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THE EDITORIAL

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Notes to Contributors

Well researched articles on current issues in inter-disciplinary fields, research findings and book reviews are mostly especially welcome.

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- The manuscript should be between 14 to 18 pages double-line spacing in A4 paper, times new roman 12 point font size
- Submitted articles will be peer-reviewed
- Each article must be an original work of the author and has not been submitted to anywhere else for publication. Also, it should make significant contributions to the specific fields of interest.
- The article should be preceded by an abstract of not more than 200 words and 3-5 keywords.
- The author should ensure that there is a titled containing names (no Initials), address, institutional affiliation, e-mail address and phone number
- All tables, figures and photographs are to specially packed and camera ready
- Author should submit articles as a soft copy through electronic mail (e-mail) MS-Word attachment to thegazelle@gmail.com

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MAN-ECOSYSTEM IMBALANCE: THE CASE FOR ECOLOGICAL SUSTAINABILITY THROUGH ENVIRONMENTAL EDUCATION

By

[1]PROFESSOR AJIBADE, L.T.,[1]DR. AFOLAYAN, O.S. AND [2]DR. ABDULRAHEEM, M.O.

[1]Department of Geography and Environmental Management, Faculty of Social Sciences,

[2]Department of Urban and Regional Planning, Faculty of Environmental Sciences,

University of Ilorin, Kwara State, Nigeria

edabijalt2001@yahoo.com, 234-806-525-1963

Abstract

An ecosystem describes a distinct ecological unit that consists of both the living and non-living elements. When this is able to thrive and support itself without outside influence or assistance, it is termed sustainable ecosystem. In ideal sustainable ecosystems, everything is already provided for life to survive. Modifications to any of the ecosystem driving processes, through human activities, automatically change other processes and thereby lead to 'ecosystem imbalance' (EI) upon which this study is premised. To overcome this imbalance, certain mechanisms are required to help the ecosystem cope with changes in order to ensure its sustainability. The study identified 'Environmental Education' (EE) for the promotion of environmentally friendly life-styles, as one of such mechanisms. Achieving sustainability is not merely about a series of technical fixes, about re-designing humanity or re-engineering nature, in our continuing desire to compete in the global economy. Even the best technologies, policies, and regulations will not put society on a sustainable course without a fundamental shift in our thinking and actions, along with extensive engagement of all concerned citizens. The papers observes that if man does not control his interaction with the environment, the imbalances in the ecosystem will continue such that it will not be able to sustain itself. It is to this extent that the existing means of providing Environmental Education require a reorientation towards

sustainability at the various levels of formal, non-formal and informal education at all levels of society. This will involve the development of curriculum and enlightenprograms capable of changing people's perception of the value of the natural world and how to change their environmental behaviour. The paper concludes that this effort will create a society that is aware of, and concerned about the environment and its associated problems arising from ecosystem imbalance; and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively towards solutions of current problems and prevention of new ones.

Key words: Man, Ecosyetem, Imbalance, Sustainability,Education

Introduction

An ecosystem is a distinct ecological unit that consists of both the living and non-living elements. The term 'ecosystem' was initially coined in 1930 by Clapham, to denote the physical and biological components of an environment considered in relation to each other as unit (World Institute forConservation and Environment, 2012). Robert (1996) considered an ecosystem basically as an energy-processing and nutrient-regenerating system. The word 'ecosystem' was first used in print by Tansley in his well-known paper on vegetation concepts and terms (Rusell *et al.*, 1993 and Willis, 1997). Therefore, ecosystem represents one type of general system or group of general systems where living organisms play fundamental role and represent one of the many variables which may be characteristic of any system. Each organism has prominent positionorfunction it plays in an ecosystem.

Within an ecosystem, four inseparable fundamental ecological processes exist and these are *water cycle, mineral cycle, energy flow and community dynamics*. These are the fundamental processes that drive the system. Modification of any one of these processes automatically changes the systems because, in reality, they are only different aspects of the same thing. Deliberate or inadvertent intervention of man through series of activities disrupts normal functioning of an ecosystem. In other words, man's curious interest in

social and economic growth and development triggers ecosystem imbalance.

Ameliorating the related ecological issues caused by man-ecosystem interaction, now and in the future, to achieveecological sustainability, calls for environmental education. Ecological sustainability is referred to as capacity of ecosystem to maintain essential functions and processes, and retain their biodiversity in full measure over long-term, but because man is not conscious that his actions have serious consequences on the ecosystem, this paper identifies the need for environmental education. According to UNESCO (1978), environmental education is also a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action.

Man-Ecosystem Processes and Interrelationship

The impact of mankind can be described in ecological terms as they affect energy use and non-renewability of environmental resources beyond their formative rate. When the world's population was able to cope with the environmental resources, balance existed within the ecosystem but as a result of man'scapacity and will to dominate, control and subdue the environment, imbalances set in. Virtually all human activity on earth are believed to be initially controlled by the environment according to environmental determinism school of thought. However, socio-economic changes in relation to the growth in population made man to influence the environment in order to acquire his basic needs. This action could be seen as the genesis of the environmental imbalances because, biophysical environment is said to be self-regulated if not influenced by man's activities. The main components of this biophysical environment are water, mineral, energy flow and community dynamics.

- **Water cycle**

The constant process of precipitation, transpiration, evaporation, and surface and ground water flow is called the water cycle. Water cycle involves the circulation and transformation of water throughout

Earth's atmosphere, hydrosphere, lithosphere and biosphere (Robert, 2002). An effective water cycle requires a covered and biologically active soil. When effective, most water infiltrates in quickly where it falls. Later, it is released slowly through plants that transpire it, or through rivers, springs and aquifers that collectthrough seepage, what the plants do not take. When soil is exposed and biological activity reduced, most water runs off as floods.

The effectiveness of the water cycle and its overall function are directly influenced by land management practices. Anthropogenic alterations of stream-flows may have profound effects on ecosystem structure and function. Human influence on watershed hydrology is extensive and may be a primary cause of ecological impairment in river and stream ecosystem (Daren *et al*., 2010). In the US, natural stream flow regimes are influenced by dams and diversion structure, land-use that alters runoff to stream channels, groundwater withdrawals from contributing aquifer, and inter-basin water transfers. Due to the natural timing, magnitude, and frequency of stream-flows dictate the evolutionary adaptations of many river biota (Anthington *et al*., 2002) and control many physical and chemical processes.

- **Mineral cycle**

The mineral cycle may be referred to as the nutrient cycle which is the uptake, use, release, and storage of nutrients by plants and their environment (Susan, 2004). Nutrients follow cyclical patterns as they are used and re-used by all living organisms. The manner and rate at which nutrients are cycled play a critical role in rangeland health and are directly influenced by land management practices. Chemical elements circulate between the organisms and the environment through pathways comprising the natural cycles, the most important of which are probably (1) the hydrologic cycle and (2) the biogeochemical cycles of (i) carbon (ii) nitrogen (iii) phosphorus and (iv) sulphur. In the unpolluted environment, these cycles operate in a balanced state with little variation thereby contributing to the stability of the whole biosphere.

- **Energy flow**

Almost all life requires the energy that flows daily from the sun. The basic conversion of this solar energy to usable form takes place

through plant material on land and in water. The energy passes from plants to whatever eats them, moving up the pyramid. Unlike nutrient, energy doesn't cycle; it flows through the ecosystem until it is used up. The flow of energy in an ecosystem is sometimes referred to as the carbon cycle because carbon is involved in all energy storage and transfer. Energy flow is closely related to the other ecosystem processes-water cycling, mineral cycling and succession. It in fact drives these activities and makes them possible. As energy flows through an ecosystem, it passes through several levels known as trophic levels and each time energy flows to another trophic level, approximately 90 percent of the useful energy is lost, usually as heat to the surrounding (Enger and Smith, 2006).

- **Community dynamics**

Community Dynamics is also called plant and animal succession. With few exceptions, natural communities strive to develop toward ever-greater complexity and thus stability. From unstable bare ground, where biological activity is low, stable range or forest communities develop over time. When humans reduce this complexity by planting monoculture crops or clearing vegetation from an area, for instance, they so defy the principles of nature that they can only be maintained by unnatural means, and then only temporarily. As components within nature, humans cannot escape this principle any more than other organisms can. An ecosystem's abiotic and biotic composition and structure is determined by the state of a number of interrelated environmental factors. Changes in any of these factors will result in dynamic changes to the nature of the system. The process of change is the only constant process in all ecosystems.

In order to have an effective water or mineral cycle, or adequate energy flow, an ecosystem must have communities of living organisms. For living things to thrive, they need effective energy flow to feed them, a water cycle that supplies adequate moisture, and a mineral cycle that supplies vital nutrients. The four processes work together to create a healthy or unhealthy ecosystem. It should now be evident that two processes proceed concurrently in ecosystems, the unidirectional flow of energy and the cycling of nutrient elements(Edward, 1996). As the green plant is grazed on, not only is

chemical energy in the form of carbohydrates, fats, and proteins transferred to the herbivores alone but so are a host of nutrients as well. Similarly, there is a transfer of both energy and nutrients from herbivore to carnivore and from all the preceding levels to the decomposers. Thus energy flow must accompany nutrient cycling and cycling must accompany energy flow.

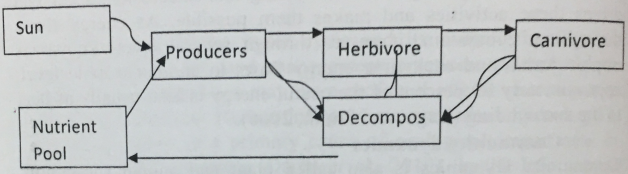


Figure 1: Model of Energy and Mineral Movement in Ecosystem.
Source: Adapted after Edward (1996).

Causes of Ecosystem Imbalance

In rural surroundings, direct daily contact with the basic natural resources was prevalent, especially within man's immediate environment. Ecosystem balance existed when environment was in control of man activities, but imbalance set in when the man learnt how to control the environment to suit his desire. According to Stapp (1969), as man became progressively urbanized, his intimate association and interaction with nature diminished and with it, his awareness of his dependency on them.

Everyone in the world depends completely on Earth's ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment. Ever since he appeared on the face of the Earth, man has exploited and modified the environment to his advantage in many ways. To meet his basic needs, he relies on the ecosystem around him, just as all living things do. Over the past 50 years, man have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food,

fresh water, timber, fibre and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth. Many anthropogenic phenomenon account for the modification of ecosystem processes namely; population growth, urbanization and industrialization, socio-economic change, needs for growth and development, and technological advancement.

Attempts by humans to meet the need of their incessant population increase result in over-utilization of (exploration and exploitation) available natural resources of the environment faster than their formative period. As the world population increased, natural forests were cleared for housing and farmlands which eventually grew into the towns and cities. Trees were cut for fuel and buildings, roads were built and eventually paved. Population growth results to the expansion of settlements into towns and cities, and the need to meet up with the demand of the populace also trigger the industrial location. Industrial activity is the backbone of present day development and progress as it provides products, brings revenue, created employment opportunities and provides a supporting service to other activities and programmes.

To achieve all these, natural environment need to be modified, natural resources are required for the production and maintenance of equipment at the detriment of biota, plants and animals. The discovery and exploitation of non-renewable mineral resources such as crude oil and coal for fuel which are the reservoirs and chambers of trapped carbon over millions of years drastically influenced the ecosystem due to their societal and industrial value. Industrial, domestic and commercial utilization of fuel and energy adversely altered ecosystem compared to other cause from their extraction point to the final consumption.

The ways that people interact with the environment have changed over time. Before the widespread use of technology, people had a relatively low impact on the environment. They used available plants and animals for food and clothing and live in a simple shelters. Human demand for more consumer products often conflicts with the health of ecosystems and the plants or animal living there. In our

haste to satisfy our wants, we often forget the basic needs of plants and animal. The use of insecticides also disturb the biodiversity as the kill the untargeted micro-organisms. The droppings of grazing animals in fallow-lands previously used to maintain the nutrient cycle of agricultural land. The intensive agriculture in an effort to get three harvest in a year under the pressure of burgeoning population has greatly reduced the practice of land-grazing by animal.However, irrespective of minor or extensive modification that might have been taking place in an ecosystem, there are feedback consequences over time.

Implications of Ecosystem Imbalance

Climate change and global warming are synergy in nature in relation to other environmental and ecological problems caused by human activities in the ecosystem. Irregularity in climatic parameters that determine the adequate functioning of ecosystem result in imbalance in the expected input and output on the earth surface. The major environmental impact of which include loss of biodiversity, rising sea level, disruption of hydrologic cycle; navigation, hydropower, water supply and demand, food control, environmental quality, recreation, and political issues.

Natural forest is regarded as carbon sink, its destruction for settlement expansion and survival leads to the accumulation of carbon in the atmosphere and adverse effect on agriculture. According to Smith and Enger (2006), a carbon dioxide concentration of 550pm is likely to increase crop yield in some areas by as much as 30 percent to 40 percent, but it will decrease yield in other places by similar amount, even for same crop. Alteration of plant and animal communities has been the root cause of species extinction (loss of biodiversity) in ecosystem. Inability of the nutrients to circulate between the pools, and energy to flow from the sun across the trophics adversely disrupt the normal function of an ecosystem. Uninhabitable water, impoverish land, decline in forest and animal result to the low agricultural production, high cost of production and food security problem. Agro-based industries may fold-up as a result of lack of raw materials substitutes, issue of unemployment, product scarcity and

proliferation of the abject of poverty especially in developing countries.

Series of diseases are militating against the world now due to the massive consumption of organic agricultural product compared to the genetic. Acidified lake due to the untreated sewage discharged has drastically reduced the aquatic animals, those that can sustain are biologically bond with carcinogenic metabolism. This has been the consequence of the shortage of plant and animal lifespan. Environmental degradationsuch as soil erosion, pollution, desert encroachment, and flood are the order of the day globally. Excess and scarcity of water through rainfall and snow are more or less curses or blessings in many localities contrary to the predominant situation before.

Ecosystem Balance, Environmental Sustainability and Environmental Education

In rural surroundings, direct daily contact with the basic natural resources was prevalent, especially within man's immediate environment. As man became progressively urbanized, his intimate association and interaction with natural resources diminished and, with it his awareness of his dependency on them (Stapp *et al*.,1969). Information revealed that majority of people lack understanding about ecosystem function and have no regard for the environment. Civilization, urbanization, population and socio-economic changes caused the depreciation in the attributable value and aesthetic for the environment. Respected traditional superstition and taboo that initially protect the aesthetic of the environment before are no longer there.

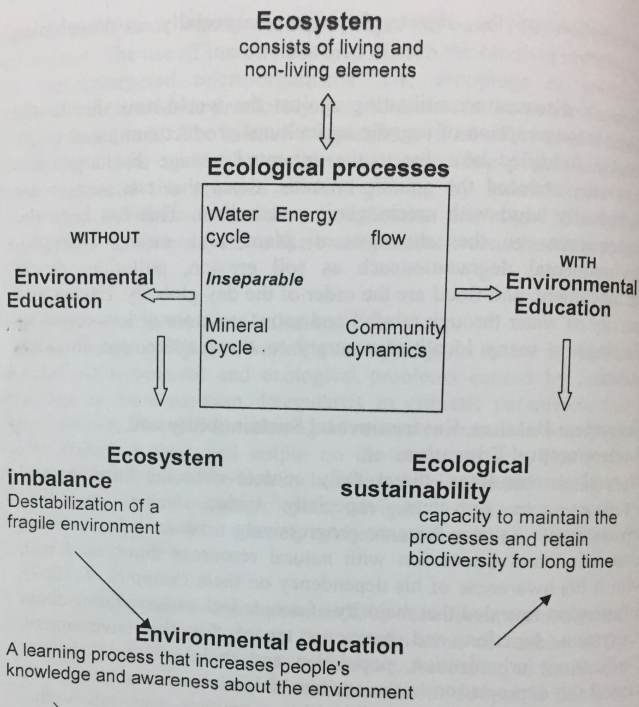


Figure 2: Environmental Education as a Link between Ecosystem Processes and Ecological Sustainability
Source: Adapted from Ajibade (2013)

In order to safeguard the environment to ensure ecosystem balance for attainment of environmental sustainability, there is need for thorough environmental education. Environmental sustainability involves making decisions and taking action that are in the interests of protecting the natural world, with particular emphasis on preserving the capability of the environment to support human life. (SmallBuz

Connect, 2013). Now, for one to be able to take decisions that will reduce man's negative impact on the environment, such person needs to knowledgeable about the environment. Hence, the need for what we can call environmental awareness which can be created through environmental education (Figure 2)

Environmental education according to International Union for the Conservation of Nature (IUCN, 1971) is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among men, his culture and his biophysical surroundings. Environmental education is a viable tool for solving the problem of ecosystem imbalance because according to seven directive principles of environmental education (EE), summarized by the 1977 Tbilisi Conference, environmental education is a lifelong educational process that occurs at all levels of education. Environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environmental and its associated problems, aware of how to help solve these problems, and motivate them to work towards their solutions (Stapp*et al.*, 1969).

According to Disinger and Monroe (1994), environmental education is based in knowledge about ecological and social systems. It draws on and integrates knowledge from disciplines that span the natural, sciences, social sciences, and humanities. Environmental education considered humans and their creation to be part of the environment, along with biological and physical phenomenon. It emphasizes the role of attitude, values, and commitments in shaping environmental issues.

Conclusion and Recommendations

Fundamentally, both man and his environment are inseparable. Environment influences man activities through science and technological advancement. Through man initiative and innovation in technology, he has continued to devise coping mechanism to adapt to the adverse effect of the ecological imbalance within the environment. Various predicaments have been in existence since as a result of

human activities especially when man refused to act under the control of the environment. Population expansion, socio-economic changes, industrial growth and development severely influence the environment beyond the reasonable doubt. These are the main causes of ecosystem imbalance with the effect like climate change and global warming, loss of biodiversity, shortage of lifespan, environmental degradation; pollution, erosion, desert encroachment and other related issues.

Healthy ecosystems are necessary to the survival and flourishing of humans and other organisms. There are a number of major ways of reducing negative human impact. The first of these is environmental management, an approach based largely on information gained from earth science, environmental science and conservation biology. The second approach is management of human consumption of resources, which is based largely on information gained from economics. A third more recent approach adds cultural and political concerns into the sustainability matrix. Now, it is glaring that all the required information revolves round the discipline of geography, the science that studies the lands, the features, the inhabitants, and the phenomena of the Earth.

In order to attain environmental sustainability, environmental education should be spread to the people through formal, non-formal and informal educational systems.Formal education as a system of schooling involving institutionalized teaching and learning in relation to a curriculum. Thus, curriculum development should lay emphasis on Geography right from primary school level to the higher institution of learning across the globe. In British Curriculum for instance, Geography is compulsory though, at the elementary classes. In higher schools of learning, apart from specialized departments in environmental education, it must be regarded as compulsory course up to certain level. It should be referred to as institutional course as we have faculty courses which must be passed before a candidate can be graduated. Adoption of environmental education in African higher school of learning even as a criteria for the admission into science related courses will sporadically spread the respect for the

management of an environment. Moves towards this are exemplified in Nigerian Education Research and Development Council (1992), which produced draft curriculum for infusing Environmental Education in Secondary School. This was buttressed by Adedayo and Olawepo (1997) in their presentation of approaches through which environmental education can be incorporated into social science curricula in secondary schools.

In the case of non-formal education, the same focus of subject should be maintained but may not necessarily be in recognized formal learning environment like school. Such typically involves workshops, community courses, interest based courses, short courses, or conference style seminars. However, for informal education which has to do with learning outside of a standard school setting (unschooling/homeschooling and autodidacticism/self-teaching), efforts should made to concentrate on environment-related issues. In this direction, environmental related cultural festivities, superstition and myths should be promoted. The mass media should focus on helpful aspects of the environment while the National Orientation Agency should organize activities that will create environmental awareness.

This study concludes following Ajibade (2011), that if people are aware of the dangers in some of their actions (which lead to ecosystem imbalance), it will bring about a positive change and thereby prevent any future catastrophe that may arise from environmental problems. It can thus be posited that the magnitude of the existing environmental problems depends on the individual's level of environmental awareness and perception. Therefore, there is the need to re-awake and re-orientate the individual's mental state of perception to the environment through environmental education.

References

Adedayo, A. and Olawepo, J.A. (1997). Integration of Environmental Education in Social Science Curricula at the Secondary School Level in Nigeria: Problems and Prospects. *Environmental Education Research,* 3(1):83-93.

Ajibade, L.T. (2011). Creating Environmental Awareness Techniques in Nigeria. In:

Opoku- Agyemang, K. (Ed.). *Culture, Science and Sustainable Development in Africa.*Refereed Papers from the First University of Cape Coast and University of Ilorin Joint International Conference, Pp. 513-524.

Ajibade, L.T. (2011). Creating Environmental Awareness in Nigeria.*Proceedings.*First Joint International Conference of University of Cape Coast and University of Ilorin held in September, 2009.

Arthington, A.H., Bunn, S.E., Poff, N.L. and Naiman, R.J. (2006). The Challenge of Providing Environmental Flow Rules to Sustain River Ecosystems. *Ecology Application,* 16:1311-18

Christopherson, R.W. (2002). *Geosystem: An Introduction to Physical Geography.* Prentice Hall Publication, New Jersey. pg.557.

Daren, M.C., David, M.W. and Micheal, R.M. (2010).Frontiers in Ecology and the Environment.The Ecological Society of America.pg.1-7.

Disinger, J.F and Monroe, M.C.(1994). Defining Environmental Education.An EE Toolbox *Workshop Resources Manual.* Ann Arbor, MI: University of Michigan, National Consortium for Environmental Education and Training.

Edward, J.K. (1996). *Concepts of Ecology.*4th Ed., PHI Learning Private Limited, New Delhi.

Enger, E.D. and Smith, B.F. (2006).*Environmental Science: A Study of Interrelationships.* McGraw Hill, New York.

Robert, L.S. (1996). *Ecology and Field Biology*.Fifth Edition. Harper Collins College Publishers, U.S.A

Rusell, T.D., Mannion, C.W., Parry, N. and Townshend.(1993). *Process in Physical Geography.* Longman, NY. P. 288.

Stapp, W.B. (1969). The Concept of Environmental Education.*Environmental Education*, 1(1):33-36.

Susan, M. (2004).*Oxford Dictionary of Geography.*3rd Edition.Oxford University Press.

UNESCO (I978). Intergovernmental Conference on Environmental Education. Paris: *Final Report,* UNESCO ED/MD/49. (Accessed from www.answers.com.2013)

Willis, A.J. (1997). Functional Ecology.*British Ecological Society.*11,268-271

World Institute for Conservation and Environment (2012).*The Ecosystem and Definition.*

(Accessed from*www.ecosystem.ws/ecosystem-concept.htm.* 03/12/ 2012).