations, inevitably restraining their influence over agendas. They also experience more acutely the conflicts of interests that always exist between environmental ideals and the expedient needs of extreme poverty. Pressure to withdraw opposition to genetically modified crops in face of the food crisis is a current example.

3.1.3 ECO-JUSTICE

Social justice issues come to the fore in local campaigning. Over recent years local communities have become increasingly active in finding their own solutions to their immediate environmental and social problems. Typically lacking financial muscle and awareness of their rights, local activists as in the Niger Delta Area of Nigeria often face prosecution by corrupt governments and businesses. The fight for the environment, especially at grassroots level, is inseparable from the fight for the human rights.

The eco-justice movement links the goal of environmental protection to the goals of poverty reduction, social justice, peace, and the recognition of the rights of all marginalised and underprivileged people. Environmental action has to be driven by a strong understanding of what is just and fair, and be delivered through democratic institutions, such as representative grassroots organizations which have an immediate stake in the local environment. There are too many examples of solutions which merely drive the problem away from rich to poor communities.

Failures of eco-justice are also to be found at international level, in the abuse of the developing world by rich countries. From toxic waste dumped on the beaches of Somalia, a country with no government, to the attempted decommissioning of an asbestos-ridden French warship in an Indian dockyard, developing countries find themselves treated as second class environmental citizens.

3.2 GLOBAL POLITICS AND ENVIRONMENTAL ACTIVISM

There is a growing sense of frustration amongst NGOs in developing countries, and indeed marginalised communities in general, who feel that their interests are not adequately represented. They point to the transnational environmental NGO domination of international processes, inter-sectoral partnerships and media coverage. Although a proven mechanism for monitoring the international system, the increasing presence of environmental NGOs in national and international arenas has created difficult conflicts of interests. It is undeniable that the complexity of negotiations on multilateral environmental agreements demands the resources of highly qualified scientists and campaigners; yet the typical northern-based centralised organization necessary to sustain such resources can be accused of lacking legitimacy to represent grassroots interests.
Such uncertainties are seized upon by those politicians who feel threatened by the new pluralism and who are quick to draw attention to any shortcomings in transparency and accountability within the non-profit sector. Similar dilemmas have emerged in recent years through the growing number of partnerships between environmental NGOs and industry, donor agencies and governments. Advocates of these partnerships are driven by concerns over the ability of the environmental movement to deal effectively with the challenge of globalisation and the growing financial and political power of major corporations. Opponents of such close involvement with the private sector feel that it fundamentally undermines the traditional role of environmental activists as watchdogs and guardians of environmental justice.

NGOs are therefore under pressure to strengthen their legitimacy by pushing through much-needed reforms in their own community and to practice what they preach in empowering the poor to speak for themselves. Most environmental indicators in China and India are moving dramatically in the wrong direction, on a scale which threatens to destabilise progress achieved elsewhere. Yet the lives of hundreds of millions of poor people remain desperately in need of the benefits of industrialisation. In India, Greenpeace has targeted the new middle class with the message that the rural poverty will be made worse by the impact of climate change. High profile campaigns seek to ban incandescent light-bulbs, encourage purchase of greener electronic goods, and to raise awareness in coastal cities of the threat of rising sea levels.

In countries with repressive governments such as China and Nigeria, where the concept of civil society is relatively embryonic and where freedom of information is at a premium, the prospects for environmental voices appear dismal. However, against these odds, there are promising signs of tolerance of environmental activists, far more so than human rights or social campaigners. There are believed to be over 2,000 environmental NGOs capable of mounting protest and legal challenge, with a record of accomplishment of some success in prompting environmental regulations, even within the prevailing limits of political criticism. There is speculation that the Chinese government welcomes a degree of local activism to compensate for its own failure to overcome municipal authority collusion with polluting industries.

4.0 CONCLUSION

Campaigners have learned that negative messages about the fate of the planet can be counter-productive, concentrating instead on potential solutions, whether dealing with businesses and governments, inter-governmental organizations, financial institutions, investors or consumers. Lobbying and engaging in alliances with these new stakeholders is often seen as the most promising of the reformist strategies. The use of market mechanisms such as ethical investment could promote sustainable consumption and production. Whether in the supermarket or stock market, the threat of a consumer boycott is feared by the corporate sector and as such is a motivation for working with campaign groups.

5.0 SUMMARY

We have learnt in this unit that:

- environmental activists are holding their breath to discover whether the global financial meltdown will provide an excuse for governments and businesses to tear up their environmental promises;
- environmental activism is the combined political force of people who take action to protect the environment;
- the institutional profile of environmental activism embraces actors ranging from small grassroots and community organizations to large international pressure groups;
- spurred by environmental problems linked to nuclear technologies, pesticide pollution, and overexploitation of natural resources, environmental activism first emerged as a widespread movement in the 1960s;
- a wide range of traditional strategies and tools remains at the disposal of environmental activists in the search for democratic change;
- climate change, the footprint of the rich on the poor, is the ultimate expression of environmental injustice;
- in the last four decades, environmental activism has emerged and strengthened in developing countries; and
- opponents of such close involvement with the private sector feel that it fundamentally undermines the traditional role of environmental activists as watchdogs and guardians of environmental justice.

6.0 TUTOR-MARKED ASSIGNMENT

Discuss the activities and major problems confronting the environmental activists in in the developing countries.

7.0 REFERENCES / FURTHER READINGS

Agarwal, B. (1997) “Environmental action, gender equity and women’s participation”. *Development and Change*, 28, pp. 1–44.

Baumol, W. J. and Oates, W. E. (1988) *The Theory of Environmental Policy*. New York: Cambridge University Press.

Lubeck, P. M. (1992) "Restructuring Nigeria's Urban-Industrial Sector within the West African Region: The Interplay of Crisis, Linkages and Popular Resistance", *International Journal of Urban and Regional Research*, vol. 16(1), pp. 6–23.

Williamson, R. (1999) “The international urban and public policy advocacy: the significance of Inuit cultural persistence”. *Practicing Anthropology*, 21(1), pp. 2–8.

UNIT 3 DEMOCRATIC DECENTRALIZATION OF ENVIRONMENTAL RESOURCES MANAGEMENT

CONTENTS

1.0 INTRODUCTION

Virtually all developing countries are undertaking some type of reform to decentralize public decision-making. Under decentralization reforms, power is transferred from central government to institutions and actors at lower levels of political and/or administrative authority. The rationale behind decentralization is that these reforms foster increased efficiency and equity in development activities. By virtue of their proximity to the people they serve, democratic local institutions are likely to have access to better information about local conditions and better understanding of local needs and aspirations, and to be more easily held accountable by local populations.

For many reasons, natural resources management is particularly well suited to decentralization and local democratic control. Unlike sectors such as health and education, natural resources are a direct source of wealth as well as a target for investment. Thus, natural resources can help finance both development and local governance. However and because most rural people in developing countries rely on natural resources for their livelihoods, democratic local governance requires popular input in decisions about natural resources management and use. But then effective management of diverse natural resources with multiple uses requires specific local knowledge. Controlling access to natural resources often generates overlapping claims and conflicts that must be settled locally.

At least 60 developing countries are decentralizing some aspects of natural resources management (Agrawal, 2002). However, most current "decentralization" reforms are characterized by insufficient transfer of powers to local institutions, under tight central-government oversight. Often, these local institutions do not represent and are not accountable to local communities. Nonetheless, the limited decentralization experiments that have taken place in various locations provide some important lessons.

2.0 OBJECTIVES

At the end of this unit, learners should be able to

- highlight the key issues in democratic decentralization of natural resources management;
- discuss the problems associated with measuring the efficiency of decentralization of natural resources management; and
- describe the outcomes of the decentralization of natural resources management.

3.0 MAIN CONTENT

ISSUES IN DEMOCRATIC DECENTRALIZATION OF ENVIRONMENTAL RESOURCES MANAGEMENT

Decentralization requires both power transfers and equitable representation. To identify appropriate and sufficient powers to transfer, principles of power distribution, called environmental subsidiary principles, would be of great use. Such principles could be developed to guide the division of decision-making, rule-making, implementation, enforcement, and dispute-resolution powers among levels of government and among institutions at each level. Security of power transfers also matters. Local representatives remain accountable and subject to central authorities when their powers can be given and taken at the whim of central agents.

Security, powers and equitable representation go together, yet most decentralization reforms only establish one or the other. A partial explanation is that many central government agents fear, and

therefore block, decentralization. To date, the potential benefits of decentralization remain unrealized because governments have not enacted the necessary laws, or where decentralization laws do exist, they have not been implemented.

The potential of decentralization to be efficient and equitable depends on the creation of democratic local institutions with significant discretionary powers. But there are few cases where democratic institutions are being chosen and given discretionary powers. Ironically, a backlash is already forming against decentralizing powers over natural resources management. Environmental agencies in Uganda, Ghana, Indonesia, Nicaragua, and elsewhere have argued that too much decentralization has caused damage or overexploitation. These calls to re-centralize control over natural resources are premature.

Before decentralizations can be judged, time is needed for them to be legislated, implemented, and takes effect. First, locally accountable representation with discretionary power must be established. Then, accompanying measures must be identified to assure environmental protection, justice, and freedom from conflict. To encourage the decentralization experiment and test the conditions under which it yields the benefits that theorists and advocates promise, decentralization must fully be tested, monitored, and evaluated.

Nevertheless, even partial decentralizations have borne some positive social and environmental outcomes. These include environmental standards, policies to improve equity, civic education, dispute resolution, and legal protections for activist organizations.

3.2 OUTCOMES OF DECENTRALIZATION

To explore the issues surrounding natural resource management decentralization and its social and environmental impacts, the World Resources Institute (WRI) conducted field studies in five African countries in 2000 and 2001. These countries are Cameroon, Mali, South Africa, Uganda, and Zimbabwe. Additional case material from such countries as Bolivia, Brazil, China, India, Indonesia, Mexico, Mongolia, Nicaragua, and Thailand, was supplied by other researchers participating in a WRI-organized conference on decentralization and the environment held in Bellagio, Italy, in February 2002. Most of these studies focus on forestry, while a few explore wildlife and water management.

One key lesson from these decentralization experiences is that despite stated government commitments to decentralization, central governments and environmental ministries resist transferring appropriate and sufficient powers to local authorities. Political leaders and civil servants resist meaningful decentralization for a variety of reasons, including fear of losing economic benefits from the control they presently exercise over natural resources.

Although measuring the effects of decentralization is difficult, it is clear that some decentralization experiments have produced positive outcomes. In India, decentralized democratic authorities have sustainably managed forests for over 70 years (Agrawal, 2002). In Nicaragua and Bolivia, decentralized forest management has resulted in some local councils—where local councils were more open to popular influence—protecting forests against outside commercial interests.

Some decentralization reforms have been associated with environmental problems. In cases from Cameroon, Indonesia, and Uganda, transferring exploitation rights to local bodies has reportedly resulted in overexploitation of timber, primarily because of the need for income for local governments and local people. Some social problems have also been associated with decentralization. In some districts in Brazil, Bolivia, Cameroon, India, Indonesia, Mali, Nicaragua, Mexico, Senegal, Uganda, and Zimbabwe, elite groups have captured the benefits of decentralization efforts for their own use.

4.0 CONCLUSION

Natural resources management is particularly well suited to decentralization and local democratic control. However, there are conflicting outcomes due to the fact that reforms are often characterized by the insufficient transfer of powers to local institutions, under tight central-government oversight. Often, these local institutions fail to represent or be held accountable to local communities. Still, the limited decentralization experiments that have taken place in various locations provide some important lessons.

5.0 SUMMARY

In this unit, we have learnt that:

- Decentralization requires power transfers, equitable representation and security of power transfers.
- Many central government agents fear, and therefore block, decentralization.
- Efficiency and equitable potential of decentralization depends on the creation of democratic local institutions.
- Despite government commitments to decentralization, central governments and environmental ministries resist transferring appropriate and sufficient powers to local authorities.
- Although measuring the effects of decentralization is difficult, it is clear that some decentralization experiments have produced positive outcomes.
- Some decentralization reforms have been associated with environmental problems. Some social problems have also been associated with decentralization.
- In the developing countries, elite groups have captured the benefits of decentralization efforts for their own use.

6.0 TUTOR-MARKED ASSIGNMENT

Using Nigeria as a case study, describe the processes and outcomes of the decentralization of natural resources management.

7.0 REFERENCES / FURTHER READINGS

Agarwal, B. (1997) “Environmental action, gender equity and women’s participation”. *Development and Change*, 28, pp. 1–44.

Baumol, W. J. and Oates, W. E. (1988) *The Theory of Environmental Policy*. New York: Cambridge University Press.

Lubeck, P. M. (1992) "Restructuring Nigeria's Urban-Industrial Sector within the West African Region: The Interplay of Crisis, Linkages and Popular Resistance", *International Journal of Urban and Regional Research*, vol. 16(1), pp. 6–23.

Williamson, R. (1999) “The international urban and public policy advocacy: the significance of Inuit cultural persistence”. *Practicing Anthropology*, 21(1), pp. 2–8.

UNIT 4 ENVIRONMENTAL IMPACT ASSESSMENT

CONTENTS

1.0 INTRODUCTION

The requirement of a state to conduct Environmental Impact Assessments (EIA) in respect of activities that are likely to significantly affect the environment began with Principle 17 of the Rio Declaration on Environment and Development. In 1987, goals and principles of Environmental Impact Assessment developed under the auspices of United Nations Environmental Protection (UNEP) by the Working Group of Experts on Environmental Law. These were adopted by the UNEP Governing Council at its 14th session, and commended to nations to be considered for use as a basis for preparing appropriate national measures including legislation. Such a requirement in the context of trans-boundary impacts has also been incorporated in several regional agreements. Several Regional Agreements were concluded under UNEP's Regional Programmes and resolutions of international bodies, e.g. 1984 ECA Council Resolution on Environmental and Development in Africa, 1984 EEC Council Directive on Assessment of the Effects of Major Public and Private Projects on the Environment.

The objective of the EIA is to ensure that environmental aspects are addressed and potential problems are foreseen at the appropriate stage of project design. EIA should be envisaged as an integral part of the planning process and initiated at the project level from the start. In effect, for most projects, particularly those involving large public investments in areas such as infrastructure, it is required that an EIA be carried out and linked to the cost-benefit analysis.

However, an examination of the various statutes and the framework for the EIA process in particular, and the entire environmental regulatory process in general, reveals that many of the statutes are very much at variance with intentions, especially as they affect the execution of functions. There is duplication of functions and overlapping responsibilities in the processes and procedures guiding the execution of the various impact assessment tasks. Consequently, serious bottlenecks and bureaucratic confusion are created in the process. The result is a waste of resources, financially and materially.

2.0 OBJECTIVES

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

- mention the guidelines and goals of Environmental Impact Assessment Agencies;
- explain the provisions related to emergence of Environmental Impact Assessment in the developing countries;
- assess the performance of Environmental Impact Assessment Agencies in the developing countries;

- highlight the goals of Federal Environmental Protection Agency (FEPA) in Nigeria,
- describe the process and procedural framework of the Environmental Impact Assessment in Nigeria;
- explain the establishment of the Federal Environmental Protection Agency (FEPA) in Nigeria;
- describe the organisation of the Federal Environmental Protection Agency in Nigeria; and
- highlight the activities of the Federal Environmental Protection Agency.

3.0 MAIN CONTENT

3.1 GUIDELINES ON ENVIRONMENTAL IMPACT ASSESSMENTS

The main guidelines of Environmental Impact Assessment are as follows:

- Preliminary activities include the selection of a coordinator for the Environmental Impact Assessment and the collection of background information. This should be undertaken as soon as a project has been identified.
- Impact identification involves a broad analysis of the impacts of project activities with a view to identifying those which are worthy of a detailed study.
- Baseline study entails the collection of detailed information and data on the condition of the project area prior to the project's implementation.
- Impact evaluation should be done whenever possible in quantitative terms and should include the working-out of potential mitigation measures. Impact evaluation cannot proceed until project alternative has been defined, but should be completed early enough to permit decisions to be made in a timely fashion.
- Assessment involves combining environmental losses and gains with economic costs and benefits to produce a complete account to each project alternative. Cost-benefit analysis should include environmental impacts where these can be evaluated in monetary terms.
- Documentation is prepared to describe the work done in the Environmental Impact Assessment. A working document is prepared to provide clearly stated and agreed recommendations for immediate action. The working document should contain a list of project alternatives with comments on the environmental and economic impacts of each.
- Decision-making begins when the working document reaches the decision maker, who will either accept one of the project alternatives, request further study or reject the proposed action altogether.
- Post audits are made to determine how close to reality the Environmental Impact Assessment predictions were.

3.2 CURRENT STATUS OF ENVIRONMENTAL LAWS IN DEVELOPING COUNTRIES

Provisions related to EIA began appearing in developing countries' legislation during the 1970s, shortly after the United States enacted the first national EIA law in 1969. References to EIA were made in the environmental legislation of Malaysia, Ecuador and the Philippines. In addition, the Philippines promulgated supplemental legislation which set forth a more detailed EIA procedure. Throughout the 1980s, more countries decided to establish EIA as an element of environmental policy and a legal requirement for proposed development activities. Again, many countries elected to insert EIA provisions within the framework of their environmental legislations (e.g. Algeria, Costa Rica, Cuba, Guatemala, India, Pakistan, Palau, Senegal, South Africa, Togo, and Turkey), while others such as Brazil, Congo, Indonesia, and Mexico also have elaborated EIA requirements within a complementary decree or regulation.

Since 1990 the pace of legislative activity on environmental issues has quickened and the number of countries with EIA legislation has increased significantly. Recent framework of environmental laws

tends to address EIA in more detail (Albania, Belize, Bolivia, Bulgaria, Burkina Faso, Cape Verde, Chile, Colombia, Comoros, Egypt, Gabon, Honduras, Jamaica, Kazakhstan, Kyrgyzstan, Latvia, Mauritius, Peru, Seychelles, Slovenia, Tajkstan, Thailand, the Gambia, Ukraine, Vietnam, Zambia) and more countries have issued EIA laws, decrees and regulations (Czech Republic, Hungary, Mongolia, Nigeria, Paraguay, Russian Federation, Slovak Republic, Tunisia, Uruguay). One country (Zimbabwe) recently has chosen to issue an EIA policy rather than to enact binding legislation.

According to information collected by UNEP, EIA provisions now exist in the framework of environmental legislation of 55 developing countries. In addition, at least 22 developing countries currently have specific laws, decrees or regulations which contain criteria or procedures applicable to EIA. Other decrees and administrative instruments provided sectoral EIA guideline related to mining, energy, transport, etc.

There are, however, some challenges to the performance of Environmental Impact Assessment Agencies in the developing countries. The major challenges and responses are in the following areas:

- Approach - shifting focus from projects proponent to people affected - both beneficially and adversely.
- Adequacy and clarity of EIA scheme.
- Reliability of information/data.
- Adequacy of methods for assessing impacts and placing appropriate weight on negative environmental impacts in relation to developmental factors.
- Resource capabilities.

3.4 ENVIRONMENTAL IMPACT ASSESSMENT IN NIGERIA

Nigeria, without any doubt, is Africa's most populous nation, independent since 1960 and occupies an area of 923,768 km^2 with varied climates and seasons. According to the 2006 national census, the population of the country is over 140 million. Prior to oil, agriculture (before 1970) was the economic mainstay. Presently, the principal financial resource available is from oil but, regrettably, without any development policy, unguided urbanization and industrialization is taking place. Uncontrolled population growth, desertification, and deforestation have resulted to degradation and devastation of the Nigerian environment.

As desirable and necessary as development is, it became an albatross not of itself but because of the lack of appropriate policies to guide it. There were several sectoral regulations aimed at controlling environmental degradation, which were unsuccessful due to the absence of effective sanctions. Economic considerations and fundamental lack of knowledge of interdependent linkages among development processes and environmental factors, as well as human and natural resources, resulted in an unmitigated assault on the environment. The need for an Environmental Protection Policy in Nigeria was initiated by the illegal dumping of toxic wastes in Koko, in the former Bendel State, in 1987. This prompted the Nigerian Government to promulgate the Harmful Wastes Decree which provides the legal framework for the effective control of the disposal of toxic and hazardous waste into any environment within the confines of Nigeria. This was immediately followed by the creation of a regulatory body, the Federal Environmental Protection Agency (FEPA) in 1988.

FEPA is charged with the overall responsibility of protecting and developing the Nigerian environment. To put this into action a National Policy on the Environment was developed. This is the main working document for the preservation and protection of the Nigerian environment. States and Local Government Councils were also encouraged to establish their own environmental regulatory bodies for the purpose of maintaining good environmental quality as it applies to their particular terrain. The Department of Petroleum Resources (DPR), an arm of the Ministry of Petroleum Resources, recognizing the national importance of the oil and gas industry sector to the continued

growth of the Nigerian economy and realizing that the continued exploitation, exploration and production of the oil resources has serious environmental impacts, also decided to set out comprehensive standards and guidelines to direct the execution of projects with proper consideration for the environment.

3.4.1 ENVIRONMENTAL IMPACT ASSESSMENT IN NIGERIA

The need for environmental preservation (in spite of all efforts by United Nations Environment Program [UNEP] and International Conventions which Nigeria ratified), took centre stage after the momentous and singular event of the secret dumping of toxic waste in Koko Port, Bendel State (now in Delta State) in May 1988 by foreign parties. This was followed by the promulgation of the Harmful Wastes (Special Criminal Provisions Act, 1990). In its wake, international seminars and workshops were held in Abuja and Lagos and the consensus was for appropriate environmental legislation to discourage short-term plans and 'fire brigade' approaches to environmental issues. An institutional framework was set up to deal with the problems of our environment. The Federal Environmental Protection Agency (FEPA), established by Act 58 of 1988 of the same name and amended by Act 59 of 1992, was given responsibility for control over our environment and for the development of processes and policies to achieve this. Apart from publishing the National Policy on the Environment (NPE) in 1989, with the policy goal of achieving sustainable development, it published other sectoral regulations including the National Environmental Protection (Pollution Abatement in Industries and Facilities Generating Wastes) Regulation 1991 wherein EIA was made obligatory only when so demanded by FEPA and compliance was within 90 days of such demand. However in the oil industry the principal legislation is the Petroleum Act 1969 and all derivative regulations charged Department of Petroleum Resources (DPR) among others with pollution abatement.

Separate EIA legislation, the EIA Act 86 of 1992, was promulgated establishing FEPA as the apex regulator, making EIA mandatory for all developmental purposes (although with some exceptions). Under it FEPA has published various sectoral EIA procedures together with EIA procedural guidelines in 1995. At the lower levels, States and Local Government Areas (LGAs) which comprise the second and third tiers of government were encouraged under Act 59 of 1992 to set up their own environmental protection agencies. However, prior to the establishment of the FEPA, there were sectoral environmental regulations with various significant responsibilities relating to environmental protection and improvement. Also in existence were commissions with advisory capacity in environmental matters and environmental Non-Governmental Organisations (NGOs).

The oil industry, because of its various activities and the complex combination of its interdependent operations, adversely affects the environment more than any other sector. In the oil industry DPR adopted remedial, though inadequate, enforcement tools which included compliance monitoring and the issuing of permits/licences. Studies indicated the extent of devastation the oil industry has caused to aquatic and terrestrial ecosystems and cultural and historical resources. This, coupled with the community's dissatisfaction and agitation, especially in the Ogoni and Ijaw homelands, reinforced the need for the sector to plan, protect and enhance prudently the environmental resources for a better environment.

The need to control new installations or projects with capacity to degrade the environment was also identified. This compelled DPR to issue updated Environmental Guidelines and Standards (EGAS) in 1991 providing for the first time, together with pollution abatement technology, guidelines and standards and monitoring procedures and a mandatory EIA report as enforcement tool. There are other regulatory bodies within the sector. FEPA, charged with the protection and development of the environment, prepared a comprehensive national policy, including procedures for environmental impact assessment for, amongst others, all development projects. Enforcement powers were also prescribed. In the National Policy on the Environment (NPE), FEPA adopted a strategy that

guarantees an integrated holistic and systemic view of environmental issues that leads to prior environmental assessment of proposed activities. The other regulators including State EPAs (unnecessarily charged with similar and identical responsibilities to those of FEPA) rather than cooperating with FEPA undermine its efforts as they demand a role in the state of the environment within their areas. This occurs particularly where FEPA involves them only at the review stage in the EIA process. This creates a lot of confusion and bureaucratic delays in implementing the EIA process leading to enormous cost and unnecessary waste of time.

3.4.2 GOALS OF ENVIRONMENTAL IMPACT ASSESSMENT (EIA) IN NIGERIA

The principal legislation is Act 86 of 1992 which made EIA mandatory for both public and private sectors for all development projects. It has three goals and thirteen principles for how these are to be achieved. The goals are to:

- consider the environmental effects of any activity, undertaken or to be undertaken by person or authority, that may likely or significantly affect the environment;
- promote the implementation of appropriate procedures to realize the above goal; and
- seek the encouragement of the development of reciprocal procedures for notification, information exchange and consultation in activities likely to have significant trans-state (boundary) environmental effects.

The minimum requirement of an EIA report includes not only the description of the activity, potential affected environment, practical alternative, and assessment of likely or potential environmental impacts, but also identification and description of the mitigation measures, indication of gaps in knowledge, notification of trans-state adverse environmental effects (if any) and a brief non-technical summary of all the above information. Impartial and written FEPA decisions indicating mitigation measures based on a detailed examination of environmental effects identified in the environmental impact assessment (after an opportunity within an appropriate period had been given to the stakeholders and the public for their comments) is made available to interested person(s) or group(s). It provides, where necessary, that potentially affected States or Local Government Areas are notified.

3.4.3 PROCESS AND PROCEDURAL FRAMEWORK OF THE EIA IN NIGERIA

The EIA process is the various stages a project undergoes from proposal to approval for implementation, resulting in the issuing of an Environmental Impact Statement (EIS) and certificate. The term encompasses several stages, viz:

- determining if FEPA environmental laws/regulations have been effected;
- screening of projects for potential environmental effects;
- scoping to determine the spatial and temporary dimension of environmental effects;
- carrying out detailed base-line studies to determine the environmental conditions prior to project implementation;
- preparing a detailed assessment report;
- carrying out a panel review of the EIA report if this is necessary; and
- obtaining authorization/approval, where appropriate.

The proponent initiates the process in writing to the responsible officer. A notification form is duly completed with all relevant information on the proposal. Using the criteria of:

- **magnitude** – probable severity of each potential impact;
- **prevalence/extent and scope** – extent to which the impact may eventually extend;
- **duration and frequency** – is activity short term, long term or intermittent;
- **risks** – probability of serious environmental effects; and
- **significance/importance** – value attached to a specified area.

However, the Agency undertakes some certain internal screenings to determine the project's category under the mandatory study activities list. Where no adverse environmental effects exist, the EIA is issued and the project commences with appropriate monitoring measures. The steps involved in this exercise are:

- In-house review.
- Panel review (sitting may be public).
- Public review – an elaborate display of the report for 21 working days with appropriate display venues chosen by FEPA for the convenience of the public stakeholders and communities. Through newspaper advertisement FEPA invites interested groups /persons to participate.
- Mediation.

Within the period of the review process, review comments are furnished to the proponent. In this review stage, the public participates only when FEPA's chosen method of review guarantees its participation. The final EIA report, addressing and proffering answers to review comments, is submitted within six months to the responsible officer.

The progress of the project is monitored to ensure compliance with all conditions and mitigation measures. Environmental audit, assessing both positive and negative impacts of the project, is carried out periodically. In its exercise of discretionary powers, FEPA refers any project likely to cause significant environmental effects that may not be mitigated (or where public concern about the project warrants it) to the FEPA council for mediation or panel review.

The EIA study team usually is a multi-disciplinary panel of experts and the report is prepared using a systematic, interdisciplinary approach incorporating all relevant analytical disciplines to provide meaningful and factual data, information and analyses. The presentation of data should be clear and concise, yet include all facts necessary to permit independent evaluation and appraisal of both the beneficial and adverse environmental effects of alternative actions. The detail provided should be commensurate with the extent and expected impact of the action and the amount of information required at the particular level of decision-making.

FEPA certifies consultants and reviewers. Only research institutions and limited liability companies of proven competence are so certified. Sadly in the oil sector, there is confusion as a result of multiple regulators. The Department of Petroleum Resources and the State Environmental Protection Agencies have enabling instruments which permit them to conduct EIA without limitation. DPR's instrument is its regulation, EGAS (1991), which empowered it to conduct EIA, but there is no legislation so empowering it directly. The States instruments are subject to Federal enactment and other than inordinate show of relevance they are to merely monitor the process for, and on behalf of, FEPA.

4.0 SUMMARY

In this unit, we have learnt that:

- provisions related to EIA began appearing in developing countries' legislation during the 1970s and throughout the 1980s, more countries decided to establish EIA as an element of environmental policy and a legal requirement for proposed development activities;
- since 1990 the pace of legislative activity on environmental issues has quickened and the number of countries with EIA legislation has increased significantly;
- the performance of Environmental Impact Assessment Agencies in the developing countries is faced by some challenges;

- for most projects, particularly those involving large public investments in areas such as infrastructure, an Environmental Impact Assessment (EIA) should be carried out and linked to the cost-benefit analysis;
- the working document of an Environmental Impact Assessment Agency should contain a list of project alternative with comments on the environmental and economic impacts of each;
- requirements of EIA in respect of activities are likely to have significant impacts on natural resources and the environment; and
- there should be an assessment of the likely or potential environmental impacts of the proposed activity and alternatives, including the direct, indirect, cumulative, short-term and long-term effects.

5.0 TUTOR-MARKED ASSIGNMENT

Assess the performance of Environmental Impact Assessment Agencies in the developing countries.

6.0 REFERENCES / FURTHER READINGS

Agarwal, B. (1997) “Environmental action, gender equity and women’s participation”. *Development and Change*, 28, pp. 1–44.

FEPA (1991) *National Effluent Limitation Regulation*, Lagos, Nigeria: Federal Government Press.

Lubeck, P. M. (1992) "Restructuring Nigeria's Urban-Industrial Sector within the West African Region: The Interplay of Crisis, Linkages and Popular Resistance", *International Journal of Urban and Regional Research*, vol. 16(1), pp. 6–23.

Williamson, R. (1999) “The international urban and public policy advocacy: the significance of Inuit cultural persistence”. *Practicing Anthropology*, 21(1), pp. 2–8.