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| <b>COURSE CODE:</b>     | EMT 405                               |
| <b>COURSE TITLE:</b>    | Environmental Education And Awareness |
| <b>NUMBER OF UNITS:</b> | 2 Units                               |
| <b>COURSE DURATION:</b> | 2 hours per week                      |

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### **COURSE DETAILS:**

|                            |   |
|----------------------------|---|
| <b>Course Coordinator:</b> | Dr Clement Olabinjo Adeofun                           |
| <b>Email:</b>              |   |
| <b>Office Location:</b>    | COLERM  |
| <b>Other Lecturers:</b>    | Dr Babatunde Saheed Bada <i>B. Agric, M. Sc., PhD</i> |

### **COURSE CONTENT:**

Population and environment (responsible use). Role of educational intervention in environmental action. Methods of dissemination of environmental information; case studies of information to various target groups. Methods of public opinion assessment. Social theory for environmental psychology. Ecological, psychology theory of participation, social response to environmental pollution. Environmental damage and compensation.

### **COURSE REQUIREMENTS:**

This is a compulsory course for all level students in the Department. It is compulsory that students should participate in all the course activities and have minimum of 75% attendance in order to be qualify to write the final examination.

### **READING LIST:**

1. Adeleke, B. O. and Leong, G. L. 1980. Certificate Physical and Human Geography, pp42- 43

2. Adeniji, J. D. 1991. The role of Environmental Education, Training and Public Awareness in Environmental Policy Implementation. In Aina, E. O. A. and Adedipe, N. O. (eds.) 1991: The making of the Nigerian Environmental Policy.
3. Jimoh, H. I. and Ajibade, L. T. 1995. Environmental Education on Soil Erosion Problems in Nigeria: An Overview . Ilorin Journal of Education, 16: 39 - 45

## LECTURE NOTES

### PRINCIPLES OF ENVIRONMENTAL EDUCATION

The scope of environmental education and awareness or environmental extension services covers all fields of environmental science. This include the effects of man on environment - how he has exploited and devastated it, polluted it, but more importantly how man can save itself from the problems which he has caused through the abuse, misuse and over-use of the resources provided by the nature.

Environmental Education should not only focus on the effects of environmental degradation but very importantly the understanding of the fundamental causes. These should also include the examination of social and economic factors that aggravate environmental degradation

1. Environmental education can be described as education from the environment
2. Education about the environment and
3. Education for the environment.

Education from the environment involves the experience gained from our surrounding. This includes the aesthetic value of the environment and the need to keep them as such.

Education about environment involves the study of our environment to learn about its composition and working mechanism and its usefulness. This is an important component of environmental education since we have to learn about the environment before we can make it.

Education for the environmental enables us to learn how to preserve the environment to enable us derives maximum benefit for the present generation as well as for future. This is the conservation aspect of environmental education.

Environmental extension means helping people to help themselves, making available to the people some information and other facilities that will help them improve their living environment.

Environmental education is a two-way system in the sense that the educator is making available to the people his findings at the same time the effectiveness of the message is monitored by the educator and made known to relevant authorities. The responsibility of extension person or educator is enormous because he has to be an expert in nearly all the fields since he is supposed to explain and answer questions on various aspects of the environment.

Unlike agricultural or forest extension workers whose task is mainly with rural people, environmental education and awareness cover rural and urban dwellers, the industrialists and all those who use any form of natural resource as raw material whose product, bi-products and waste product affect the living standard of the people.

### **TARGET POPULATION FOR ENVIRONMENTAL EDUCATION**

Three categories of audience have been identified for environmental education and awareness. These are

- (a) General Public
- (b) Specific occupational or Social Group
- (c) Certain Professional and Scientists

#### **(1) General Public**

There is need for environmental education programme which introduces awareness among the general public for its own environment and danger to which it may be exposed. This should involve adequate background knowledge and information about the environment enables them to take part in decision making concerning their environment. It should include information on present or planned activities with major potential impact on the environment.

Participants in the general public education should include the general public especially non-governmental organizations. For the general public, environmental education should be provided at every age class and at all levels of formal education for pupils and teachers and informal education for young people and adult including the handicaps.

#### **(2) Specific Occupational or Social Groups**

These are those whose activities and influence have an important bearing on the environment. These include engineers, architects, administrators and planners, industrialists, trade unionists, policy makers and agriculturists. Their form of education should be both formal through in-service trainings and short courses and non-formal through seminars and workshops.

### (3) Certain Professional and Scientists

These group includes those working on specific problems of the environment e.g. biologists, ecologists, hydrologists, taxonomists, sanitary engineers etc.

## **NEEDS AND RATIONALE FOR ENVIRONMENTAL EDUCATION & AWARENESS**

### **Need Environmental Education**

The needs to protect the environment hence the rationales for environmental education arise as a result of the following:

1. Environment is the basis of all life and therefore deserves proper care and management.
2. If the environment is threatened on a continuous basis, numerous problem which would constitute a danger to human existence could arise.
3. The environment is part of our cultural heritage which should be handed down to prosperity.
4. Some resources of the environment are not easily replaceable and should be managed on a sustainable basis, to prevent the extinction of certain components of the environment such as plants and animals.
5. There is need to enhance the sanity and aesthetic quality of our environment in order to promote healthy living.
6. The environment is part of nature and needs to be preserved for its own sake.

### **Ration for Environmental Education**

The rationale for environmental education can be summarized as the following:

1. A major goal of environmental education in Nigeria as entrenched in the 1987 National policy on education is the provision of the expertise that can utilize scientific knowledge

- towards the preservation and solution of environmental problems. Knowledge about the changes that have altered the environment — land, water, weather, vegetation, social, cultural and political environment are essential components of environmental education. Consequently, the general populace should be equipped with all these to be able to solve the problems of the environment.
2. Nigeria's socio-economic development (like any other less developed country) is firmly rooted on the exploitation of the natural resources in our environment. Land, water, forest and other mineral resources utilization is the dominant feature of rural economy with agriculture the driving force. Uncontrolled and improper exploitation of these resources have implications on the environment causing disruption in the living standard, starvation, displacement and human suffering. Environmental education is therefore necessary to create awareness of the causes and effects of these problems viz: food and water scarcity, pollution, outbreak of epidemics and natural disaster such as flood, erosion and desert encroachment. And of course how to prevent them.
  3. Environmental education is needed to foster international co-operation and understanding. The developed countries rely on the high technology for the exploitation of natural resources while less developed countries like Nigeria totally depend on agriculture, forestry and the mineral resources thereby leading to intensive and over-exploitation of the natural resources and these have serious implications on the resources.
  4. Public enlightenment on the impact of government policies on local environment should be useful both to the government and the local people. Some of these policies include the Structural Adjustment Programme (SAP), The IMF loan, Debt servicing and rescheduling etc.
  5. Awareness of such global environmental issues is an essential component of environmental education which ordinary citizen should be aware of.
  6. Environmental education for the over-all social and economic emancipation of women and children. These form a substantial percentage in the utilization of natural resources especially at the rural setting.

7. Environmental education is very essential for the lack of it. Environmental education is virtually a new thing in this part of the world.
8. Environment education is also very essential for our survival on earth. The natural resources and cultural heritage need to be protected not only for this generation but for future generation.

### **OBJECTIVE OF ENVIRONMENTAL EDUCATION & AWARENESS**

The general objectives of environmental education include the following:

1. To enlighten the people on the physical components of the environment
2. To inform them about their dependence on the environmental resources
3. To enlighten them about the changes in the environment in the last decade and the consequences of their present actions.
4. To alert them about the consequences of human actions on the environment both on man himself and other forms of life
5. To create concern for environmental quality and conservation and to foster understanding of man's relationship and interactions with the ecosphere
6. To develop personal, community and national sanitation and conservation ethics
7. To kindle a sense of responsibility that will motivate ordinary citizen to seek and acquire more knowledge about the environment and its problems and propagate such knowledge to others in the community
8. To awaken appreciation of the aesthetic quality of nature in order to encourage its uses for recreation.

The objectives of environmental education are summarized by UNESCO/UNEP as follows:

1. Awareness: Environmental education should foster appreciation of environment. It should help different groups and individuals to acquire awareness of and sensitivity to the overall environment and its allied problems. In Nigeria, the knowledge of the various ecological zones

(from mangrove coastal vegetation, rainforest in the south, through derived savannah to Guinea, Sudan and Sahel savannah in the North is desirable. This will also enhance the appreciation of the type and quality of life (effects of each zone on human life) in these zones.

2. Knowledge: Environmental education should help social groups and individual gain a variety of experience in and acquire a basic understanding of the environmental and its associated problems. The people should be informed of their roles in causing environmental problems around them — deforestation, overgrazing, bush burning, desertification, erosion, loss of soil fertility etc
3. Attitude: Environmental education should help acquire a set of values and feelings of concern for the environment and the motivation for active participation in environmental improvement and protection programmes. Individuals and groups need to adopt ethical values that awaken strong feelings for the environment and all its living and non-living components
4. Skill: Environmental education should foster and assist in conservation practices and the skill needed to prevent environmental degradation e.g. erosion control through the uses of biological and mechanical methods. The people should be taught how to mobilize their human and natural resources to prevent ecological problems.
5. Evaluation: Environmental education should enable the people to assess government programmes and land management practices that are being introduced .
6. Participation: Environmental education should provide opportunity for social groups and individuals to be actively involved at all levels involved in working towards resolution of environmental problems.

### **STRATEGIES FOR ENVIRONMENTAL EDUCATION AND AWARENESS**

Various strategies have been proposed for the introduction of environmental education into school curricula and into non-formal education. These include the following:

1. Introduction of environmental studies as a distinct and special subject, taught by specially trained teachers.

2. Introduction of environmental issues into the various traditional subjects
3. The re-orientation of the subject matter in the traditional schools to be in accord with the scope, aims, objectives, strategies and guiding principles of environmental education.
4. The re-evaluation and re-structuring of the entire contents of various subjects to incorporate environmental education
5. Integration of the contents of the various subjects within the framework that relate to the major environmental problems.

#### **GUIDING PRINCIPLES OF ENVIRONMENTAL EDUCATION**

1. Consider the environment in its totality, natural and built technological and social structures (economic, political, technological, cultural, historical, moral and aesthetic)
2. Environmental education to be a continuous life saving process, (beginning at the pre-school level continuing through all formal and non-formal stages).
3. Environmental education to be interdisciplinary in its approach.
4. Examine major environmental issues from local, national and international point of view.
5. Environmental education to focus on current and potential environmental situations.
6. Promote the values and necessity of local, national and international cooperation in the prevention and solution to environmental problems.
7. Explicitly consider environmental aspects of plan for development and growth.
8. Enhance the position of learners in making decision concerning their environment and accept responsibility.
9. Enable learners to discover symptoms and real and potential causes of environmental problems.
10. Enhance the learners ability to develop critical thinking and problem solving skills.
11. Utilize different learning environment and approaches to learning/teaching about and form of the environment with emphasis on first hand information



## **OBJECTIVES OF ENVIRONMENTAL EDUCATION AT SCHOOL**

### **Objectives of environmental education at Primary Level**

- (a) To know and understand true aspects of the environment in general.
- (b) To know and understand the interaction between mammals, between human and their environment and interaction between the various elements and components of the environment.
- (c) Build understanding, awareness and sensitivity towards causes and efforts of the class that continuously take place in society the world around us.
- (d) To build and develop skills in thinking, reasoning, enquiring, evaluating and making decisions concerning human and the world around them.
- (e) Inculcate two attitude in using the knowledge and skills towards solving problem and issues relating to individuals, society and the environment.
- (f) To build the values and attitudes towards the need and necessity to live together in harmony in the context of the heterogeneous society.

### **Focus**

1. Human, animal and plants undergo a number of life-processes.
2. Human, animals and plants are continuously adapting themselves to the environment.
3. Human alter and modify the environment with great caution and care in order to fulfill numerous living needs.
4. Identification between human and nature and between environmental elements giving rise to various phenomena which affect them.
5. Society would take active steps to conserve the environment and the balance of nature through careful plans and processing.

### **Objectives of Environmental Education at Secondary Level**

Environmental education to be taught as integrated science in which environmental education concepts are included.

### **Objectives**

1. To emphasize the relevance of science to daily life.
2. To develop a scientific attitude in student.
3. To create an environment conducive to greater reliance on the use of principles and practices of science.
4. To acquaint the student's with various natural phenomena.
5. To develop an outlook which emphasizes the method employed in different disciplines of science.

#### **Aspects of Environmental Education Emphasized At SSS**

- (a) Population - growth, arises and problems of unplanned population.
- (b) Law - Land use, land reclination and land and soil conservation.
- (c) Resources - resource uses, conservation, recycling.
- (d) Food and Nutrition - Food production, food adulteration and preservation, balance diet etc.
- (e) Conservation - Causes of wildlife, plant, soil, water and conservation of other non-renewable natural beauty
- (f) Pollution - Pollution of water, air and soil, noise pollution, pollution by insecticide and other chemicals and waste disposal
- (g) Health and Hygiene - Individual, family county and social health and hygiene, health hazards etc
- (h) Humans and Nature - Other compounds of atmosphere, environmental quality and future on earth.

#### **Constraints To Implementing Environmental Education**

1. Rigid Specialization.
2. Cornplexity of inter-disciplinary value of Environmental education.
3. High pupil - teacher ratio for organising pupil participation programs.
4. Paucity of qualified trained environmental educator.

5. Lack of proper resources in terms of equipment, supplementary materials and reference materials.
6. Tendency to resist changes

## **EFFECTS OF MAN ON THE ENVIRONMENT**

### **COMPONENTS OF THE ENVIRONMENT**

Definition: Environment is the total combination of natural objects (living and non living), objects made by human beings, the interrelationship between these conditions and various circumstances which surround people on earth..

The components of the environment are:

1. Living natural physical things:
  - Plants (different types of vegetation)
  - Human beings and other types of animals
  - Small living things like fungi (e g mushroom), bacteria and viruses
2. Non-Living physical things
  - Land surface and different kinds of rocks
  - Water in the forms of lakes, lagoon, river, sea, ocean etc
  - Atmospheric gas
1. Features made by human beings — human settlement and infrastructures, road, bridges etc.
2. Cultural relationship and institutions — political, economical, social/law, religion e.t.c

### **TYPES OF ENVIRONMENTAL DISRUPTIONS**

1. Over-population: This is the presence in a given area of more people that can be supported adequately by the available resources
2. Pollution: This is the introduction of substances or impurities that reduce the quality of the environment — air pollution by smokes, industries etc
3. Depletion of resources: a material is depleted as it becomes less available for its intended uses.

This may be caused by:

- a. destruction
- b. Dilution or displacement
- c. Pollution

4. Change in global condition leading to climate change and extinction of species.
5. War: this combines all the environmental problems. Disruption of the environment by war may be caused during the preparation for the war and during actual hostility

## **LAND (LITHOSPHERE)**

### **Nature of land**

The following can be said about the nature of land:

- (i). Its supply is virtually fixed or limited and therefore does not easily expand with demand
- (ii). As population increases the area of land for each person's use decreases.
- (iii). The area of land which is occupied by hot deserts, coastal swamps and permanent snow, cannot generally be used for productive activity.
- (iv). Land requires skilful management to maintain desired productivity.

### **Uses, functions and potential**

- (i). Agricultural Use
- (ii). Forestry
- (iii). Residential Land Use
- (iv). Commercial Land Use
- (v). Industrial Land Use
- (vi). Religious Land Use
- (vii). Educational Land Use
- (viii). Administrative Land Use

### **Problems, consequences and solutions**

Problems created or made worse by human beings and their solutions include the following:

| <b>PROBLEMS</b>  | <b>CONSEQUENCES</b>   | <b>SUGGESTED SOLUTIONS</b>  |
|--|---|---|
| Improper land management: use of tractor, bush burning, deforestation, monocropping, over-cropping, over-grazing, planting along slopes. | All these lead to soil wash, destruction or loss of soil organic matter and loss of biological diversity. | Raise awareness about the dangers of the problems.<br>Enforce laws against bush burning and illegal exploitation.<br>Convince farmers to plant more than one crop on the farm (multiple cropping). Encourage crop rotation and fallowing.<br>Encourage farmers to plant across slopes to prevent soil wash. Encourage the practice of alley fanning and agroforestry. |
| Declining productivity<br>Soil mining and over exploitation  | This lead to serious and threat food security   | Farmers should replenish soil nutrients by adopting organic farming (applying manure mulching) Chemical fertilizer should be applied where advisable and appropriate. Crop rotation, green manure, cover cropping and fallow should be practiced.   |
| Improper waste disposal by house holds, industries and markets.  | This lead to poor environmental sanitation  | Laws on waste disposal should be made and effectively implemented. Refuse sorting should begin in the home.   |

|   |   |  |
|---|---|--|
|   |   | Alternatives to site disposal (such as landfills composting) should be adopted. Industries should treat wastes and dispose of them properly.   |
| Soil erosion by rainfall, runoff in humid regions and wind in dry regions and the seas in coastal regions | This leads to land degradation  | Plant bamboos and other grasses as well as appropriate trees in erosion—prone areas. Plant trees to act as windbreak and shelterbelts. Make ridges and contour across the slope. Construct other physical barriers such as embankments, etc. |
| Desertification.  | This leads to invasion of marginal lands, declining productivity and threat to food security. | Plant trees as shelterbelts; Adopt good land management practices, Encourage the culture of environmental impact assessment for anti desertification projects (e.g. irrigation and construction)   |
| Mining (including oil exploitation).  | This leads to land damage.  | Enforce land reclamation laws and regulations, Close mining pits after minerals have been taken out; Exercise care in oil  |

|                |  |   |
|----------------|--|---|
|                |  | prospecting and mining<br>areas to avoid spillage, Stop<br>gas flaring  |
| Deforestation. | This gives rise to loss of biological diversity, as well as loss of the forests as carbon sinks. | Plant trees and other forms of vegetation. Encourage the use of kerosene, gas, and electricity in cooking; Control indiscriminate clearing of land, including hush burning, Control animal grazing. |

### **PROBLEMS CREATED BY NATURAL FORCES**

Water and wind erosion

Salt spray from the ocean which contaminates coastal lands, corrodes metallic objects and causes paints to flake

Seasonal flooding of farms and urban land

Deposition of eroded material downslope, sometimes on fertile land

Bush burning caused by thunderstorm.

### **WATER (HYDROSPHERE)**

#### **Nature of water**

(1) Unlike land, water is one of our most abundant resources.

(2) Water covers more than two-thirds of the earth's surface.

In the water cycle (hydrological) water rises as vapour from the sea into the air and then falls as rain on the land, and returns as run off into the seas.

(3) Water is a limited resource and the tiny fraction suitable for drinking or irrigating crops is unevenly distributed among the regions of the world.



(4) Water is not an endlessly renewable resource. The amount of water entering and leaving an area each season depends on the geographic location and climate.

(5) Our immediate sources of water are roof-catch during the rains, wells, boreholes, reservoirs behind dams, rivers and lakes.

### Uses, functions and potential

Water is important to all living things since without water most of them can hardly survive. We can identify five major uses of water:

- (i). Domestic Use
- (ii). Agricultural Use
- (iii). Industrial Use
- (iv). Generation of Electricity
- (v). Recreational/Transportation Use
- (vi). Fishery
- (vii). Military and other uses

### Problems, consequences and solutions

| PROBLEMS                                | CONSEQUENCES   | SUGGESTED SOLUTIONS  |
|---|--|--|
| Irregular and insufficient water supply | This gives rise to crop failure in the farm, and low standards of sanitation in the home | Strengthen people's awareness of the need to conserve water, Watch out for and report cases of water wastage (e.g. broken pipes); Develop dependable |

|   |  |   |
|---|--|---|
|   |  | <p>storage system; Use water wisely in and outside the home; Protect forest on watersheds, especially in headstream areas.</p> <p>On the farm, use water conservation measures e.g. mulching, tree planting and appropriate irrigation, Take care not to damage water supply systems (headwaters, etc.)</p> |
| Torrential rainfall (heavy rainfall)      | Flooding and serious soil erosion.   | Capture and store as much of the water as possible e.g. through check-dams, catch- pits, tanks and wells, Adopt erosion control measures.   |
| Water pollution by chemicals, solid waste | Water-related diseases such as typhoid, cholera, dysentery, skin problems, etc | Educate industrialist, farmers and others to avoid contaminating water bodies, treat water before public distribution, in the home, boil and filter water before drinking.  |
| Conflicts over water rights               | social disharmony unrest and unrest  | Mutual understanding should be encouraged; Water - sharing agreements should be drawn up.   |
| Over pumping of groundwater.              | Ground water depletion   | Do not sink bore holes and wells indiscriminately,  |

|  |  |  |
|--|--|--|
|  |  | Undertake Environmental Impact Assessment (EIA) before boreholes are sunk. |
|--|--|--|

## **ATMOSPHERE (AIR/AROUND US)**

### **The aims:**

- To examine the nature and composition of air around us
- To examine the causes and consequences of air pollution
- To suggest means of reducing air pollution caused by man.

### **Nature and composition of the air**

- The earth is surrounded by gaseous blanket called the atmosphere
- The atmosphere consists of mixture of various gases, moisture and small particles.
- There are four atmospheric layers

#### **(a) The troposphere**

- lowest layer
- extends to about 10km above sea level
- most important layer to man
- temperature falls with increasing height

#### **(b) The stratosphere**

- lies above the troposphere up to 80km
- high concentration of ozone
- it is cloudless, very cloud with thin air

#### **(c) The Ionosphere**

- extends to about 400km above sea levels
- it is composed of electrically conducting layer

- temperature here gets to 0 °C

(d) The Exosphere

**Composition of the atmosphere**

Nitrogen - 78%

Oxygen - 21%

Other gases – CO<sub>2</sub> 0.03%

Inert gases - 0.93%

**Uses of atmosphere**

- It contains the air we breath
- It enhances water cycle
- It enhances production of food through photosynthesis
- The ozone layer is important for protecting life on earth.

**Air pollution**

To pollute is to destroy the purity or sanctity of something, to make foul or filthy, contaminate or defile.

**Causes of air pollution**

Any process that releases gases, dust or mist to the air is a source of air pollution.

(a) Energy Consumption

- Use of petroleum for car fuel and other means that burn it.
- Use of wood or charcoal.
- Bush burning
- Metal smelting and blasting
- Mining and quarrying
- By-products from industries
- Spraying of insecticides

- Personal air pollution by smoking

## **Effects of air pollution**

### **1. Human health**

- Dizziness, headache, eye irritation nasal irritation, sore throat, cardiac problems and cancer.

### **2. Acid rain.**

#### 3. Injuries to plants and other materials.

- SO<sub>2</sub> destroying plants
- Fluorides causing collapse of plant tissue
- Smog bleaches plant leaves
- Reduction in fruiting due to high concentration of NO<sub>2</sub>
- Acid rain causing plant death

### **4. Global warming**

- Change in distribution of plants and animals
- Loss of biodiversity
- Melting of coastal glacier resulting in rising sea level

### **5. Depletion of ozone layer**

- Direct exposure to UV rays causing skin diseases and death of plants and animals.

## **SUGGESTED SOLUTIONS**

1. Education of the populace
2. Automobile put in proper working condition to reduce incomplete combustion and use of leaded petrol.
3. Prevention or reduction of gas flaring
4. Planting of trees so as to form carbon sink
5. Reduction of deforestation to reduce emission
6. Prevention of bush burning
7. Use of efficient stove and encouragement of the use of alternatives to fuel wood
8. Use of environment friendly materials and reduction of CFCs

## **PLANTS, ANIMALS, MICRO-ORGANISMS AND THE BIOSPHERES**

The aims: To outline the relationship between various components of the biosphere.

To outline the importance variation between and within the various components.

Causes and effects of abuses to the biosphere.

Suggested solutions to reduce the abuses.

### **NATURE OF THE BIOSPHERE**

The biosphere is the parts of the earth – land, sea, and air that support plant, animal and micro-organisms and their interaction with non-living environment.

Biological diversity is the variation of plants, animals and micro-organisms in form, structure, behaviour and distribution.

The variation may be caused by:

- genetic or
- environmental factors

There are three levels of variation

1. Genetic diversity variation between individuals within the same species due to difference in chromosomes e.g.

*Acalypha species*

*Croton species*

*Musa species*

*Citrus species*

2. Species diversity: Variation in kind (of species of plants and animals e.g.)

Goat

Dog

Croton

Acalypha etc.

### 3. Ecosystem diversity:

- Variation in environmental condition between places. This is due to climatic factors e.g Terrestrial. (land), ocean, freshwater and estuary ecosystems.
- Each ecosystem is different in structure and composition and there are variations within each ecosystem

### **FOOD CHAIN**

Within each ecosystem there are principally three levels of food organization:

(a) The autotrophs-green plants, called primary producers

(b) The Heterotrophs, the consumers, subdivided into:

- herbivores - feeding on plants e.g. goat
- carnivores -feeding on animals
- Omnivores - feeding on both plants and animals or on anything e.g. Man.

C. The decomposers: The micro-organisms that break down dead members in the ecosystem and decompose them to form nutrients for recirculation to the ecosystem.

### **Uses of the biosphere**

- Plants are important as primary producers for the synthesis of food.
- Micro-organisms are important for nutrient re-cycling.
- Interaction of the various components enhances ecosystem stability.
- Biodiversity enables variations in plants and animals and between different geographic locations, variation is important for the following reasons:
  - Choice of species for different purposes e g medicine, food and other uses.
  - Breeding for improved yield and disease resistance.
  - Enhancing biotechnology.

## **Problems caused by man to the biosphere and consequences**

A major problem is the destruction of the biosphere for man's many uses development, feeding, shelter, etc.

The consequences include:

- Soil and land degradation leading to erosion and loss of soil fertility.
- Deforestation causes depletion, of the resources, reduction of trees to act as carbon sink and increasing carbon dioxide emission, thus global warming.
- Bush burning leads to destruction of properties and emission of various gases.

## **Suggested solutions**

1. Education of the populace.
2. Creation of biosphere reserves and sanctuaries, forest reserves and wildlife reserves and national parks.
3. Planting of woodlots
4. prevention of bush burring
5. Enforcement of related laws

## **TEACHING AND LEARNING**

Education is the transmission of values of accumulated knowledge. Education can be described as enculturization (i.e. introducing culture of certain type) to a group of people. In this case you teach them and mould their behaviour.

Education has also been described as acquisition of knowledge and skill either by training, instruction or experience. Education can also be classified into formal and informal education. Formal education takes place in an institution as determined by the authority. It also has definite duration. In informal education on the other hand, there is no formal syllabus and no age limit. However, informal education needs more skill to be able to handle different age classes.

The instructor needs to be thoroughly informed to know what to teach and how to do the teaching so that his teaching will be accepted rather than rejected.



There are four types of audience

- a. The innovators - these accept the teaching without unnecessary questioning
- b. Early adoptors - these need to be convinced a little before they accept the teaching
- c. The undecided - they sit on the fence
- d. The rejector - don't accept anything new.

If an environmental educator is clever enough, he would be able to categorise the audience and apply different methods of approach to difference categories of audience. He must recognise and accept individual differences, their ability to take risks, independent reasoning etc.

The educator should approach them according to the category. For example innovators should not be treated like the rejectors or early adoptors etc. If the opinion or suggestions of the audience is rejected outright; they may not- accept any- new idea being introduced. This may lead to failure in communication. He should also learn the use of different teaching aides – film, slides, demonstration, brochures, handouts or handbills to enable the people to retain there attention and interest. The teaching should not be done haphazardly or abstractly. The audience should be given opportunity to touch, feel, see what is being introduced where applicable. Teaching and learning is a two-way kind of communication.

Teaching (A) \_\_\_\_\_ Learning (B)

Sender

Receiver

The teacher sends the new idea to his audience later on the audience communicates the result to the teacher. There is, however time lag between when the teacher sends the message and the learner receives, interpret and accept the message

When 'A' sender sends message to 'B' three things may happen

- (a) the receiver receives the message as intended hence appreciate it;

(b) the message is above B and cannot understand it;

(c) the message falls short of B and cannot be got.

In both b and c the purpose of the message cannot be achieved. The environmental educator should be skill enough to know the type of message to send and appropriate way of sending it. There could be difficulties due to lack of information (fall short) or lack of understanding (too advanced information). To avoid this situation, the message must be analysed in three parts:

Analysis of message

(a) The purpose

(b) The content

(c) The treatment

The purpose of the message is the objective, the changes in behaviour the message is intended. The changes may be change in attitude, mental, emotional and physical behaviour.

The content or subject matter in which the message is concerned: This includes:

- What you need to tell them
- The importance of the message
- Means of carrying out the message.

The treatment is the method of delivering the message, the atmosphere prevailing is the process of teaching. This makes the message acceptable or otherwise, it could be lengthy or brief.

In preparing for and conducting a teaching, the environmental educator should place much emphasis on

(a) Making his audience feel at ease-like providing sitting places.

(b) Making them feel they know something and can contribute to the subject matter.

(c) Ensuring to break things down for clarity and communicate in simple languages.

(d) Thinking like the audience, emphasise with them i.e. putting yourself in their position.

Explain the principle of teaching and learning as it relates to dissemination of environmental information.

**WHAT GOES ON AFTER THE MESSAGE HAS BEEN DELIVERED**

There are some ways of getting to man's mind through the five senses

- Eye                                  sight
- Nose                                      smell
- Ear    hearing
- Tongue                                  taste
- Hand    touch

These are the receptor of stimuli through which observations are made. As the stimuli are received, they produce a kind of perception which is interpreted and given meaning. The receiver then reacts according to his intention if the message is properly delivered. Perception after the message has been grasped and given meaning. Perception depends on background and experience. If the receiver is experienced on the topic, perception is easily increased. As further instruction is received, perception is improved leading to greater understanding. This enables him to make up his mind and make decision.

When a communicator is talking to receivers, he must have got his ideas from papers research, experience etc. The basic aim is to help improve the standard of living of the receiver. The communicator must select appropriate channel to disseminate ideas. It is then left for the receivers to either accept or reject. However, extension officer must take into consideration individual differences. The individual difference is based on the sensitivity of their senses.

### **Individual differences**

The purpose of communication is to send across a message, and the message expected to be received and utilized by the audience. However, individuals are different in their sensitivity. This depends among other things on individual's ability to receive stimuli. The environmental educator must take into consideration the individual sensitivity of senses.

- (a) Sight: As people get older, they loose their sight gradually. While addressing elderly audience, illustrations should be bold and large enough.
- (b) Hearing: some have hearing problem. The communicator should talk loud enough and audible.

(c) Reaction Time: Reaction time of individuals differs. Generally, younger people have shorter reaction time than elderly people.

(d) Attitude to learning: Generally, elderly people have greater reluctance to learning than younger people.

## **ENVIRONMENTAL AWARENESS TEACHING METHODS**

In certain situations, the environmental worker will be dealing with one person at a time - thus

1. INDIVIDUAL method, the environmental worker may have to deal with group of people requiring
2. GROUP METHODS and sometimes he may need to relate to large number of people within a short time by means of
3. MASS — MEDIA.

### **Individual method**

This is a one-to-one type of interaction. The purposes are:

1. Giving information directly to the individual who needs it.
2. Adjusting general recommendation to fit individual concerned.
3. Creating interest in environmental problems with the individuals.
4. Obtaining information from the individuals about his peculiar situation.

### **Advantages**

1. The educator gains first—hand knowledge of actual problems of the environment from individual view point.
2. Confidence is developed between the environmental worker and the individual whose environmental problem is being appreciated.

### **Disadvantages**

1. It is time consuming and expensive

2. Individual visit may lead to loss of contact with the rest of the community.

### **Group Methods**

The purposes include:

1. To give and receive information about a problem
2. To encourage, advise and train leaders.
3. To create awareness and interest in an environmental problem facing the community and to focus attention on how to solve it.
4. Enhance change of attitude of the public about mitigating efforts in reducing and solving the environmental issues.

### **Advantages**

1. Group method is to overcome the defect of individual methods in terms of time and effort.
2. Group decisions usually carry more weight than individuals decision: An individual may be unwilling to co-operate with a programme but the group may see the programme to be to their advantage and jointly support it.
3. There is also general satisfaction by members of the group that they are all doing the same (type of ) things
4. Group methods also enhance cross-fertilization of ideas and experience and lead to resolution of common problems.

### **LIMITATION**

1. It may take longer time to persuade a group of people to come to a decision. Hence, individual may be met separately. Group teaching cannot be related to actual problems and situation affecting individual members of a group.
2. It may not be easy to get them together when you need them.

### **MASS METHOD**

Mass media in which there is no direct personal contact with audience can also be used to maximise the effectiveness of their awareness of environmental problems. Newspaper, radio, publication, videotapes, posters, exhibitions all help to carry information to many more people that can be reached by individual and group methods. The people may be convinced when an environmental educator comes around, but may soon forget the message, but the posters, radio, jingles, etc. will keep on reminding them.

## **TYPES OF MASS MEDIA**

### **1. AUDIO VISUAL AIDS**

People learn through all their senses:

What they see

- See - Hear

When more than one sense is used, learning is increased.

Research has indicated that

People remember

10% of what they hear

50% of what hear and see

90% of what they see hear and do.

Audio visual aids are tools used to make teaching more effective. They do not however replace personal contact. Audio visual are generally any device utilizing the senses of sight and hearing intended to improve comprehension and communication

Audio visual have contributed to teaching learning process in the following ways:

1. They supply a concrete assess for conceptual thinking thus of stimulating understanding.
2. They provide a high degree of interest on the receiver.
3. They help to make learning personal
4. They help to develop continuity of thought especially with motion pictures.
5. They provide experience not easily obtainable through other materials.

**CONE OF EXPERIENCE:** Cone of experience shows a range of hearing experience due to various hearing aids.

1. **Verbal:** Through talking, cassette tape, radio.

2. **Visual:** Television, Video tape

3. **Exhibition:** actual materials, plates:

4. **Demonstration:** Field trips to demonstrate the method or see a practical situation to the field.

#### **TYPES OF VISUALS**

1. **Presentation visuals:** These are used to reinforce or clarify a speaker's message e.g.

(a) Real object:

(b) Samples and Specimen: These are real objects treated and mounted in special ways e.g. contaminated item to show effects of contaminants

(c) Models: These are replicas of real, object but smaller than the real object

(d) Photographs: Each photography should tell a story, illustrates the point show the main subject predominantly and where possible have local or human interest People will be interested if they can identify the real problem, location and actual people involved.

(e) Blackboard (Chart board):

- To summarise talk
- Draw pictures and diagrams
- To write out directions to audience
- To develop lecture point by point /

- As an aid in answering question.

## 2. **Display Visuals**

- Posters
- Wall charts
- Bulletin board.

## 3. **Extension or Environmental literature**

- Bulletins . .
- Leaflets
- Handouts

## 4. **Projected Visuals**

- Colour slides
- Film strips
- Cinema films
- Tape recorders
- Puppets
- Other forms of mass media

## **2. CIRCULAR LETTERS:**

These serve to publicise an activity or a situation and to give timely information on impending situation.

They may be used as follow up to earlier points at meetings and may give a summary of points reached at meetings. It is an effective means of reinforcing personal contact and other mass media methods.

## **3. NEWSPAPER STORIES:**

1. To create awareness and interest in the environment.
2. To increase people's knowledge of the subject matter problems.
3. To give advice or warning

Newspaper stories can reach many people who might not otherwise be present during previous meetings or have no previous knowledge of the subject matter. It is an un-experience means of communication as no direct contact is needed with the audience. It also reinforces other mass-media



methods. The effectiveness is limited because ordinary people who are meant to be reached may be illiterate or unable to have access to the newspaper.

The publication of such story will depend on the editorial policy of the newspapers and the interest of the editor. Another construct is the probable lack of space. More income generating commercial articles are likely to have more priority.

#### **4. RADIO:**

This also serves to complement other mass media. This is especially important in rural communities. Even where there is no electricity. There are battery operated radios in all part of Nigeria. The major advantage being that the audience need not be literate. The environmental awareness messages being in local languages will reach wider audience. Moreover, it does not rely on the audience at meeting before broadcasting.

#### **5. TELEVISIONS**

The advantage of television is that the audience can hear and see The combination of the two senses enhances message assimilation. However, it has lesser audience than radio because of its dependence on electricity which is not available in most villages and the cost of owning the television set.

#### **6. EXHIBITS:**

Exhibit displayed at major occasion enhances appreciation of the problem by the audience who may not in the first instance be familiar with the problem.

#### **7. POSTER:**

It is very important to visually let the people know what is happening in other places and consequences of their actions on the environment.

### **SOCIAL ISSUES OF IMPORTANCE IN ENVIRONMENTAL AWARENESS**

1. Community Stratification: Each community is differentiated into social strata based on indicators such as wealth, authority or influence, occupation, education, gender, age, ethnic, origin, religion etc. The indicators of greater significance vary from one location to another based on socio-cultural background. Stratification and land tenure systems of a locality are important for the understanding of

natural resources because they allocate rights and obligation for their use by community member. The society differentiates between those who have control over natural resources and who have temporary access.

**2. Population Dynamics:** Population characteristics are of great significance to the use and management of natural resources in a locality. There is a clear relationship between population pressure and environmental degradation. As population density increases, greater competition for land and natural resources occurs.

**3. Indigenous Knowledge Systems:** Rural dwellers should not be considered to be without ideas regarding their environment. The traditional methods of managing the environment may be necessary to develop improved methods. While local knowledge is usually culturally, economically and ecologically suitable many scientific techniques are applicable to the rural environment.

**4. Gender Issue:** This is an important factor in natural resources utilization while women are wood gatherers in some parts of the country, men are responsible for fetching firewood in another parts. As such any attempt to solve such issue as deforestation due to firewood extraction without gender consideration, division of labour may meet with failure. The same situation is applicable to other natural resources e.g. - farming system, timber extraction. etc.

**5. The roles of NGO (Non-Governmental Organization):**

- (a) Nigerian Conservation Foundation
- (b) Nigerian Environmental study/Action team (NEST)
- (c) Better-life programmes

The concern of a and b are to increase public awareness and assist policy formulation and implementation. Other NGOs may be helpful in conserving the environment

**6 Motivation for local participation in resources development Strategies.** Rational human beings will consider the benefits from their action in relation to time, energy and resources necessary before deciding to take action. This problem can be avoided if local people consider themselves as partners in developmental strategies. Their cooperation is necessary to solve environmental problems which are even to their benefits.

## **FACTORS THAT PROMOTE CHANGE**

1. Number of innovators
2. Contact with other cultures
3. Communication
4. Television, radio and newspapers
5. Education of youths
6. Political and economic factor
7. Availability of extension and other rural development organisations

## **BARRIERS TO CHANGE**

### **1. Cultural barriers**

- Cultures based barriers
- Pride and dignity
- Relative value
- Unforeseen difficulties

### **2. Social barriers**

- Responsibility of individuals
- Ability or otherwise to evade taxes
- Social structure
- Communication problems

### **3. Psychological barriers**