

Environmental Management Education for Sustainable Development in Nigeria

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A major challenge that has faced the human race the world over, especially since the 1970s, is the myriad of environmental problems arising from man's quest for rapid economic development. Countries worldwide have been developing their national policies on the environment to ensure, among others, that environmental concerns are integrated into the major economic decision-making process. Nigeria's document identifies 21 strategies, including Education, for the implementation of the policy. Environmental management is practically multi-disciplinary in scope and requires the training of professionals that will be equipped with critical and analytical skills to provide both preventive and corrective measures to address all types of environmental problems. Unfortunately, only 31 out of 141 Universities and other 52 degree/HND/NCE awarding tertiary institutions in Nigeria offer environmental management programs. This extremely too low and poor record, partly explains why Nigeria's environmental problems seem difficult to tackle. To effectively implement the policy applying the education strategy, through environmental management education is key. This paper therefore recommends that an appropriate and potent educational curriculum at all levels (i.e. from the primary, through secondary to the tertiary level) would lead to sustainable capacity building through environmental management education for sustainable national development.

Key words: Environment, sustainable development, capacity building, environmental management, environmental education, environmental management education.

INTRODUCTION

Man's relationship with his environment has passed through several phases, from the time man was shaped by the environment, acted as a selecting agent and controlled the evolution of his present features (environmental determinism), to the present time when he, more or less, has relative mastery over his environment. This has actually evolved through the different cultural changes from when man was a hunter-gatherer, through agricultural revolution and the industrial-medical revolution, to information-globalization revolution. Through all these cultural changes, man has impacted on the environment in different magnitudes. Though population growth is only one of the many factors that affect land use, its rapid increase in Nigeria, coupled with a search for a better living standard of the people, has put enormous pressure on the natural environment. This is due to the unsustainable exploitation of natural resources, such as oil in the Niger Delta region, the damaging of the rainforests and woodland through logging, agricultural clearing, and infrastructural development, pollution of air, land and water, desertification and biodiversity loss.

This myriad of environmental problems have faced the entire human race since the 1970s, especially the Developing/Less Developed Countries (LDCs) like Nigeria, where economic development has been equated to national development. This mindset is akin to the human-centered (anthropocentric) world view that underlies most industrial societies, especially the belief that "all economic growth is good, more economic growth is better, the potential for economic growth is unlimited". However, since the United Nations World Commission on Environment and Development released the Brundtland report in 1987, and the United Nations Conference on Environment and Development published the Earth Charter in 1992, countries worldwide has been developing their national policies on the environment, because not all developments are sustainable. For example, the Federal Republic of Nigeria in 1998 launched her National Policy on Environment which requires that a number of complementary policies, strategies and management approaches are put in place which should ensure, among others, that:

- Environmental concerns are integrated into the major economic decision-making process;
- Environmental remediation costs are built into major development projects;
- Economic instruments are employed in the management of natural resources;
- Environmentally friendly technologies are applied;
- Environmental Impact Assessment is mandatorily carried out before any major development project is embarked on.

The document identifies 21 strategies, including Education, for the implementation of the policy. As the relationship between man and nature is necessarily complementary, appreciation and protection of the environment should be fostered at all levels of both formal and informal education (FEPA: NPE, 1998). The document further states that the development and support of the education sector will lead to the inculcation of environmental ethics in the people and mobilize them, individually and collectively, to accept the responsibilities of protecting the environment and ensuring rational utilization of the available natural resources. To achieve this, the Government shall:

- a. Promote comprehensive curriculum reviews that integrate environment and development concepts in the educational curricula at all levels;
- b. Support the development of courses and programs leading to the award of degrees and diplomas in environmental sciences, environmental management and technology;
- c. Encourage gender balance education at all levels, including continuing education opportunities and literacy programs;
- d. Encourage practical training programs for graduates of tertiary institutions to prepare them for labor market requirements and creation of sustainable livelihoods;
- e. Strengthen vocational training that facilitates the development and assimilation of environmentally sound, socially acceptable appropriate technology and know-how;
- f. Establish and support centres of excellence in interdisciplinary research and education in the areas of environment and sustainable development;
- g. Emphasize training and retraining of teachers, administrators and educational planners in environmental education and development issues;
- h. Assist schools to design and sustain an environment related activities including the establishment of environmental awareness clubs and associations;
- i. Support educational institutions to develop and provide appropriate training programs on environment and development issues to decision makers, business class, journalists, community leaders; etc.
- j. Promote research on and development of indigenous knowledge to facilitate sustainable adaptation of relevant technologies;
- k. Adopt community based approaches to public education and enlightenment through cultural relevant social groups, voluntary associations and occupational organizations;
- l. Collaborate with media, entertainment and advertising agencies in enhancing environmental awareness;
- m. Encourage the United Nations and other donor agencies to emphasize capacity building in all development programs through adoption of the multi-disciplinary approach to skill transfer;

- n. Encourage research linkages and staff/student exchanges between Nigerian educational institutions and institutions abroad in the areas of environmental studies and sustainable development;
- o. Encourage public relations activities which tend to provide a forum and context for the debate on sustainable development and the articulation of the collective vision of the future;
- p. Promote public awareness activities through traditional and mass media and Non Governmental Organizations (NGO) participation structures to keep them informed about all aspects of the policy;
- q. Support public participation activities covering formal and informal education and training to help carry out needed changes or strengthen values, knowledge technologies and institutions with respect to priority issues and also to support active concern for the quality of the environment;
- r. Support Environmental Information Systems at a number of levels: national, regional and global.

2. ENVIRONMENTAL MANAGEMENT AND ENVIRONMENTAL EDUCATION

With increasing complexity of environmental problems, education in Nigeria should focus on instilling environmental responsibility and accountability from primary through secondary and tertiary levels, not under minding informal education. The Nigerian Conservation Foundation (NCF) instigated and motivated the fusion of an environmental education (EE) element into citizen education curriculum in 1990 national curriculum review conference. The UNESCO sponsored National Workshop on the integration of EE elements in the National curriculum and teacher program subsequently followed. All these have been efforts made through education, to manage the environment. Apart from establishing many environmental laws and formal institutional structures to manage the environment, Nigeria is also a signatory to many international agreements and conventions. Okaba (2004) and Robinson (2013) observe that despite the proliferation of these legal and regulatory arrangements, environmental degradation has remained on the increase. This is as a result of ineffective enforcement of the laws (Okaba, 2004), human population growth, technology, laissez-faire economy (Uwadiogwu & Iyi, 2015) as well as poor public and civic consciousness of the implication of environmental degradation on the socioeconomic development of the society.

Sethuraman (1992) noted that the extent to which any country depends on its natural resources for its growth is a key factor in determining the environment-development interrelationship. Economic growth and development of any society requires the use of its resources for the improvement of the welfare of the people, and development can only be sustained when these resources are used rationally. Developmental strides should be sustainable, however, this is not the case as some can only be short-term and cannot be sustainable. It is therefore imperative to distinguish between economic, national and sustainable developments. Economic development is the sustained, concerted actions of policy-makers and communities that promote the standard of living and economic health of a specific area. It can also be referred as the quantitative and qualitative changes in the economy. Economic decisions are made with little regard for the environmental impact. National development on the other hand, refers to the ability of a nation to improve the social welfare of the people, e.g. by providing social amenities such

as quality education, potable water, transportation infrastructure, medical care, electricity/power, etc. Meanwhile, sustainable development is the development process that promotes conditions essential for an enduring human presence. Environmental management is therefore the key to its success since the environment is essential to satisfying the needs of present and future generations.

3. ENVIRONMENTAL MANAGEMENT EDUCATION AND SUSTAINABLE DEVELOPMENT

Since the 1960s, different approaches have been employed for solving environmental issues. Environmental science, as one of them, is a multidisciplinary, problem-oriented, applied science that seeks to understand the many ways that we can address these issues; it draws on research and expertise of specialists from numerous traditional sciences and humanities (Chiras, 2010). It is widely agreed that education, be it formal or informal, is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow. According to Nelson Mandela in his speech on June 24, 1990 at Madison Park High School, Roxbury, Boston, 'Education is the most powerful weapon which you can use to change the world.' UNESCO (1997) emphasized its importance noting that, 'educated minds and instincts are needed in every walk of life.' With the increasing complexity of environmental issues, education is a necessary tool for instilling environmental responsibility and accountability through environmental education. Environmental education is an effective instrument for creating consciousness of ecological balance. Environmental education, within the school and outside the school system, refers to organized efforts to teach how natural environments function, and particularly how human beings can manage their behavior and ecosystems to live sustainably. To guide the course of environmental education, UNESCO and UNEP created three major declarations: the Stockholm Declaration, 1972, the Belgrade Charter, 1975 and the Tbilisi Declaration, 1977. The objectives of EE endorsed at the Tbilisi Conference (UNESCO-UNEP, 1977) include:

- Awareness: to help social groups and individuals acquire an awareness of and sensitivity of the total environment and its allied problems.
- Knowledge: to help social groups and individuals gain a variety of experience in, and acquire a basic understanding of the environment and its associated problems.
- Attitude: to help social groups and individuals acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.
- Skills: to help social groups and individuals develop skills for the mitigation of environmental problems.
- Participation: to help social groups and individuals develop a sense of responsibility in solving environmental problems.

Since environmental education is a strategic tool for environmental management, meeting these objectives will go a long way in tackling environmental problems. Environmental management is very broad in scope with its diversity of specialism, having a concise definition, is difficult. Whatever the definition is, environmental management displays the following characteristics: it supports sustainable development, often used as a generic term, and deals with a world affected by humans (Barrow, 2006). It should be noted that there exists

a critical linkage between education and sustainable development as it is only an educated society in the field of environmental management that would duly understand the implications of certain activities on the earth. Environmental management can simply be defined as the management of the interaction and impact of human societies on the environment.

The terms "environmental management education," "environmental education," "conservation education," "outdoor education," and resource (or resource-use) education" are often used interchangeably and are confused. For this study, environmental management education is defined as a learning process of developing knowledge, awareness and skills within the educational community of the human-environment interactions to achieve sustainability. Harrison, Inyang and Udo (2008) conceptualized environmental management education as a process aimed at creating awareness and developing the right attitude and skills necessary to guarantee environmental sustainability. Though the term is often used to imply education within the school system, it is sometimes used to include efforts to educate the public and other audiences, including print materials, media campaigns and websites.

Environmental management, though new, is evolving rapidly; it is important for more and more sectors of human society and plays a crucial role in establishing sustainable development. Most environmental managers would accept that sustainable development is one of their key goals, but providing a universally acceptable definition of sustainable development is not easy. Though it has been variously defined and described, it is not a fixed notion, but rather a process of change in the relationships between social, economic and natural systems and processes. The most acceptable and quoted definition is that by the World Commission on Environment and Development (WCED, 1987): "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Other definitions have extended the notion of equity between the present and the future, to equity between countries and continents, races and classes, genders and ages. Development is all about improving the well-being of people and sustainable development is fundamentally about reconciling development and the environmental resources on which society depends. Elliot (2006) summarized sustainable development as maintaining development over time.

In a quest for sustainable development, the goal of environmental management may be said to stretch what nature provides for the optimum and maintain that expansion indefinitely without environmental breakdown, in order to maximize human well-being, security and adaptability (Barrow, 2006). This recognizes the fact that the prevailing notions and definitions of development must themselves evolve in relation to changing requirements and possibilities. Caring for the Earth (IUCN, UNEP and WWF, 1991), for example, notes that a sustainable economy "can continue to develop by adapting, and through improvements in knowledge, organization, technical efficiency and wisdom". This means being aware of the significance of sustainability within natural environmental systems. Sustainability and sustainable development are not the same, but are often used as if they were. The former is the ongoing function of an ecosystem or use of a resource (i.e. Maintenance of environmental quality), the latter implies increasing demands for improving well-being and lifestyles and, probably, in the foreseeable future, for a growing population (Becker and John, 1999). Sustainable development must therefore be a pro-active strategy to develop sustainability.

4. CAPACITY BUILDING FOR SUSTAINABLE DEVELOPMENT

The phrase “capacity building” incorporates within it other terms such as “training,” “professional development,” and “professional education.” It may also, depending on the user, include broader processes such as “community development,” the improvement of institutional arrangements, and the strengthening of accountability mechanisms, as well as general educational activity. According to the United Nations Environment Program (UNEP, 2002), sustainable development is the goal, and capacity building is a means to achieving it. Therefore, to achieve sustainable development, the development and strengthening of human and institutional resources have to take place. As earlier noted, development is about people and their societies interfacing and developing within their environment. Capacity building is a process by which individuals, groups, institutions, organizations and societies enhance their abilities to identify and meet development challenges in a sustainable manner (CIDA, 1996). The United Nations Development Program (UNDP) (1997) also defined it as “the process by which individuals, groups, organizations, institutions and societies increase their abilities: to perform functions, solve problems and achieve objectives; to understand and deal with their development need in a broader context and in a sustainable manner”. The goal of this process is to tackle problems related to our policies and methods of development as they affect the environment for the benefit of both the present and future generations. UNEP (2002) described capacity building as building abilities, relationships and values that will enable organizations, groups and individuals to improve their performance and achieve their development objectives. Alley and Negretto (1999) stated that within the numerous definitions of capacity building is the consensus that it involves the long-term contributions to sustainable social and economic development, being a catalyst and constant fuel for a process of change. DFID (2010) summarized that the principles that underpin a good capacity building are: it is a process; it strengthens existing processes; it ensures full local ownership; it plays the role of external expertise; it requires organizational development, and its needs for skills and resources need to be regularly assessed; and, people perform better in groups when there is collaboration and partnership. Capacity building is one of the four thrusts of Education for Sustainable Development. Identified in Chapter 36 of Agenda 21 as essential to support a sustainable future, is an important component of lifelong learning. Environmental management education, therefore, is an important component of national capacity building which is a sure guarantee for sustainable development.

5. ENVIRONMENTAL MANAGEMENT EDUCATION IN NIGERIA

Environmental management education as an academic and professional discipline is relatively new, it is equally evolving rapidly. Since environmental issues are intertwined with socioeconomic issues, the complexity of the fallouts of our development has necessitated the training of skilled manpower built from an interdisciplinary, multidisciplinary and holistic approach emphasizing stewardship rather than exploitation and managing a situation with the goal of long-term sustainable use through problem solving, practical tools, developing governance, and policy formulation. To achieve this, the following objectives have to be met in the process:

- To promote academic excellence through the training of technocrats and functional, environmental planners, designers, implementers and managers

capable of managing the environment based on the concept of sustainable development.

- To provide an in-depth knowledge in environmental management concepts and the use of modern equipment and techniques to manage it.
- To provide sound background knowledge and a reasonable compact view of the entire environment with emphasis on matters that are of concern to humanity.
- To be able to tackle the challenges in experimental methods and techniques in making observations on the field, and to develop a mission-oriented research to meet the challenges of the changing environment.

Since environmental management has become more coordinated and participatory and much more integrated, achieving the above objectives, graduates of environmental management should have career opportunities that are good, wide and still growing from both the private to the public sectors. They should work in teams with Architects, Engineers and Horticulturalists, and on a broader scale with resource managers and planners. Environmental managers provide input for a range of projects for private, institutional and government clients, which include civic development, urban design, tourism development, residential, commercial, industrial, parks, highways and heritage conservation. Recent studies, such as Uwadiogwu and Iyi (2015), have affirmed that the level of environmental education awareness in Nigeria is still very low. The universities are the apex organizations in the Higher Education system which in Nigeria consists of about 141, representing a powerful force of change. With this large number and other 52 degree/HND/NCE awarding tertiary institutions in the country, only about 31 offer environmental management programs (see Table 1). These are scattered in different faculties from Environmental Sciences to Management Sciences. This means that the program in different faculties will have different philosophies. Thus, courses taught, either as core or elective vary from one university to the other and some common ones still vary in content. Where the program exists, there are no or insufficient instructional materials and staffing (see Table 2). Environmental education can be delivered as a single subject or it can be infused into existing subjects within the curriculum. At the primary school it is infused in many subjects and centres on the social, cultural and biophysical environment (Robinson, 2013). Even though environmental concepts are taught in various subjects at the secondary school level, environmental education is only incorporated as Module 10 of Citizenship education curriculum. There has been no serious attention given to it until recently when the subject was launched as one of the subjects to be taken at West African Examination Council exams. These weaknesses have contributed to the very low environmental awareness and responsibility, as well as the low application and enrollment of students in the Environmental Management programs as indicated in the data for 2010/2011 academic session presented in Table 2. According to Okojie (2015), the size of Environmental Management programs within the Nigerian University System had remained small even though the number has increased since its inception in 1976. These invariably will affect the building of capacity, which is presently being inadequate for sustainable development. Also, creating awareness and imparting knowledge in a non-formal way has been largely through the media. Most people neither read sections of the print media on the environment nor watch such programs on television

Table 1: Environmental Management Education in Nigeria

S/N	Programme/ Department	Faculty	University
1	Environmental management	Environmental Sciences	Crescent University; Ekiti State University; Kaduna State University; Kano State University; Nnamdi Azikiwe University
2	Environmental Management Technology	Environmental Sciences	Anambra State University; Abubakar Tafawa Balewa University; Novena University University of Port Harcourt.
3	Environmental Management and Control	School of Technology	Igbinedion University
4	Environmental Resource Management	School of Technology	Abia State University
5	Environmental Management & Toxicology	Science Agriculture	Elizade University; Federal University Dutse; University of Agriculture Abeokuta.
6	Forestry/wildlife & Environmental Management	Agriculture	Michael Okpara University of Agriculture
7	Forestry & Environmental Management	Agriculture	Benson Idahosa University
8	Toxicology & Environmental Management	Agriculture	Michael Okpara University of Agriculture
9	Soil & Environmental Management	Agriculture	Crawford University; Ebonyi State University; Evan Enwerem University; Kogi State University.
10	Geography & Environmental Management	Management Sciences	Evan Enwerem University; Godfrey Okoye University; University of Ilorin.
11	Environmental Education	Education	Abubakar Tafawa Balewa University; Bayero University; Ekiti State University; Niger Delta University; University of Abuja; University of Benin; University of Calabar; University of Maiduguri; River State University of Science & Technology.
12	Resource Management	Management Sciences	University of Calabar;

Source: JAMB UMTE Brochure, 2014/2015

Table 2: Student Enrolment, Graduate output and Academic staffing in Environmental Management Programmes

Index	Environmental Management programmes	Environmental Management Disciplines	Nigerian University System (NUS)	Programmes as % of Discipline	Programmes as % of NUS
Student enrolment	3,236	385,789	862,592	0.84	0.38
Graduate Output	665	79,554	182,683	0.84	0.36
Academic Staff	141	16,390	35,734	0.86	0.40

Source: Okojie (2015)

6. APPROPRIATE AND POTENT ENVIRONMENTAL MANAGEMENT EDUCATION FOR SUSTAINABLE DEVELOPMENT IN NIGERIA: THE WAY FORWARD

Environmental management education should address the issue of sustainable development. Since environmental education is issue-based, the approach to this challenge lies in the educational approach. In order to develop an environmentally literate national citizen for sustainable development, there is a need for the revision of the existing

syllabi at all levels of education. Environmental education should be taught as a subject in schools. Additionally, the scope and sequence should portray the scope of the recommended environmental program and show a defensible sequence which would make conceptual (and skill development) sense to instructors and learners alike. Infusion is a relatively simple process to understand, but a rather complex process to accomplish. Simply stated, it refers to the integration of content and skills into existing courses in a manner so as to focus on that content (and/or skills) without

jeopardizing the integrity of the courses themselves. In this case, teacher preparation and curricular materials should be put in place to help achieve the desired goal. At this stage also, education should be more action-oriented, where students engage in real-life issues. Hungerford et al (1994) affirmed that the major content area associated with environmental education is that of environmental issues. They further stated that because of the unique developmental characteristics of the middle school learner (10-15 years), the most appropriate focus of instruction is on real-life problems and on the encouragement of independent critical thinking.

At the tertiary level, it is recommended that environmental management is a compulsory program in all the institutions. A more organized and comprehensive curriculum should also be adopted by all and up-to-date instructional materials should be used to empower the students with scientific, economic and social management skills applied in the understanding, planning, utilizing and managing the environment. The integration of sustainability into various degree programs is also recommended. All university students should acquire an understanding of the importance of sustainability, where emphasis is laid on inquiry-based problem-solving approaches, interdisciplinary and critical thinking, as well as using relevant case studies and identifying best practices. For example, Obafemi Awolowo University, Ile-Ife (a member of Mainstreaming Education and Sustainability in African Universities) has mainstreamed sustainable development issues into four programs in the Humanities, namely Religious Studies, Philosophy, History and Sociology. The focus is on considering values and ethics associated with sustainability issues, integrating environmental sustainability issues into the curriculum, introducing concepts of campus stewardship, and community service initiatives that address environmental sustainability issues. Problem-solving approaches and motivation to contribute to social change are approaches that are being integrated into these curricula (UNEP-UNESCO-AAU, 2008).

Effective development requires a strong capacity, and this is particularly true for sustainable development, where a failure to maintain and upgrade technology or a breakdown in the incentive system necessary to capture the negative externalities can have dire consequences. Chapter 37 of Agenda 21 emphasizes the need to build domestic capacity from the national to the municipal level with the cooperation of the non-governmental sectors. This therefore calls for a proactive approach through environmental management.

7. CONCLUSION

The search for the solution to the consequences of unbridled use of our natural resources has culminated into the development of a new and evolving discipline in the applied sciences called, Environmental Management. As an art that seeks to balance human demands upon the Earth's natural resource base with the natural environment's ability to meet those demands on a sustainable basis, a productive labor force that is environmentally knowledgeable, conscious and skilled is needed to manage the scientific and technological

impacts of human excesses on the environment. To achieve these, the paper advocates the development of effective environmental curricula in Nigeria's educational system from the primary level to the tertiary. Also, the scope and sequence of environmental management education are recommended to portray the scope of environmental programs, including the integration of environmental sustainability into the degree programs.

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