COURSE GUIDE

EMT 405

ENVIRONMENTAL EDUCATION AND AWARENESS

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UNIT 1: POPULATION AND ENVIRONMENT

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1.0 Introduction

According to the United Nation, the world population is estimated to reach 8 billion in 2023, and projected to hit 10 billion in 2057. The present population has already passed what is termed as the “comfortable” carrying capacity of the planet. It's a common sense that as the world population continues to grow, the limits of essential global resources such as potable water, fertile land, forests and fisheries will become more stressed. This unit will discuss the relationship between population and the already stressed environment.

2.0 Objectives

By the end of this unit, you will be able to:

- explain the relationship between population and environment

- discuss the impact of population growth on environment
- explain the relationship between population and sustainable use of the environment.

3.0 Main Content

3.1 Population and Environment – A Brief Tour

Humans have sought to understand the relationship between population and the environment since the earliest times but it was Thomas Malthus' "Essay on the Principle of Population" in 1798 that is credited with launching the study of population and environmental resources as a scientific topic of inquiry. Malthus' famous proposition was that population numbers tend to grow exponentially while food production grows arithmetically. In 1968, Paul Ehrlich published The Population Bomb, which focused public attention on the issue of population growth, food production, and the environment. By 1972, the Club of Rome had published its World Model, which represented the first computer-based population-environment modelling, predicting an "overshoot" of global carrying capacity within the next 100 years. With the use of overlay of graphs depicting global trends in population, energy consumption, carbon dioxide (CO_2) emissions, nitrogen (N_2), or land area deforested has often been used to demonstrate the impact that population has on the environment. Over the years the question that the academia have sought to answer a more complex set of questions, which include among others, how do specific population changes (in density, composition, numbers or behaviour) relate to and influence specific changes in the environment such as deforestation, climate change, or the concentrations of pollutants in air and water. How do environmental conditions and changes, in turn, affect the population? How do intervening variables, such as the cultural and social environment mediate these relationships? And what is the nature of the spatio-temporal variations of the relationships? They were able to answer some of these questions using techniques such as geographic information systems, remote sensing, computer-based models, and statistical methods and with evolving theories on human-environment relationships (Natl Acad Sci. 1963).

3.2 Global Trends in Population and Consumption

Whenever a mention of population-environment relationship is made, population and consumption are the most important indicators, hence it is important that we understand the nature of global trend in population and consumption.

The future size of world population is always projected on the basis of assumed trends in fertility and mortality. Current world population stands at 6.7 billion people. The 2006 revision of the United Nations World Population Prospects presents a medium variant projection by 2050 of 9.2 billion people and still growing, although at a significantly reduced rate. All of the projected growth is expected to occur in the

developing world (increasing from 5.4 to 7.9 billion), whereas the developed world is expected to remain unchanged at 1.2 billion. Africa, which has the fastest growing population of the continents, is projected to more than double the number of its inhabitants in the next 43 years, from 965 million to approximately 2 billion. Globally, fertility is assumed to decline to 2.02 births per woman by 2050. It is population momentum arising from a young age structure that will cause global population to continue to grow beyond 2050. Finally, the impact of the HIV/AIDS epidemic on future mortality is assumed to attenuate somewhat on the basis of recent declines in prevalence in some countries, increasing antiretroviral drug therapy, and government commitments made under the Millennium Declaration (UN, 2000).

Consumption trends are somewhat more difficult to predict because they depend more heavily than population projections on global economic conditions, efforts to pursue sustainable development, and potential feedbacks from the environmental systems upon which the global economy depends for resources and sinks. Nevertheless, several indicators of consumption have grown at rates well above population growth in the past century: Global GDP is 20 times higher than it was in 1900, having grown at a rate of 2.7% per annum, CO2 emissions have grown at an annual rate of 3.5% since 1900, reaching an all-time high of 100 million metric tons of carbon in 2001 and the ecological footprint, a composite measure of consumption measured in hectares of biologically productive land, grew from 4.5 to 14.1 billion hectares between 1961 and 2003, and it is now 25% more than Earth's "bio capacity" . In the case of CO2 emissions and footprints, the per capita impacts of high-income countries are currently 6 to 10 times higher than those in low-income countries. As far as the future is concerned, barring major policy changes or economic downturns, there is no reason to suspect that consumption trends will change significantly in the near term. Long-term projections suggest that economic growth rates will decline past 2050 owing to declining population growth, saturation of consumption, and slower technological change (UN, 2000).

3.3 Population-Environment Interactions

Clark (1995), argued, that Population-environment interactions are better discussed under these sub heading land-cover change, agricultural land degradation, water resource management, coastal management, and energy and climate change.

3.3.1 Land Cover Change and Deforestation

The conversion of natural lands to croplands, pastures, urban areas and other anthropogenic landscapes represents the most visible form of human impact on the environment. Today, roughly 40% of Earth's land surface is under agriculture, and 85% has some level of anthropogenic influence. Although the world's population is now 50% urban, urban areas occupy less than three percent of Earth's surface. We can conclude from this that large-scale land-cover change is largely a rural phenomenon (Berkes and Folkes, 1998).

As regards the demographic and development transitions, the world remains divided in various stages of the land-use transition. The developed nations are urbanized and have economies dominated by service and technology industries while the developing nations

continue to experience rapid population growth, remain largely rural, and have labour forces concentrated in the primary sector (agriculture and mining industries).

Today, most land conversion from natural states to human uses is occurring in the developing world, particularly in the tropics through forest conversion to agricultural lands. One exception is the Russian Far East, which is one of the few developed world regions with high rates of primary forest deforestation mostly for logging and not for agricultural lands. Demographic variables are linked at different scales to this phenomenon. However, there is disagreement on the impact of population versus other factors, with some studies suggesting that demographic dynamics contribute more than any other process to deforestation while others suggesting the superiority of economic factors.

Geist & Lambin (2003), meta-analysis of 152 case studies of tropical deforestation suggests that, although most cases of deforestation are driven at least partially by population growth, population factors almost always operate in connection with political, economic, and ecological processes and the relative impact of each factor varies. In much of the developing world fertility rates are at the increase especially in the villages but declined so rapidly as in urban areas. The regions of highest fertility also coincide with the most remotely settled lands where the agricultural frontier continues to advance, areas that are both biodiverse and ecologically fragile. This high fertility and associated rapid population growth directly contributes to land conversion in these forested areas. In such regions, children constitute an asset to farm families that are often short of labour. Positive correlations between fertility and deforestation have been found in studies in Central and South America.

The settlement life cycle of farm homesteads also helps to explain when and where forest clearing will occur. Immediately following settlement, deforestation is high as land is cleared for subsistence crops. An increase scale in deforestation may occur as farms move from subsistence to market-oriented crops or expand into livestock rearing.

3.3.2 Agricultural Land Degradation or Improvement

Land-cover change research also considers changes in the quality of land resources as a result of human uses. The most debatable issue in population-environment interaction concerns the relationship between increasing population density in subsistence agricultural and land degradation or improvement. This is as a result of widely differing estimates regarding the extent of land degradation, with global estimates ranging from 20 to 51 million km2. On agricultural land degradation, there exist arguments and evidence as marshalled by two major schools of thought, the vicious circle proponents who believe that increasing population density in the context of high poverty almost inevitably leads to land degradation and the Boserupians who suggest that increasing density leads to intensification of agricultural systems such that yields per unit area (and per capita) are increased.

In the vicious circle in its simplest form suggested that, the model describes the following causal connections. Poverty leads to high fertility through mechanisms such as a demand for farm labour. High fertility contributes to population growth, which further increases demands for food and resources from an essentially static resource, the

declining per capita resource base reinforces poverty through soil fertility loss, declining yields, and poor environmental sanitation and poverty, in turn, contributes to land degradation by increasing incentives for short-term exploitation and because poor farmers lack access to costly fertilizers and other technologies. The implication of these reinforcing linkages is that, absent intervention, the circle will continue and soil fertility will decline until the land is no longer suitable for crops or pasture.

Panayotou (1994), have suggested that children are valued by rural households, in part, because they transform resources (forests, fisheries, and rangeland) into household income. Household-level responses to resource scarcity can lead to problems at the societal level as each household copes with increased risk and uncertainty by maximizing its number of surviving children.

The Boserupian or intensification hypothesis has been tested in a number of studies spanning Africa, Asia, and Latin America. A frequently cited study by Tiffen et al. 1996 examined changes in population density and agricultural productivity in Machakos District, Kenya. From 1930 to 1990, the population of Machakos District grew six fold, from 240,000 to 1.4 million people, with a 1990 population density of 654/km^2. The region is mountainous and semiarid (<500 mm rainfall a year), and in the 1930s, it was suffering already from soil erosion (mass wasting and gullies). The region was also isolated from national markets, and there were colonial restrictions on access to certain lands and crops. In the 1950s and 1960s, a new form of terracing was propagated by local work groups, agricultural systems shifted from livestock to intensive farming with emphasis on higher-value crops, feeder roads were built to market towns, and market towns developed with agricultural processing facilities and other small industries. By 1990, the value of agricultural production had doubled on a per capita basis. Many factors led to a positive outcome for this region, including infrastructure development, market growth, private investment, increasing management capacity and skills, self-help groups, food relief during drought, and secure land tenure. This study confirms the basic Boserupian hypothesis: increased food demand, a denser network of social and market interactions, labour-intensive agriculture and economies of scale helped to avert a Malthusian crisis.

Mortimore (2005), also found similar scenario in three dry land areas of West Africa: Kano State in northern Nigeria, the Diourbel Region of Senegal, and the Maradi Department, Niger. Outcomes were assessed in improved ecosystem management, land investments, productivity, and personal income. The author researcher found some common ingredients that resulted in improved or stable soil fertility and yields despite rapid population growth and high densities. These include markets for agricultural produce, physical infrastructure, producer associations, knowledge management, and incentives for investment and income diversification. He concludes that productivity responds to economic incentives and that the capacity of resource-poor farmers to invest in on-farm improvements should not be under rated.

These case studies bring out clearly that, population is but one among many factors that influence degradation or intensification. Other variables that are of crucial significance include institutional factors (land tenure system, local governance, accessibility to resources), market linkages (road network, crop prices), social conditions (education, inequality of landholding), and the biophysical environment itself (original soil quality,

slopes, climatic conditions). Hence, it would appear that population growth is neither a necessary nor sufficient condition for either declines or improvements in agricultural productivity to occur. Population growth can either operate as a negative factor, increasing pressure on limited arable land, or a positive factor, helping to induce intensification through adoption of improved technologies and higher labour. Where it does which depends on factors in the economic and institutional systems, Mortimore (1994).

Population can be discounted as the only relevant variable; there is little doubt that rapid population growth in poor rural areas with fragile environments can be a complicating factor in the pursuit of sustainable land use, especially because policies and markets are rarely aligned in such a way as to produce the most favourable results.

3.3.3 Abstraction and Pollution of Water Resources

The water cycle ties together life processes and aquatic organism. Ecosystems are linked and maintained by water, it drives plant growth, it is habitat to aquatic species and it is a major pathway of sediment, nutrient, and pollutant transportation in global biogeochemical cycles. Yet there are clear relationships between population and freshwater abstraction for agricultural, domestic, and industrial uses, as well as emission of pollutants into water bodies (Dasgupta 2000).

Human settlement is heavily predicated upon the availability of water. A map of global population distributions closely tracks annual rainwater runoff, with lower densities in the most arid regions and as well as the most water abundant, such as the Amazon, Congo basin and along river vallies. Whereas the former areas are water constrained for agriculture, in the latter areas, year-round rainfall in excess of 2000 mm has rendered these environments less favourable for agriculture (owing to soil leaching and oxidation) and more favourable for human and livestock diseases.

De Shabini (1998) argued that at the global scale, irrigation water for agriculture is the biggest single user (about 70% of water use), followed by industry (23%) and domestic uses (8%). As demand for food increases with growing populations and changing needs (including growing demand for animal versus vegetable protein with its far greater demands for water), it is expected that water diversions for agriculture will only increase. Today, humanity is estimated to use 26% of terrestrial evapotranspiration and 54% of accessible runoff, (Postel et. Al., 1996) Falkenmark & Widstrand (1992), established benchmarks for water stress of between 1000 and 1700 m3 per person, water scarcity of between 500 and 1000 m^3 per person, and absolute scarcity of less than 500 m^3 per person. Northern and southern Africa and the Middle East already suffer absolute scarcity. As population grows and water resources remain more or less constant, many countries in the rest of Africa are projected to fall below 1000 m^3 per person (Engleman and Leroy 1998)

Other studies at the local level reveal a similarly complicated picture. Research in the Mwanza region of western Tanzania finds that accessible runoff varies significantly across a relatively small area and that population density closely tracks available water (Zaba & Madulu 1998). Migrants to towns were generally less likely to have access to water from standpipes and more likely to rely on unimproved wells. Rural-urban

migration is not correlated to relative water scarcity in places of origin but rather to proximity to roads and to towns. The researchers conclude that high fertility a traditional adaptation to peak labour demands during the short cropping season increases the problems of water access and supply maintenance in agricultural and domestic spheres.

In the Pangani Basin of north-eastern Tanzania, a complex set of factors is leading to water conflicts, Population is one factor, owing to high fertility and migration, rural population is doubling every 20 years, and the population of towns is doubling every 10 years. But other factors include water extraction and land alienation for export flower production and protected areas, growth and mobility of livestock herds, declining summer runoff from glaciers on Mount Kilimanjaro owing to global warming, and hydroelectricity generation. The greatest conflict is between farmers and pastoralists, as farmers progressively moved into areas previously considered too marginal for agriculture and pastoralists were squeezed by restrictions on grazing areas owing to newly established protected areas. In recent years, the pressure on land has led to stresses on water and other resources, leading to heavy out-migration from the basin (Mboline, 2005).

3.3.4 Coastal and Marine Environments

From the earliest times, the areas of important global economic activity has been concentrated in the coastal zone (Sachs et. al 2000), with settlements often growing on the continental margins to take advantage of overseas trade and easy access to the resources of the rural hinterlands. As a result, the coastal zone has attracted large and growing populations, with much of their growth attributable to migration rather than natural increase (Henrichsen, 1998).

Today, 10% of the world's population lives at less than 10 m above sea level (even though this area only accounts for 2.2% of the world's land area), and coastal zones have higher population densities than any other ecologically delineated zone in the world. Coastal and marine environments are very important for human health and well-being, and they are also quite vulnerable to anthropogenic impacts (McGranahan, 2007).

Not surprisingly, over half of the world's coastlines are at significant risk from development-related activities (Faye et. al., 2004), and the potential (and realized) environmental damage is substantial. Population growth is often named as the driver of coastal and marine environmental challenges, whereas proximate causes can be traced to specific practices (Bryant et al 1998). Population growth can lead to many other coastal and marine environmental disturbances e.g. tropical mangroves are being cleared for fish and shrimp aquaculture farms, which undermine coastal protection and decreases natural habitat that many fish species use for reproduction. Expanding coastal cities undermine natural protection from storms and hurricanes and also increase pollution and runoff. Additionally, untreated sewage and agricultural runoff continue to be a worldwide problem. Although listed as a driver, like other issues, the impact of population size and growth depends on many other factors such as the sensitivity of coastal systems to stress, local habits, and markets. For example, demand for shrimp is the ultimate driver of mangrove loss, and sewage treatment systems and no-till agriculture could significantly reduce nutrient loading in coastal areas (Faye et al 2004).

The relationship between human activities and environmental impacts are hard to assess and regulate in coastal and marine environments because the environmental resources are almost always governed by Common Property Resource (CPR) management systems typical of developing countries, whereas terrestrial environments are generally managed by the government or private sectors. CPR management systems may be especially vulnerable to disruption caused by in-migration, urbanization and increase in population. However, the social and economic context largely determine whether in-migration and population pressure disrupt the CPR system and thus cause environmental degradation (Curran 2002).

Studies in developing countries on population increase and the marine environment have focused on a mediating approach, such as how technology, local knowledge, social institutions of kinship or marriage and markets mediate the role of population in resource extraction and consequent environmental degradation or enhancement. In another study in the Solomon Islands contests the notion that sea tenure regimes are weakened by in-migration and population growth. Potentially negative impacts of population pressure on the environment are diminished significantly with greater reciprocal consequences among close kin or neighbours (Aswani 2002).

Human impacts on coastal and marine environments are not a simple function of population size or density, other factors such as technology, knowledge, social activities, common property systems, migration, and the economic and ecological context in which these interactions take place all play an important role in population and environment relationships, especially in developing countries. Nonetheless, coastal and marine environments continue to be among the most threatened ecosystems in the world, owing in part to the sheer scale of detrimental human activities associated with urbanization along the coasts, continued population growth, and a growing number of tourists in search of coastal amenities and beauty (Aswani 2002).

3.3.5 Energy, Air Pollution, and Climate Change

Although a large number of the inhabitants are connected to the electric grid, some two billion poor people in the developing world still largely rely on biomass to meet their energy needs. That leaves approximately 4.7 billion people with more energy-intensive lifestyles who consume, with little help from the world's poorest, the energy equivalent of 77 trillion barrels of oil a year (Energy Information Annual 2004). More than 80% of global energy consumption is derived from fossil fuels (IEA 2006), and it is this dependence on fossil energy that is responsible for the release of the greenhouse gases and other pollutants that are altering atmospheric composition and processes on a global scale. Despite the global concerns over the health impacts of urban air quality and the potential adverse effects of climate change, population-environment researchers have paid particular attention to understanding the demographic drivers of energy consumption. Although it is clear that there are vast differences in consumption levels (per capita energy consumption in the United States is 48 times what it is in Bangladesh and 4.7 times the world average), it would be wrong to suggest that population variables are not a contributing factor.

Selden et al. (1999), analysed the reduction of U.S. major air pollution emissions from 1970 to 1990 and found that changes in economic scale, economic composition, energy,

energy intensity, and emissions intensity all played important roles. In quantifying the impacts of population on air pollution, researchers have reached different conclusions depending on which pollutants are under study, in which locations, at what scale, and for which time periods. For instance, a study of California shows that population size significantly contributes to the increase of the reactive organic gases NOx and CO and has little impact on PM^{10} and SOx, which are derived more from production activities (Cramer, 1998). Population size shows no significant relation to ground-level ozone because ozone is very difficult to measure at specific sites owing to its nature as a diffuse secondary pollutant (Cramer and Cheney, 2000). In research using national-level data, researchers found an almost linear positive correlation between population size and CO2 emissions (Cole and Neumayer, 2004).

The same inconsistencies in the relationship between population size and emissions of various pollutants are in evidence when examining other population-related variables. Cramer (1998) in his study of California counties and Cole and Neumayer (2004) in their cross-national studies found that other variables such as the percent of population that are migrants, age composition, household size, and level of urbanization have the same basic relationship as overall population size on emission levels of each of the pollutants they studied. However, caution should be used in interpreting these results because the studies only cover short time periods (10 to 20 years) in which there were only small changes in the demographic variables.

As a result of the complexity of population interactions as well as political issues, population issues were not considered in formulation of the Kyoto Protocol (Mayerson, 1998) and have also been largely excluded from the Intergovernmental Panel on Climate Change (IPCC) assessment reports (Bongaarts, O'Neill and Graffin, 1997). Although the 1996 scenarios continue to serve as a primary basis for assessing future climate change and possible response strategies, the Fourth Assessment Report of the IPCC is based on slightly lower population projections than the Third Assessment Report under the A2 scenario, which describes an economically divided world with slow technological advancement and high population growth. Consideration of demographic factors beyond population size, such as changes in age structure, urbanization, and living arrangements, which as discussed above are important in modelling future energy use, are not accounted in the SRES population assumptions. Making progress in this area requires a better understanding of the scope for future demographic change as well as methods for including demographic heterogeneity within energy-economic growth models used for emissions scenario development (Mayerson 1998).

Responsible Environmental Uses (Sustainable Development)

Responsible environment uses better known as sustainable development as defined by WCED (1987), as an approach which seeks to reconcile human needs and capacity of the environment to cope with the consequence of economic, social and cultural systems of the environment, a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and the institutional change are all in harmony and enhance both current and future potential to meet human needs and aspiration. According to BNRCC (2011), for development to be sustainable, it must promote equity within and between generations as well as within

and between nations. It concerned with improving the living standard of the poor and disadvantaged and it is applicable to all geographical scales. Sustainable development is essentially about the provision of basic needs for all in a form that ecologically and culturally acceptable.

The solutions to environmental degradation are sustainable development, which means wealth creation based on renewability and replenishment rather than exploitation. Experts are of the opinion that it is the integration of environmental considerations in technological and indeed all development planning processes in to development.

Sustainable development is all about the provision basic needs for all in a form that is ecologically and culturally acceptable. The concept of sustainable development has been continuously modified over the years since 1987 when it was initially publicized by the world conservation union in its world conservation strategy in 1980 and the 1992 Rio earth summit. Conventional interpretations varied widely with the view taking meanings which are based on different context

The European Union science Hub (2018), report presents six steps needed in order to achieve a sustainable environment in manageable way base on societal inclusion and human capacity, consumption and production, decarbonisation and digital revolution.

Fig. 1. Summary of the Role of Human in Achieving a Sustainable Environment: Adapted from the European Union Science Hub retrieved June, 2020

Sustainable development is a societal rather than an environmental challenge, therefore a substantial advances in human capacity are needed through improve education and awareness, health care and economic development, responsible consumption and production, decarbonisation and sustainable energy consumption, nutritional food and

clean water, smart cities with decent housing and inter connectivity as well as digital revolution.

4.0 Conclusion

The understanding of the relationship between population and environment will elucidate the need for man to adopt sustainable approach in exploiting its resources in order to avoid the unpleasant consequences and preserve it for generations to come.

5.0 Summary

In this unit we have learnt that:

i. The global trends in population growth and resource consumption;
ii. The relationship between population and environment; and
iii. The importance of sustainable use of the environment.

6.0 Tutor-Marked Assignments

1. Appraise the influence of population growth on environment.
2. In what ways is the knowledge of population and environment relationship is important in sustainable development?

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UNIT 2: ROLE OF EDUCATIONAL INTERVENTION IN ENVIRONMENTAL ACTION

CONTENTS

ROLE OF EDUCATIONAL INTERVENTION IN ENVIRONMENTAL ACTION

1.0 Introduction

Environmental education is a process that allows individuals to explore environmental issues, engage in problem solving, and take action to improve the environment. As a

result, individuals develop a deeper understanding of environmental issues and have the skills to make informed and responsible decisions. This unit will discuss how educational intervention can help improve environmental action.

2.0 Objectives

By the end of this unit, you will be able to:

- define what is environmental education;
- discuss the process of educational intervention in environmental action; and
- mention the role of educational intervention in environmental action.

3.0 Main Content

3.1 Importance of Educational Intervention in Environmental Action

Environmental protection, ending poverty and hunger are the main themes of the United Nations2030 Sustainable Development Goals (UN-SDGs), yet a poor education and low level of human capital are often seen as an underlying reason for poverty in developing countries (Easterly, 2005). Degesys (2008), claims that educational system can sustain inter and intra ethnic conflicts, environmental degradation, resources depletion and food insecurity. Therefore providing developing countries with educational resources so that they can transform into fully functioning and completive economic and social communities could be seen as a key issue for realizing the United Nations Millennium goals

Education can be defined as a process of socialization, enculturation and transmission of what is worthwhile to those who are committed to it, either children or adults. It is described as a family of morally legitimate procedures which aim to develop intrinsically worthwhile state of mind with wide range of cognitive content (Richard, 2013). Education is commonly referred to as the process of learning and obtaining knowledge in the form of formal education. However, the process of education does not start when a child first attends school, it begins at home. One cannot only acquire knowledge from a teacher; one can learn and receive knowledge from parents, members of family and even acquaintances (Kurt, 2016).

It is often said that education is the bedrock of every society and if a society wants to develop, it should develop its educational sector first. This is because education is very important to every society (Igbaji, 2016). In our culture today, there is huge emphasis on education especially higher education. It is believed that the more educated one is the better he is to himself and the society. Every society has specialized individuals who fulfil certain positions. They include doctors, lawyers, engineers and these positions require education. All professions require some form of higher education and at each stage, knowledge gained is used for making the society better (Durodala and Olude, 2005).

Quality education is crucial to the economic development and social stability of a nation as it helps develop crucial humanitarian values like equality, tolerance and peace. These values lead to sustainable national development, environmental protection and improved family health along with responsible participation democratic, social and political process (Igbaji, 2016).

3.2 Environmental Education

The current concern about the environment is not just for the present, but for the entire mankind now existing and the generations to follow. There has been sudden increase in the activities for Environmental Education since the 1992 Earth Summit in Brazil. This has resulted in the development of several activities and literature both at international and sub-national levels. The purpose is to regenerate man's interest in preservation, conservation and improvement of the environment before it is too late and reaches the point of no return.

Environmental education is a process to promote the awareness and understanding of the environment, its relationship with man and his activities. It is also aimed at developing responsible actions necessary for preservation, conservation and improvement of the environment and its components.

3.2.1 The Concept of Environmental Education

Environmental education is interdisciplinary, drawing from biological, sociological, anthropological, and economic political and human resources. It is also agreed that it is the process of recognising values and clarifying concept related with environment and its problems in order to develop skills and attitudes necessary to understand surroundings. It also entails practices in decision making and self-formulating a code of behaviour about issues concerning environmental quality. Environmental education can be regarded as the process of learning, through which participants acquire sufficient knowledge to contribute towards solving environmental problems. The concept of environmental education can be classified as:

3.2.1.2 Education for the Environment

Environmental education is a pragmatic response of the defacement of the environment. Environmental education is a kind of education which will seek to make pupils fully aware of the problems connected with their environment so that they will be able to tackle these problems with a sense of responsibility and with the technical skills which will enable them to contribute to their solutions along 'with other members of their community.

3.2.1.3 Education about the Environment:

Environmental Education includes conservation, outdoor and natural resource education as well as nature study but it also includes everything that relates to man and his environment. E.E. is the study of man and how he shapes his total natural and cultural surroundings for good or ill. Man, not his technology, not the physical or biological world as a separate entity, not the arts or professions operating in segregated spheres,

but all of these as they affect the quality of human life, becomes the pivotal concern. Man cannot be separated from the earth's ecosystem for he 'is the only conscious manipulator of the environment and his manipulation must be directed towards enhancing the quality of environment.

3.2.1.4 Education through the Environment

Environmental education is not a separate subject. It is a multi-disciplinary approach both to education and to the problem of environment. All the subject in the existing curriculum do have some information pertaining to environment but in their present form the subjects fail to relate to one another. Just as piecemeal attacks on environmental problems are ineffective so is piecemeal education about the environment inadequate because it does not take into account the interdependence of the pieces. It must, therefore, be of wholes not of parts, if human race is to understand the totality of environments subject areas must collaborate, integrate and coordinate so that E.E. may prove effective in overcoming the environmental crisis. The multidisciplinary approach integrates environmental education into all learning, in all subject in all grades all year long and beyond the formal school years to a lifelong education.

3.2.2 The objectives of environmental education are:

i. To help the individuals acquire on understanding of the biophysical environment and society,

ii. To encourage understanding of man as an inseparable part of his environment but with the ability of alter it in important ways through his activities or lack of it and

iii. To generate understanding of the organizational strategies and social arrangements.

3.2.3 The components of environmental education

- Awareness and sensitivity to the environment and environmental challenges
- Knowledge and understanding of the environment and environmental challenges
- Attitudes of concern for the environment and motivation to improve or maintain environmental quality
- Skills to identify and help resolve environmental challenges
- Participation in activities that lead to the resolution of environmental challenges

Environmental education does not advocate a particular viewpoint or course of action. Rather, environmental education teaches individuals how to weigh various sides of an issue through critical thinking and it enhances their own problem-solving and decision-making skills.

3.2 Educational Intervention

In accordance with the Tbilisi declaration, the ultimate objective of environmental education is for the general populace to get actively involved in trying to achieve the mitigation policies towards solving environmental problems (intergovernmental conference on environmental education 1977). In order to achieve this ultimate objective, awareness, knowledge, concern for the environment, sacrifice and special skills are paramount.

Hungerford and Volk (1990), noted that environmental educators typically assumes that when simply impact knowledge to their students' responsible actions will follow. However contemporary studies shows that the antecedents of environmental actions are much more complex than knowledge alone and the responsibility of solving these environmental problems are a holistic effort and everybody in the society has a very vital role to play since the solutions to environmental problems are multifaceted.

The role of education to every individual, groups, societies or mankind as a whole is to provide the experiences, skills, response and every necessary action needed to lead to a personal independence and social responsibilities (National Research Council, 2001). Education intervention therefore provides, Man with the necessary and required skill needed in order to be able to respond and tackle decisively any academic, cognitive, behavioural, social, cultural or environmental upsurge that tends to affect man's ability in the core areas of life. Every intervention is therefore goal oriented and aimed at skills needed to be acquires or that need to be performed more often in order to lead to a successful result (NRC, 2001). Education is widely seen as a means of eradicating both national and international problems associated with our environment, industrialization, insecurity and food insecurity.

3.3 Environmental Action

The environment forms us, deforms us and transforms us, as we form it, deform it, and transform it (Lucie Sauvé, 2005). International conferences, such as the United Nations Conference on Environment and Development (earth Summit) held in Rio de Janeiro in Brazil in 1992, have introduced the concept of the Sustainable Development and described how it could be achieved. In order to achieve the aimed action, measurable targets and goals must be set in order to be able to assess these environmental actions after a stipulated period. The Nigerian government for example, having ascend to the IPCCC Paris protocols sets in motion measurable actions in areas of its energy, as thus, renewable energy, particularly decentralization, multi-cycle power stations, scalable power stations of 20 – 50 MW, enforced energy efficiency, use of natural gas rather than liquid fuels. The oil and gas sector sets action such as improved enforcement of gas flaring restrictions, development of gas- to – power plants at gas flare sites (Micro grid), Blending 10% by volume of fuel-ethanol with gasoline (E10) and 20% volume of biodiesel with petroleum diesel (B20) for transportation fuels. Set targets and goals in the agriculture and land use includes, climate smart agriculture and stopping the use of charcoal. The Nigerian government also has action for the Industry such as benchmarking against international best practice for industrial energy usage and adoption of green technology in industry and in the transportation sector are actions such as modal shift from air to high speed rail, moving freight to rail, upgrading roads,

urban mass transit, toll roads/ roads pricing, increase use of CNG and reform petrol/diesel subsides (INDC 2017).

The idea of sustainable development gained in popularity during the mid-80s and gradually penetrated the environmental education movement and takes the responsibility of a dominant perspective. In order to respond to the recommendations enshrined in the earth Summit in 1992, UNESCO replaced its International Environmental Education Program (1975-1995) by a program entitled Educating for a Sustainable Future (UNESCO, 1997), the goal of which is to contribute to the promotion of sustainable development through massive public and private education on environmental problems. It emphasizes that economic development is at the expense of human development and that a sustainable economy is directly linked to the conservation of natural resources and the equitable sharing of resources. Educating to make rational use of today's resources is vital if there are to be enough for everyone and enough remaining to meet the needs of future generations. Environmental education then becomes one tool among others in achieving a sustainable development. Education for sustainable development would grant that the deficit information on environmental problems be mitigated at last. As early as 1992, proponents of the sustainable development ideology proposed a reform of the entire educational system for this purpose.

The function of education in sustainable development is mainly to develop human capital, encourage technical progress and facilitates the flow of trends and latest information, as well as fostering the cultural conditions favouring social and economic change. This is likely to maximize utilization of human potential and all forms of capital, ensuring rapid and more equitable economic growth while diminishing to the barest minimum environmental impacts. Empirical evidence demonstrate that general education is positively correlated with productivity and technical progress, because it enables companies to obtain and evaluate information on new technologies and economic opportunities. (Albala-Bertrand, 1992).

Environmental education for sustainable consumption is mainly concerned with promoting supply information product information concerning mode of production methods, possible environmental impacts/ mitigations on products.

3.4 The Role of Educational Intervention in Environmental Action

In 1978 the UNESCO adopts a central vision of environmental education within the framework of its environmental education programme (1975 – 1995). In line with this goal a document entitled Reshaping Education for Sustainable Development, published by UNESCO (UNESCO, 1978). The goal is to inform and help people learn about the environmental issues as well as develop skills and attitudes in solving the challenges.

Gardner and Stern (2002), argued that although private actions for the environment are important, the most effective actions are collective, when people organize to pressure the government and industries to act for the common good. Within the private sphere people should make similar strategic decisions as some choices have more impact on the environment than others.

4.0 Conclusion

In order to successfully achieve the environmental action plan, it is necessary and fundamental for the general populace to be educated and awareness must be raised through all forms of media outlets such as radio, television, social media platforms, SMS, post bills, and legislation against any negative action.

5.0 Summary

In this unit we have learnt that:

iv. The concept, components, and objectives of environmental education;
v. Environmental action; and
vi. The role of educational intervention in environmental education; and

6.0 Tutor-Marked Assignments

3. Explain the concept of environmental education
4. In what ways is educational interventions will in achieving environmental action plans?

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UNIT 3: METHODS OF DISSEMINATION OF ENVIRONMENTAL INFORMATION

CONTENTS

1.0 Introduction

Disseminating information about our environment is essential for the proper utilisation of environmental resources and its sustainability. It also needs to cover both age groups in urban and rural populations. The beneficiaries at the community level are as much a clientele for environmental information as are the policy makers, the decision makers and the project implementers. Hence, environmental information needs to be conveyed to these different categories of people through formal education systems, non-formal education systems and the use of mass media.

2.0 Objectives

By the end of this unit, you will be able to:

- explain what is environmental information;
- mention the process and methods of environmental information dissemination; and

- mention the importance of environmental information dissemination in protecting our environment.

3.0 Main Content

3.1 Environmental Information

Rapid economic development across the globe has led to a massive use of natural resources as well as a significant increase in greenhouse gas emissions which in turn has brought about noticeable environmental problems. The lack of a widespread environmental awareness on the part of those acting in various sectors (industry, public administration, users) sometimes inhibit the implementation of legislation already in existence as well as the introduction of new technologies (Walter, 2000). There is an urgent need to undertake initiatives in the environment field where environmental information may be used intelligently. This means that there needs to be sensible use of the large amount of environmental information available at sources such as the German Federal Environmental Agency in Berlin and the European Environment Agency in Copenhagen (Walter, 2000).

Environmental information is understood as everything that has to do with the rates of renewable resource harvest, pollution creation, and non-renewable resource depletion that can be continued indefinitely and if not, then they are not sustainable (Anna and Iwona, 2017). This includes climate, stability, air, land and water quality, land use and soil erosion, biodiversity (diversity of species and habitats), and ecosystem services (e.g. pollination and photosynthesis).

The dissemination of environmental information means the production, creation, collection, preparation and presentation or forwarding of such information to various target groups. These target groups refer to stakeholders, who according to (Freeman, 1984) are any group who can affect or are affected by something such as the environment or environmental information. The production of environmental information requires data collection and feedback from various stakeholders on the reports, strategy documents, and plans for environmental sustainable development that have already been published (Anna and Iwona, 2017).

Access to environmental information can help stakeholders in identifying, recognising and diagnosing a problem or opportunity; searching for and developing alternatives; and selecting alternatives and acting accordingly (Mintzberg et al., 1976). According to Anna and Iwona (2017) dissemination of environmental information has a positive effect on the decision-making of internal stakeholders.

3.2 Dissemination of Environmental Information

Although the dissemination of environmental information requires the production of such information which in turn requires the collection and analysis of environmental data (Anna and Iwona, 2017; Alister, 2000), dissemination is perhaps the most

important step in bringing environmental change. This is why most organisations focus more on disseminating their environmental research to the appropriate target groups.

3.3 Tools Used for Dissemination of Environmental Information

The two main tools used for disseminating environmental information are the internet and mass media.

Growing access to the Internet is a testimony to the rapid technical developments in the field of information technologies (IT) and the number of people they have reached (Walter, 2000). But the increased penetration of the Internet shows that new opportunities for applications are seen in a wide range of contexts (Walter, 2000). The use of the Internet as a dissemination instrument is no longer limited to commerce, travel and insurance but can be broadened to include areas such as environmental protection, which may involve not only the technicalities of processing environmental information, but also the means of effective delivery (Walter, 2000).

Ours is still a society where information spreads through personal encounter and by word of mouth. The audio-visual media have certain limitations but media provide use and views for the community leaders and opinion makers who in turn influence the beliefs and attitude of others (Durga, 2020). The environmental education in formal and adult education programmes needs to be supported by the media. For a literate population, one alternative is the print media like newspapers and magazines. The Global Environmental Change Programme of the UK Economic and Social Research Council for example, has used the media as a vehicle for research dissemination (most notably in the case of a Special Briefing on 'The Politics of GM Food').

Media aids dissemination in the following ways (Durga, 2020):

- Create awareness about environmental matters
- Enable exposure to real life situations;
- Acquaint with the conservation needs, problems and efforts; and
- Acquaint with the philosophy and practice of sustainable development.

3.4 Methods of Dissemination of Environmental Information

Once the dissemination objective and the audience are identified, there are a variety of ways to share the developed content (RHIHUB, 2011). Generally, the aim of research dissemination is to ensure that research results are used to support better environmental decision-making (John & Jennie, 2008). It is recognised that there is not one best way for communication of research, and that the approach needs to be tailored to the audience and the circumstances (John & Jennie, 2008). As such, different methods and strategies for environmental dissemination are employed by different organisations, countries and groups.

For example, The Global Environmental Change Programme of the UK Economic and Social Research Council, a large-scale, multi-year research effort used on social science perspectives on environmental problems focused on dissemination as its main task

during its final year (Alister, 2000). The methods of dissemination they employed include:

- Awareness-raising activities such as the publication of a newsletter and informational materials;
- Disseminating research briefings and summaries of specific projects;
- Synthesizing findings of several projects in topic-driven 'Special Briefings';
- Identifying the needs of 'users' in the policy and business communities;
- Providing evidence for policy efforts
- Encouraging communication and collaboration with user institutions. Efforts within the programme have explored interactive collaborations with research users.

Some methods suggested by John and Jennie, (2008) include:

- Peer reviewed publications are considered to be the appropriate channel of communication with the science community. Environmental ministries and agencies generally recognise their importance in respect of the quality assurance of the work and to build confidence in using the results.
- Professional journals are increasingly used as an effective channel of communication with practitioners. They are particularly relevant for engineers and people working in environmental management (but generally do not score so highly on measures of academic research such as impact factor, citations etc.).
- Newsletters are often used by organisations, and at the level of individual programmes, for keeping extended user and research communities up to date with developments.
- Face-to-face is considered by many interviewees communication to be the best option. A face-to-face meeting between the researcher and the user enables a proper understanding of the confidence of the conclusions and remaining uncertainties to be established. If the user has not understood something, they can ask the researcher to explain.
- Informal networks, for example with local authorities or on particular environmental issues, which may get together periodically to exchange information about what is going on.
- Regular forums, bringing together people from the research community, government and business to discuss a key issue such as climate change.
- Excursions for users to research laboratories and field sites bringing the research to life.

Durga, (2020) also highlighted some methods for environmental information dissemination as follows:

1) Information packs like posters, slides and audio-visual materials, which can be utilized by the adult education centres as well as by the workers of other developmental agencies like agricultural extension services and primary health centres.
2) Incorporation of topics in regional languages and local dialects in the primers of adult education programmes.

3) Special exhibitions in rural areas at the time of fairs and festivals

The Rural Health Information Hub also provided some methods for dissemination of environmental information especially that of public health which include:

1) Publishing program or policy briefs
2) Publishing project findings in national journals and state wide publications
3) Presenting at national conferences and meetings of professional associations
4) Presenting program results to local community groups and other local stakeholders
5) Creating and distributing program materials, such as flyers, guides, pamphlets and DVDs
6) Creating toolkits of training materials and curricula for other communities
7) Sharing information through social media or on an organization's website
8) Summarizing findings in progress reports for funders
9) Disseminating information on an organization's website
10) Discussing project activities on the local radio
11) Publishing information in the local newspaper
12) Issuing a press release

3.5 Strategies for Improving Environmental Information Dissemination

Several concrete actions are suggested for better implementation of research dissemination responsibilities by Alister, (2000). These are:

1) The need to identify and concentrate on key, short messages
2) To use simple, non-specialized and clear language
3) To target messages appropriately to different audiences.
4) Connecting with research providers
5) Identifying key audiences and needs
6) Spotting policy opportunities
7) Targeting research to key audiences
8) Counting researchers as a key audience
9) Ensuring benefits for researchers
10) Using outputs as a stepping stone to further dissemination
11) Balancing focused and general messages

Other strategies include:

1. Training courses for younger scientists and engineers who are becoming practitioners in environmental management, and more generally, teaching of undergraduates and postgraduates in universities
2. The transfer of researchers to positions in the user community, taking with them their innate knowledge of the research and helping to build mutual understanding between the research and user communities.

3.6 Target Groups of Environmental Information Dissemination

Target groups of environmental information dissemination refer to stakeholders, who according to Freeman, (1984) are any group who can affect or are affected by something such as the environment or environmental information. In some cases, the targets for dissemination are those directly responsible for decision-making, in other cases research results need to be disseminated to a wider group of actors including regulated organisations, municipalities and NGOs (John and Jennie, 2008).

Environmental awareness is essential for both young and old generation and It needs to cover both urban and rural populations. The beneficiaries at the grassroots level are as much a clientele for environmental education as are the policy makers, the decision makers and the project implementers. Hence, according to Durga (2020), environmental education needs to be conveyed to these different categories of people;

1) Among students through Education
2) Among general population through various media
3) Among functionaries and opinion leaders involved with environmental management

The following are examples of target groups for rural public health information as provided by (RHIHUB, 2011);

- State associations of county and city health officials
- State Offices of Rural Health (SORH)
- Hospital associations
- Public health associations
- Rural health associations
- Caregiver groups
- Universities and charitable foundations
- Federal agencies
- Community groups
- Faith-based organizations
- State and county extension offices
- Schools
- Local government
- Health care providers/centres

4.0 Conclusion

Disseminating environmental information is one of the fundamental requisite for protecting and conserving our fragile environment. As such, both government and non-governmental organisation should focus on providing information to the populace in order to create awareness on how tackle the current environmental issues at both local and global levels.

5.0 Summary

In this unit we have learnt that:

i. The meaning environmental information dissemination;
ii. The methods and tools of disseminating environmental information; and
iii. The strategies involved in disseminating environmental information.

6.0 Tutor-Marked Assignments

5. What do you understand by environmental information dissemination?
6. What are tools required for environmental information dissemination?
7. Discuss the strategies involved in disseminating environmental information.

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UNIT 4: METHODS OF PUBLIC OPINION ASSESSMENT

CONTENTS

1.0 Introduction

Assessment of public opinion is very vital in environmental education and awareness, this is because the aggregate of individual attitudes or beliefs held by population about their environment determines how they relate to it, and vice-versa. Considering the importance of understanding what opinion does a particular population holds about the

environment is important before educating them, this chapter will discuss the basics issues related to assessing such opinion.

2.0 Objectives

By the end of this unit, you will be able to:

- explain what is public opinion;
- mention the methods of public opinion assessment; and
- discuss some of the challenges likely to encounter in assessing public opinion.

3.0 Main Content

3.1 Public Opinion

Public opinion comprises of the wants, needs and ideas or thinking of the majority in a society. It is the aggregate assessment of the individuals of a general public or state on an issue or issues. The idea of public opinion was conceived through urbanization and other socio-political factors. People's thoughts became important as forms of political contention changed. Authority in a democratic government is derived from and driven by public opinion.

The proper scholarly study of public opinion is relatively new; however, the functional investigation of public opinion isn't new in any way. Governments have focused on general sentiment as long as there have been governments.

3.2 Methods of Public Opinion Assessment

According to Russell and Alverno, (2020) there are two types of methods that can be used to assess public opinion which are; the informal and formal methods.

3.2.1 Informal Methods

3.2.1.1 Elections

The most common way for a democratic government to learn about public opinion is through elections. They are important because they determine who staffs the government, and they are also one way for the public to express its feelings about politics. But they are not a particularly precise method for ascertaining public opinion.

With elections, it is difficult, if not impossible to attribute one or more factors to the success or failure of a candidate. And even if some factors are singled out, it is difficult to tell which is the most important. For example, a candidate may have won because he/she is a better speaker; has better advertisements; is more in touch with the people etc.

Elections are also imperfect measures of public opinion because they reflect only the opinions of those who voted.

3.2.1.2 Interests and Lobbyist Groups

It may seem unlikely that interest groups would be valid measures of public opinion. They are remarkably unrepresentative of the public as a whole. The wealthy and the educated members of society are much more likely to be organized into interest groups and employ representatives. The poor and uneducated are much less able to speak to the government through lobbyists. Nevertheless, legislators, staffers, and other government personnel do pay attention to what interest groups say because these groups tend to be well informed about their issues concerning their employers, they have access to facts necessary to write laws, they understand the political process, and they are present when necessary to answer questions.

In a study of committee staffers in the Illinois state legislature, Herbst, (1998) found that the staffers did pay a great deal of attention to lobbyists and, in fact, considered what they said to be public opinion. Herbst was very clear that the staffers did not merely consider their views to be surrogates for public opinion; they considered them to be public opinion. The staffers relied on lobbyists to be their conduit to understanding public opinion partly because they perceived them to be in touch with the people of Illinois and to honestly relay the people's opinion.

3.2.1.3 The Media

Many government officials, and many regular citizens, look to the media to understand the views of the public. In Herbst's study, she found that legislative staffers also considered the media to accurately present public opinion. Media, such as television, newspapers, and magazines are important because of the news they choose and how they portray the issues. In other terms, they are important in determining the political agenda (what people in the government are thinking about) and in framing the issues (how the issues are being considered). The print media are also important as conduits of opinions from editorialists, columnists, and ordinary people who write letters to the editor.

3.2.2 Formal Methods

Formal methods are more systematic and efficient in assessing public opinion and they are carried out by scholars who understand their appropriate use. Formal methodologies are typically classified into quantitative and qualitative approaches. Quantitative methods involve numbers and usually statistics while qualitative methods are more descriptive in nature. Most public research is conducted quantitatively, almost always by surveys.

An opinion poll, sometimes simply referred to as a "poll," is a survey of public opinion from a particular sample. Opinion polls are usually designed to represent the opinions of a population by conducting a series of questions and then extrapolating generalities in ratio or within confidence intervals.

3.3 Types of Polls

The main types of polls include: opinion, benchmark, bushfire, deliberative opinion, tracking, and the straw poll.

- An opinion poll is a survey of public opinion from a particular sample. Opinion polls are usually designed to represent the opinions of a population by asking a series of questions and then extrapolating generalities from responses in ratio or within confidence intervals.
- A benchmark poll is generally the first poll taken in a campaign. It is often taken before a candidate announces his or her bid for office, but sometimes it occurs immediately following the announcement, allowing some opportunity to raise funds. This poll is generally a short and simple survey of likely voters.
- A tracking poll is a poll repeated at intervals generally averaged over a trailing window. A weekly tracking poll uses the data from the past week and discards older data.
- The deliberative opinion poll is a form of opinion poll that incorporates the principles of deliberative democracy. In the deliberative opinion poll, a statistically representative sample of a community is gathered to discuss an issue in conditions that further deliberation. The group is then polled, and the results of the poll and the actual deliberation can be used both as a recommending force and, in certain circumstances, to replace a vote.
- A straw poll or straw vote is a poll with nonbinding results. Straw polls provide dialogue among movements within large groups. In meetings subject to rules of order, impromptu straw polls often are taken to see if there is enough support for an idea to devote more meeting time to it.

3.4 Modes of Data Collection

There are several ways of administering a survey. The choice between administration modes is influenced by: cost, coverage of target population, flexibility of asking questions, respondents' willingness to participate, and response accuracy. Different methods create mode effects that change how respondents answer. The most common modes of administration are:

- Telephone
- Mail
- Online surveys
- Personal in-home surveys
- Personal mall or street intercept surveys
- Hybrids of the above.

3.5 Survey Methodology

The most important aspects of a survey include:

- Identifying and selecting potential sample members.
- Contacting individuals and collecting data from those who are hard to reach (or reluctant to respond).
- Evaluating and testing questions.
- Selecting the mode for posing questions and collecting responses.
- Training and supervising interviewers.
- Checking data files for accuracy and internal consistency.
- Adjusting survey estimates to correct for identified errors.

3.6 Response Format

Usually, a survey consists of a number of questions the respondent answers in a set format. A distinction is made between open-ended and closed-ended questions. An open-ended question asks the respondent to formulate his or her own answer, while closed-ended questions have the respondent choose an answer from a given number of options. The response options for a closed-ended question should be exhaustive and mutually exclusive. The four types of response scales for closed-ended questions are:

- Dichotomous: The respondent has two options.
- Nominal-polytomous: The respondent has more than two unordered options.
- Ordinal-polytomous: The respondent has more than two ordered options.
- (Bounded) Continuous: The respondent is presented with a continuous scale.

3.7 Advantages of Survey

- They are relatively easy to administer.
- Can be developed in less time compared with other data-collection methods.
- Can be cost-effective.
- Few “experts” are required to develop a survey, which may well increase the reliability of the survey data.
- If conducted remotely, can reduce or obviate geographical dependence.
- Useful in describing the characteristics of a large population assuming the sampling is valid.
- Can be administered remotely via the Web, mail, e-mail, telephone, etc.

- Efficient at collecting information from a large number of respondents.
- Statistical techniques can be applied to the survey data to determine validity, reliability, and statistical significance, even when analysing multiple variables.
- Many questions can be asked about a given topic, giving considerable flexibility to the analysis.
- A wide range of information can be collected (e.g., attitudes, values, beliefs, and behaviour).
- Because they are standardized, they are relatively free from several types of errors.

3.8 The Problems with Polls

Problems with polls typically stem either from issues with the methodology that bias the sample or the responses that cause the bias.

1. **Potential for Inaccuracy:** In practice, pollsters need to balance the cost of a large sample with the reduction in sampling error. A sample size of around 500 – 1,000 is a typical compromise for political polls. Another way to reduce the margin of error is to rely on poll averages. This method is based on the assumption that the procedure and sample size is similar enough between many different polls to justify creating a polling average.

2. **Theories on Erroneous Polling Results:** A number of theories and mechanisms have been offered to explain erroneous polling results. Some of these reflect errors on the part of the pollsters; many of them are statistical in nature. Others blame the respondents for not giving candid answers (the controversial Bradley effect & Shy Tory Factor).

3. **Non-Response Bias:** Since some people do not answer calls from strangers or refuse to answer the poll, poll samples may not be representative samples from a population due to a non-response bias. Because of this selection bias, the characteristics of those who agree to be interviewed may be markedly different from those who decline. That is, the actual sample is a biased version of the universe the pollster wants to analyse.

4. **Response Bias:** Surveys may be affected by response bias, where the answers given by respondents do not reflect their true beliefs. This may be deliberately engineered by unscrupulous pollsters in order to generate a certain result or please their clients, but more often is a result of the detailed wording or ordering of questions. Respondents may deliberately try to manipulate the outcome of a poll by advocating a more extreme position than they actually hold in order to boost their side of the argument or give rapid and ill-considered answers in order to hasten the end of their questioning. Respondents may also feel under social pressure not to give an unpopular answer.

5. **Coverage Bias:** Another source of error is the use of samples that are not representative of the population as a consequence of the polling methodology. For example, telephone sampling has a built-in error because in many times and places, those with telephones have generally been richer than those without.

6. **Selection Bias:** Selection bias occurs when some units have a differing probability of selection that is unaccounted for by the researcher. For example, some households have multiple phone numbers making them more likely to be selected in a telephone survey than households with only one phone number.

4.0 Conclusion

In order to successfully achieve a sustainable environmental use, the public have to be educated about how to relate with the environment and the consequences of misusing the environment. Before this could be achieved, public opinion has to be assessed in order to understand their conceptions about the environment. This unit has provided information on how to go about assessing public opinion.

5.0 Summary

In this unit we have learnt that:

i. The methods and types of public opinion assessment;
ii. Methods of data collection and survey methodology; and
iii. The problems of polls.

6.0 Tutor-Marked Assignments

Explain the methods of assessing public opinion.
What are the advantages of survey in public opinion assessment?

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UNIT 5: SOCIAL THEORIES OF ENVIRONMENT

CONTENTS

1.0 Introduction

This discusses social theory for environmental psychology, ecological, psychology theory of participation, social response to environmental-pollution, environmental damage and compensation.

2.0 Objectives

By the end of this unit, you will be able to:

- discuss some social theories about environment;
- expain society responds to environmental issues; and
- discuss environmental damage and compensation.

3.0 Main Content

3.1 Environmental Psychology

Environmental psychology is the study of interrelationships of human mind and behaviour with the physical environment (Daniel, 2007). Environmental psychology has focused on the interrelationship between environments and human behaviour. According to Gifford (1997) individuals change the environment and their behaviour and experiences are changed by the environment. Furthermore, each individual's behaviour and experience is unique and differs from the person standing next to him/her in the same environment. These environments could be natural environments, social settings, built environments, learning environments and informational environments (Veith and Arkkelin, 1995).

Environmental psychology was not fully recognized as its own field until the late 1960s when scientists began to question the tie between human behaviour and our natural and built environments. Since its conception, the field has been committed to the development of a discipline that is both value oriented and problem oriented, prioritizing research aimed at solving complex environmental problems in the pursuit of individual well-being within a larger society (Prochasky, 1987).

Kurt Lewin (1946) research in environmental psychology integrates the scientific goals of analysing and explaining the nature of people-environment transactions with the more practical goal of enhancing and even optimizing people's relationships with their everyday environments through more effective urban planning and environmental design. According to Gifford (1997), environmental psychology is studied at three levels of analysis. The first level of analysis sorts and arranges each individual's occurrence of the environment according to perceptions, cognition and personality. The next level of analysis is the collective organization of space, which consists of four aspects namely; personal space, territory, crowding and privacy. The last level of analysis is the physical settings in which individuals find themselves every day.

3.2 Ecological Theory

Ecological theories suggest that a person and his environment co-exist. More like a symbiotic relationship. A person's behaviour exists because of the environment they are put in. Roger Barker was the major profounder of this theory. He examined the way in which the number and variety of behaviour settings remains remarkably constant even as institutions increased in size (Barker and Gump 1964).

Baker (1964) observed that there was no difference in the behaviour exhibited by students in large and small schools. Therefore a student in a small school took on many roles and a student in a large school selected the roles he or she was interested in taking. Another example exists with behaviour on the plane. Sitting on a plane is fixed for the duration of the journey due to safety reasons and one can hardly change seats or move up and down as they like, as opposed to sitting in an office or sitting in a movie theatre. If I for instance, do not like the seat given to me in the Movie Theatre or office, I can change it. I can even decide to leave.

3.3 Theory of Participation

The evolution of participation is seemingly built on trial and error with participation enjoying questionable success and at times practice represented perversion. Participation theory represents a move from the global, aspatial and top-down strategies that dominated early development initiatives to more locally sensitive methodologies (social capital Research, 2014).

Participation is not a new concept; it represents a move from the global, aspatial, top-down strategies that dominated early development initiatives to more locally sensitive methodologies (Storey 1999). There are differing opinions as to the origins of participation theory. Midgley (1986) suggested that the historical antecedents of community participation include: the legacy of western ideology, the influence of community development and the contribution of social work and community radicalism. Buchy (2000) suggested that literature on participation and participatory processes stems broadly from two major areas: political sciences and development theory.

Lane (1995) added to this view, suggesting that participation is heavily influenced by theories of development and is therefore highly varied and complex due to different theoretical positions. The dominance of the top-down approaches to development was largely a result of modernization theory which was dominant in the 1960s (Lane 1995).

3.4 Social Theory

Austin Harrington (2004) referred Social theory to ideas, arguments, hypotheses, thought-experiments and explanatory speculations about how and why human societies or elements or structures of such societies come to be formed, change, and develop over time or disappear.

Austin (2004) stressed out that Social theory can name general sources of ideas about social phenomena relevant to other disciplines of the social sciences and humanities, such as anthropology, political science, economics, history, cultural and media studies, and gender studies. And social theory can also be thought of as incorporating normative concerns bearing on debates about desirable ends or values of social life about how social life ideally "ought to be" in ways that overlap closely with concerns in the fields of moral, political, and legal philosophy.

3.5 Social Response to Environmental Pollution

Environmental pollution is the unfavourable alteration of our surroundings, wholly or largely as a by-product of man's actions, through direct or indirect effects of the changes in the energy pattern, radiation levels, and chemical and physical constitution and abundance of organisms. Environmental pollution is a global problem and is common to both developed as well as developing countries, which attracts the attention of human beings for its severe long-term consequences (Rai, 2016).

Environmental pollution is associated with adverse health effects experienced or measured in the short or long term that clinically may be described as either acute or chronic. Usually acute effects follow sudden and severe exposure and rapid absorption of the substance. On the contrary, chronic effects may not be immediately observed and follow prolonged or repeated exposures over more or less relatively long periods (Reis, 2011).

3.5.1 Types of environmental pollution

According to Rai (2016), environmental pollution maybe categorized depending on the nature of pollutants and also subsequent pollution of environmental components, viz:

- Air Pollution
- Water Pollution
- Soil/Land Pollution
- Noise Pollution
- Radioactive Pollution
- Thermal Pollution

Different societies view things differently due to culture, religion or exposure to technology. Some societal problems are unique to every society, while some are limited or specific to a particular society or region. Developed regions of the world face different environmental challenges from developing or under-developed regions. That said, handling the environmental challenges peculiar to all regions vary due to the societal norms.

China for example being the second largest producer of have taken a huge leap in curbing polluting the environment with waste by providing waste sorting equipment in over 40 major cities and also enforcing a strict law of fining non-compliant persons about $30 while businesses and institutions up to $7000.

The Niger Delta region of Nigeria has recorded several cases of the effect of pollution such as gas flaring, oil spillage in their environment due to pervasive presence and operation of oil and gas companies in the area especially Warri Refinery and Ekpan (Nduka and Orisakwe, 2009).

Obafemi et. al., (2012) assessed the public perception on the environmental pollution profile in Warri Township where respondents affirmed that air pollution is being experienced in the area as well as water and land pollution. The result of his analysis corroborated with the findings of that pollution of the environment is in different categories which can be land pollution, air pollution, noise pollution and water pollution.

Respondents in the study also revealed that there are three major sources of environmental pollution in the study area and these included improper waste disposal, oil spillage and gas flaring; and ejection of carbon monoxide into the atmosphere. Having revealed this, the community members sabotage pipelines thereby causing oil spillage and when there is corrosion they hardly report to the right authority.

It took the people of Ebubu Community of Ogoni 40 years to get judgement to be compensated for the massive oil spills that affected about 255.369 hectares of their land in 1970 (Vanguard newspaper, July 6, 2010). This is not justice in our opinion as "justice delayed is justice denied". Also, Bodo Community that got judgement against SPDC in 2011 in London court is yet to be compensated for oil spill of 2008. A study covering the period between 1981 and 1986, which showed that of 1,081 claims for compensation, only 124 claims were settled, 24 of the remaining unsettled claims went to court, others without record (Okonkwo, 2014). Because of this delay, cost and the problems with the judicial system in Nigeria, people many times are discouraged not sue and may not get compensated.

Theresa (2012) attributed poverty, overpopulation and greed, amongst others social ills, to be the major cause of degradation of the environment. Perceptions about the main contributors to air pollution were found to vary across socioeconomic groups. In Kuwait people identified air pollution to be the fifth most important consequence of traffic congestion out of eight possible consequences.

3.6 Environmental Activism

Environmental activism refers to the coming together of various groups of individuals and organizations that work in collaboration in social, scientific, political, and conservational fields with the main purpose of addressing environmental concerns. These people and organizations are collectively part of the green movement, green living, or environmental sustainability and do have a common agenda on protecting and preserving the environment. The most significant ideology these people share in terms of ideas is coming up with solutions to environmental problems.

Environmental activists have fought a David vs. Goliath battles government and multi-national corporations against non-eco-friendly practices especially in industries like mining, and manufacturing. These industries are notorious for their activities polluting the environment. It is very evident that the fight is yielding results with some

governments opting for clean sources of energy, recycling and enforcing sustainable practices in industries that have huge impacts on the environment.

3.6.1 Problems of Environmental Activism

Environmental activists have severally come head to head with multi-national corporations and governments and have come out in the losing end. Environmental activists have been detained or even killed in as in the case of Ken Saro-Wiwa. Some ecological movement become disenchanted when some of its leaders accept government posts, such as the case in Mexico where civil activism fluctuates with the presidential elections that occur every six years.

3.7 Social Response to Solid Waste Programs

Below are some examples social responses:

Ocean Clean-up: A non- profit organization aimed at intercepting plastics from rivers before reaching the seas and also cleaning the accumulated wastes in the oceans.

Trash to Cash: Jaiz Bank in partnership with Chanja Datti Ltd (an environmental cleaning company), United Nations Development Programme (UNDP), and Abuja Environmental Protection Board (AEPB) who operated "Trash to Cash Recycling Hubs Project'' in the centres. Chanja Datti Ltd. established five recyclable waste collection centres in Abuja to promote youth empowerment and environmental cleanliness.

eTrash2Cash: collect variety of wastes (plastic, paper, metals, food, glass etc) from thousands of low &middle-income earning communities and commercial hubs in Kano through scrap dealers and mobile waste managers using technology, and exchange those wastes with direct cash incentives. eTrash2Cash also makes use of all wastes collected from communities to make reusable and sustainable end products, e.g. organic compost made from food wastes for smallholder Nigerian farmers. Overall, our work helps to reduce pollution in various forms, reduces flooding in local communities, reduces deforestation and mitigates the effects of climate change (eTrash2cash, 2020).

Wecyclers: Wecyclers is determined to make recycling a popular practice in Lagos by helping people to see garbage as a valuable resource. Wecyclers runs on teamwork, using an incentive-based programme in the city's low-income areas (where municipal services often don't reach) and empowering residents to help solve Lagos's waste problem.

3.8 Environmental Damage and Compensation

The environment has been altered by humans for millennia, especially with the advent of agriculture over 10,000 years ago. Furthermore, as population continues to grow, there is more pressure placed on the environment to provide resources that will support human needs. The unique nature of environmental problems today is that they are caused more by human activities than natural phenomena (Shrinkal, 2019). Economic growth and consumerism have started to show detrimental effects on nature. Modern

technologies have the capability of causing damage that is more serious in kind, greater in scale than ever before. These damages are often irreversible and they threaten the entire world.

According to EarthPulse (2020), it is estimated that more than 80% of the Earth's surface has been directly or indirectly impacted by human activities. Considering the global nature of climate change, one might argue that human activity is affecting the entire planet, from urban to remote wild areas. When the well-being of mankind is at stake, it is generally understood that the decisions concerning damages to the environment can no longer be left to individuals (Pfennigstorf, 1979).

3.8.1 Environmental Damage Concept

The concept of environmental damage has evolved, and it is one of the aspects of development of international environmental law. The concept of environmental damage is extended courtesy of this development (Spinedi, 1991). Environmental problems have changed over time, and so is the focus on them. Environmental damage or degradation can be considered as the deterioration of the environment through depletion of resources such as air, water and soil; the destruction of the ecosystems and extinction of wildlife. Environmental damages impose costs on societies that are not reflected in market prices, need to be valued to compare the benefits of environmental protection with the costs of remedial action to make better policy decisions (Reddy, 2011).

In our world today, the major cause of environmental damage has been identified to be the rapid increase in population, and human activities have been identified to have negative and harmful effects to the environment (Larsson, 2009). Scientists have predicted that environmental quality will be lost due to irreversible damage which will affect the global landscape (Khalatbari, et. al, 2016). However, environmental damage is a complex concept, and no definition has been unanimously accepted globally. Unique definition of environmental damage will play an important role in environmental protection for states (Mitchel, 2009). Therefore, the importance of the definition will be based on states' responsibility and liability to prevent, reduce and compensate environmental damage.

Sands and Peel (2012) stated that the narrow definition of environmental damage is limited to the damage on natural resources separately. They include air, water, flora and fauna, and their interaction. Using the extensive approach however, environmental damage includes damage to the natural environment, natural resources, landscape, cultural heritage and environmental amenity. This definition captures not just the natural environment, but all aspects of human life, his cultural heritage as well as the sustainable use of natural resources. In the context of international law, environmental damage means to cause damage to more than one country or territory, with serious consequences, such as nuclear contamination, contamination of soil, water or air pollution (Springer, 1977).

Generally, damage to the environment is captured in the instruments of environmental law, including all the negative effects of man and his artefacts on the environment (Saunders, 1976). Damages that can be compensated are defined in the schemes of restitution and liability.

3.8.2 Legislation

Countries globally have signed agreements and have national laws designed to protect the environment. Apart from that, International Environmental Law which is interdisciplinary, is aimed at protecting the environment, unlike the previous agreements which were mostly unitarian (Burnett, 2015). Furthermore, the law provides numerous areas of research in ecology, economics, political science, human rights and navigation. Examples of national legislations that recognized environmental damages include the Nigerian Environmental Protection Act of 2007, the US Oil Pollution Act of 1990 (OPA), Nepal Environmental Protection Act of 1997 and so on.

In Nigeria, the body charged with protecting the environment is Federal Environmental Protection Agency (FEPA) through Decree 58 of 1988 and 59 (amended) of 1992 (NESREA, 2020), which was later merged with other agencies under the Federal Ministry of Environment. In 2007, a bill was passed by the National Assembly to establish National Environmental Standards and Regulations Enforcement Agency (NESREA), which is a parastatal under the Ministry of Environment.

3.8.3 Determination of Environmental Damage

Determination of environmental damages is carried out to quantify the damages resources or services that should be offset by remediation projects. Determination and quantification of damage might involve studies to examine the causes, nature of the damages, intensity, spatial and temporal extent. In some cases, models and existing data may suffice. However, such studies must be tailored to produce high quality data that is rigorously scientific and can answer questions related to equivalency analysis.

Environmental damage and degradation is as a result of technological, socio-economic and institutional activities. The landscape is impacted when natural resources are depleted. These resources are water, air and soil. Wildlife, plants, animals and microorganisms are also impacted. The extraction of fossil fuels represents the largest contribution to environmental damage (Vallero, 2014). According to Choudhary et al. (2015), environmental damages are based on many factors including: urbanization, population growth, economic growth, intensification of agriculture, increase in energy use and increase in transportation. They further stated that natural occurrences such as landslides, earthquakes, hurricanes, wildfires and tsunamis can cause environmental damage and upset the ecosystem.

3.8.4 Environmental Compensation

Presently, there are regional and global agreements addressing compensation in relation to environmental damage. Most of these were developed under international organizations such as the United Nations, International Maritime Organization (IMO), International Atomic Energy Agency (IAEA) and so on (UNEP, 2003). Environmental compensation is used worldwide, but remains a concept under development in many countries. The underlying idea is to maintain the overall quality of the environment in cases where environmental assets are damaged, for example, by residential or industrial development or by road construction (Persson, 2013). However, the implementation of environmental compensation principles in urban development is constrained mainly by

factors such as lack of space, and the complexity of environments that are affected (Junevičius et al., 2016).

Environmental compensation is a form of charges paid for damaging the environment; polluting nature, destruction of lands, animals and plants (World Bank, 2011). The compensation should be adequate to implement measures that will remediate, rehabilitate, reproduce and enhance the environment that has been damaged. The principle of environmental compensation is to avoid, minimize, restore or compensate the damage to the biodiversity due to human activities; however in practice it is almost impossible to achieve no net loss to the biodiversity ((Junevičius et al., 2016).

There is a lack of integrated approach towards the strategies how environmental compensation should be implemented in the planning of various projects that have impact upon biodiversity (Junevičius et al., 2016). Furthermore, there is a lack of holistic approach towards the nature in legislation and practices of environmental compensation, as usually focus of instruments is on specific parts of natural environment. Ideally, the principles of environmental compensation should be an integral part of national strategies of sustainable development.

The extent to which environment damage can be meaningfully compensated raises difficult questions of environmental values and technical expertise. Analysis at two levels – national planning policy and the negotiation of compensatory habitat creation for a specific development scheme – indicates that the pursuit of environmental compensation through present planning processes can serve to accommodate development interests (Cowell, 1997). The ‘art’ of environmental restoration has aesthetic, technical and political dimensions. It can act to reconcile environmental concerns with economic development – a purpose which increasingly connects it with political projects of sustainable development.

4.0 Conclusion

This unit presents discussion on some theories about environment, environmental activism, and examples of some social responses to environmental issues. The unit also discusses environmental damage and compensation issues.

5.0 Summary

In this unit we have learnt about:

iv. Social and ecological theories as they relates to environment;
v. Environmental activism, and examples of social responses to environmental issues; and
vi. Issues surrounding environmental damage and compensation.

6.0 Tutor-Marked Assignments

a. Explain either ecological theory or theory of participation.
b. Discuss the nature of social responses you observe in your locality.
c. What do you understand by environmental damage?

7.0 References/Further Reading

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