

ENVIRONMENTAL LITERACY FOR ACHIEVING SUSTAINABILITY OF ENVIRONMENTAL QUALITY IN NIGERIA

Dr. Mbalisi, Onyeka Festus

Department of Adult & Non-Formal Education, Faculty of Education
University Of Port Harcourt, PMB 5323 Choba, Portharcourt
Rivers State, Nigeria

Ndulor, Chukwuma Christopher

Department of Adult & Non-Formal Education, Faculty of Education
University Of Port Harcourt, PMB 5323 Choba, Portharcourt
Rivers State, Nigeria

ABSTRACT: *Actions of people lead to environmental degradations which in turn affect human growth and development. Human actions arise out of human's perception of the environment as a resource for satisfying human needs. This reveals that environmental problems are behavior problems. The paper therefore recommends environmental education as a tool for making Nigerian citizens environmental literate which would engender action and activities that will lead to environmental sustainability in Nigeria. It concludes that environmental education organized in formal, non-formal and informal contexts should be taken seriously in order to make the citizens environmentally literate.*

KEY WORDS: environmental literacy, sustainability, environmental quality

INTRODUCTION

Concern about threats faced by the environment started in the 1960's as a result of writings and research findings of environmentally conscious writers and scholars. The writings revealed that various human activities are sources of problems which pose serious threats to environmental quality. For instance, Rachel Carson's 1962 "Silent Spring" revealed that chemicals manufactured and used for insect populations and weeds control had deleterious effects far beyond the purpose for which it was intended. In recent times, other chemicals have also been manufactured and used to boost food production in order to cater for the unprecedented human population explosion. The introduction of these chemicals (such as fertilizers, growth hormones, pesticides, herbicides, etc) into the food web is taken to be the cause of some abnormalities in human body system such as obesity, cancerous growth, reduction in human immune level, etc. These chemicals do not only spell doom on human existence but result in the degradation of environmental quality such as imbalance in soil acidity and alkalinity levels, increase in the

nutrient level of water with a consequent decrease in oxygen content of water resulting to increase in the morbidity rate of aquatic organisms.

Another event in human era that did a great deal on the environment and human existence was the replacement of human muscle with machines as source of energy for production of goods. This event is known as industrial revolution which started in the 16th century. It was during this period that fossil fuels (coal, crude oil and natural gas) were discovered and being explored, exploited and refined for use as major sources of power and energy for machines used in the factories and for agricultural purposes. Fossil fuels contain carbon as their major constituents which when broken from its chain in the process of exploration, exploitation, transformation/refining and use as energy source, combines with oxygen molecules to form carbon dioxide. Carbon dioxide is known today as the main greenhouse gas which leads to greenhouse effect with global warming and climate change as its effects. Global warming and climate change are highly dreaded environmental problems which constitute serious threat to human existence globally.

Other human activities triggered by industrial revolution which pose serious threat to environmental quality include: soil tillage, slash and burn (practiced during crop farming); use of formalin and dynamite for fishing; hunting of premature games; lumber logging; manufacturing and processing of goods; resources mining; construction of buildings, roads, dams and stadia; transportation and distribution of goods and services, consumption of goods and services, etc. The major purpose of these activities was to satisfy human needs and achieve improved quality of human life. But, it has been observed that while these activities try to fulfill the purpose for which they are embarked upon, they also lead to the degradation of environmental quality which in turn affects quality of human life.

This scenario is owed to the fact that environmental resources are involved in the execution of these activities which are explored, exploited, transformed/refined for the satisfaction of human needs and improvement of quality of human life. A major concern here is that the processes of exploring, exploiting, refining and utilizing environmental resources are unsustainable and therefore are responsible for the generation of environmental problems (Mbalisi, 2014); Mbalisi & Offor, 2015). Such environmental problems include among others: pollution, global warming, ozone layer depletion, climate change, biodiversity destruction and loss, improper waste disposal, deforestation, desertification, erosion, etc.

These problems according to Mbalisi and Ephraim (2017) could be attributed to ignorance of either the implications of adulthood activities on the environment or actions for preventing degradations that could result from adulthood activities. This implies that adults who engage in these activities lack knowledge, awareness, attitudes, skills and understanding of the causes, effects of and probable solutions to environmental issues and problems resulting from human activities. This assertion indicates that adults of present generation who engage in activities that

degrade the environment are environmentally illiterate. But, these elements (knowledge, awareness, attitudes, skills and understanding) are required to ensure that while activities are embarked upon to satisfy the needs of humans of the present generation with environmental resources, the environment is protected and conserved to enable it replenish its resources that would be needed by the people of future generations to satisfy their own needs in order to achieve improved quality of life and enjoy comfortable livelihood. This calls for the need to develop environmentally literate adults for sustained protection of environmental quality, especially in Nigeria.

The Concept of Literacy

Literacy has been universally seen as a human right. Many have defined the concept based on their background. Adult literacy is an important component of adult education because literacy serves as the foundation of all learning. The definition of adult literacy reflects the philosophy of adult learning and lifelong learning (Metro Toronto Movement for Literacy, 2015). Scribner in Keefe and Copeland (2011) commented that definitions of literacy shape the perceptions of individuals who fall on either side of the standard (what a literate' or non-literate' is like) and thus in a deep way affect both the substance and style of educational programmes. In their own view, Keefe and Copeland (2011) agreed that how literacy is defined affects the classroom instruction, community services and the literacy opportunities offered to students and adults with extensive needs for support. The truth about this concept is that the definition and scope of literacy depends highly on the language, the cultural context and the economic structure of each society. The broad range of definitions available without a clear consensus creates an opportunity for many scholars to become part of the contribution when literacy is defined.

Since literacy is an international issue, it is therefore paramount to consider the definitions of literacy by the United Nations and other international organizations. Literacy has been generally defined as the ability to read, write, and handle figures (Okedara, 1981). This definition is considered obsolete due to emergence of issues to which literacy is applied to resolve, but Akinpelu (2002) refers to it as "alphabetic literacy" which is the most fundamental foundation and tool for all forms of worthwhile and sustainable development. He maintains that it is the inevitable foundation for most other forms or types of literacies and other forms of literacies can only be genuine, authentic and sustainable if based on alphabetic literacy. Literacy is also regarded as the ability to communicate ideas and information in the right way at the right time, as well as to use computers and other types of problem-solving techniques that may involve mathematical calculations (Marango & Ndamba, 2011). Jarvis and Griffin (2003) hold that literacy as a skill can be best defined in its functional form through gaining possession of skills perceived as necessary by particular persons and groups in order to fulfill their own self-determined objectives as a family, job-holder, or members of social, religious or set of the other associations of their choices.

Literacy contributes to social progress and provides opportunities for success in other dimensions of development (economic, political, ecological/environmental, technological, etc). In support of this, the United Nations Development Programme in Marango and Ndamba (2011) recognizes that functional literacy is an entry point to empowerment, hence it brings together components of literacy skills development and income generation. Literacy goes beyond reading, writing and numeracy. It goes as far as incorporating the skills of reading, writing and numeracy in socio-economic activities. Mejiuni (2011) identifies economic stagnation and decline, rapid population growth, widening economic disparities among and within nations, war, violence, crime, preventable deaths of millions of children and wide spread environmental degradation as major societal problems to which literacy competencies could be applied to resolve. Oyebamiji (2006) tries to support this view when he asserts that “when literacy skills are properly developed, they could respond to recent economic, political and social transformations including globalization and the advancement of information and communication technologies.” It is from this perspective that Aderinoye (2004) views literacy from its holistic nature as “a catalyst for participation in social, cultural, political and economic activities, and for learning throughout life”. UNESCO (2015:7) reviews the functions of literacy and issues in which literacy could be applied and provides a comprehensive definition of literacy as follows:

Literacy is a key component of adult learning and education. It involves a continuum of learning and proficiency levels which allows citizens to engage in lifelong learning and participate fully in community, workplace and wider society. It includes the ability to read and write, to identify, understand, interpret, create, communicate and compute, using printed and written materials, as well as the ability to solve problems in an increasingly technological and information rich environment. Literacy is an essential means of building people’s knowledge, skills and competencies to cope with the evolving challenges and complexities of life, culture, economy and society.

Different scholars in Mbalisi and Eheazu (2016) went further to identify different forms of literacies including among others: alphabetic, technological, computer, environmental, AIDS, cultural, physical, scientific, political, information, technological/digital, financial, administrative, mathematical, visual and health literacies. The United Nations also acknowledges that literacy is critical for promoting and communicating sustainable development and improving the capacity of people to address environment and development issues.

Environmental Literacy

The knowledge of individual adults about their environment will empower them to participate in formulating policies and making informed decisions about their environment. It takes environmentally literate adults to tackle the challenges facing them globally. In line with this view, Dissinger and Roth (1992) define environmental literacy as the capacity to perceive and interpret the relative health of environmental system and take appropriate actions to maintain, restore or improve the health of those systems. Environmental literacy is the ability to acquire

knowledge and understanding of a wide range of environmental concepts, problems, and issues, a set of cognitive and affective dispositions, a set of cognitive skills and abilities, and the appropriate behavioural strategies to apply such knowledge and understanding in order to make sound and effective decisions in a range of environmental context. It is that state in which an individual is environmentally knowledgeable and above all, skilled and dedicated for working individually and collectively, toward achieving and/or maintaining a dynamic equilibrium between quality of life and quality of the environment (UNESCO, 1994).

Miller (2010) describes environmental literacy as the ability to recognize that one's choices affect the environment; to identify the most sustainable solution to a problem; and to be able to act in the most environmentally friendly way on that solution. Gokool-Ramdoos, Ramjaun and Bhola (2012) posited that environmental literacy is a critical tool that usefully helps us understand the power relationships in which we operate, brings forth the realization that we need to develop harmonious relationships with all aspects of our living environment. In effect, environmental literacy helps the recipients to:

- (i) read messages concerning the environment; and
- (ii) take action towards improving both the quality of and our relationship with that environment.

North American Association for Environmental Education (NAAEE) in Danis (2013) presents a new definition of environmentally literate person "as someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies and the global environment; and participate in civic life". According to NAAEE in Dannis (2013), environmentally literate people have various measures of:

- i. knowledge and understanding concerning a wide range of environmental concepts, problems and issues;
- ii. a set of cognitive and affective dispositions,
- iii. a set of competencies (cognitive skills and abilities),
- iv. appropriate behavioural strategies to apply such knowledge and understanding in order to make sound and effective decisions in a range of environmental contexts.

Environmentally literate persons according to Roth (1992) are those who exhibit the following characteristics:

- 1. knowledge of relevant environmental concepts;
- 2. knowledge of environmental issues and problems;
- 3. concern for the quality of the environment;
- 4. environmental sensitivity (feeling of concern for and empathy toward natural areas);
- 5. knowledge of action strategies that may be used for resolving an issue;

6. Beliefs and values (beliefs are what individuals hold to be true, and values are what they hold to be important regarding problems/issues and alternative solutions/actions strategies);
7. skills in using action strategies;
8. commitment to take action; and
9. internal locus of control (the belief and /or feeling that working alone or with other individuals can influence or bring about desired outcomes through his/her actions).

Similarly, Hollweg, Taylor, Bybee, Marcinkowski, Mcbeth and Zoido (2011) gave broader characteristics as they maintain that those who are environmentally literate possess some of the following characteristics to varying degrees:

1. The knowledge and understanding of a wide range of environmental concepts, problems and issues;
2. A set of cognitive and affective dispositions;
3. A set of cognitive skills and abilities; and
4. Appropriate behavioural strategies to apply such knowledge and understanding in order to make sound and effective decisions in a wide range of environmental contexts.

Abiolu and Okere (2011) emphasize that environmental literacy is a goal of environmental education. Environmental education according to Stapp, Havlick, Bennett, Bryan Jr, Fulton, MacGregor, Nowak, Swan and Wall (1969:34) is “education aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve the problems and motivated to work toward their solutions.” The goal of environmental education according to UNESCO (1977) is:

To aid citizens in becoming environmentally knowledgeable and above all, skilled and dedicated human beings, willing to work individually and collectively toward achieving and maintaining a dynamic equilibrium between quality of life and quality of the environment. This means that knowledge, attitudes and skills are what empowers people to change their behaviour towards the environment and hence motivate them to be committed in engaging in actions (either individually or collectively) directed towards achieving environmental protection. Any knowledge, attitude and skills developed in a person must be demonstrated in observable forms through embarking on actions that would lead to the preservation, maintenance and protection of environmental quality, hence sustainability of environmental quality.

Sustainability of Environmental Quality

UNESCO in Mbalisi (2016) gave a general and holistic conception of environment to mean the sum total of all conditions and influences (physical, biological, social and cultural) that affect the development and life of organisms of this planet. It is a dynamic system in which the sub-systems are in constant interaction with each other and undergoing continuous change. Kerry and Kerry (2007: xii) buttressed this view when they remarked that:

The environment is no longer to be dismissed as some sort of nonhuman world of snail darters and lab rats and abstract measurements of our water or atmospheric quality. It is much, much more. It is what we put into our bodies, and it is what we put into the very things that make our lives possible.

Kerry and Kerry (2007) justified this assertion by expressing that the environment has been viewed as natural resources which are harnessed to feed, clothe, and house rapidly growing populations as well as increase the length and quality of life for hundreds of millions of people. Kerry and Kerry wondered why there has been no question about careless exploitation of these same resources which has begun to threaten the very foundation of human life. Attempts to provide answers to the question led to the idea of sustainability and sustainable development.

Sustainability according to United States Environmental Protection Agency (US EPA) in Theis and Tomkin (2012) encompasses ideas, aspirations and values that inspire public and private organizations to become better stewards of the environment and that which promote positive economic growth and social objectives. Sustainability according to World Commission on Environment and Development (1987) seeks to integrate three dimensions of development which are:

1. economic interests defined as the framework for making decisions, the flow of financial capital, and the facilitation of commerce, including the knowledge, skills, competences and other attributes embodied in individuals that are relevant to economic activity;
2. social dimension refers to interactions between institutions/firms and people, functions expressive of human values, aspirations and wellbeing, ethical issues, and decision-making that depend upon collective action; and
3. environmental aspects which recognize the diversity and interdependence within living systems, the goods and services produced by the world's ecosystems, and the impacts of human wastes.

Sustainability according to Ugwu (2016) is to consume natural resources in a way that it can be replaced or replenished naturally so that the future generation's ability to use them will not be compromised. Sustainability therefore could be seen to mean protection, preservation and maintenance of the continued existence and vitality of environmental resources harnessed to achieve quality living as well as ensuring that facilities and structures established with such resources retain and maintain their quality and usefulness over time in order to serve the same purpose for generations unborn.

Environmental sustainability is a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor diminishing biological diversity. Environmental sustainability connotes the practice of reserving resources for future generation without any harm to the nature and other components of it. This view is

embodied in the idea and philosophy of sustainable development which is defined as “a development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). This implies that economic development meant to satisfy the needs of human society of the present generation must be ecologically viable now and in the long run for the ecological diversity to be used to satisfy the needs of future generations. It is worth noting here that sustainability and sustainable development are in most times used interchangeably.

The quality of the environment will determine whether the resources available for consumption by human societies today will be capable of sustaining the future generation. Environmental quality represents the degree of the health of totality of the environment and the effects it has on the health, comfort and psychological state of the inhabitants. It entails a set of properties and characteristics of the environment, either generalized or local, as they impinge on human beings and other organisms. Sustainability of environmental quality is therefore a state of maintenance of the health, vitality and resilience of the environment for continued provision of its services such as air and water purification, replenishment and stabilization of soil nutrients, stabilization of global temperature, etc. Biologically, it is the maintenance of homeostatic ability of the environment. That is the ability of environment to return to its original and healthy state after a disturbance.

Achieving environmental sustainability translates to the realization of sustainable environment which according to Redeh in Viezzer as cited in Onyenemezu (2016) is one that:

1. does not waste financial resources;
2. does not exhaust natural resources or degrade environmental resources;
3. reduces and protects nature;
4. leverages local resources to satisfy community needs;
5. values domestic work and recognizes gender needs and the different roles of men and women in the implementation of public policies;
6. increases livelihood and income generating opportunities for everyone;
7. seek to diversity local economies;
8. protects the health of its inhabitants placing emphasis on preventing medicine;
9. promotes universal access to public transportation;
10. ensures food security and supply for the population;
11. guarantees and improves education, training and recreation opportunities;
12. preserves historical patrimony and local culture; and
13. guarantees society’s participation in decision making process.

Environmental Literacy and Sustainable Environmental Quality in Nigeria

Many environmental problems faced in Nigeria today is an indication of lack of environmental literacy by a majority of the population of the country. Illiteracy on environmental issues and

problems constrains the citizens to perceive the environment just as a resource that should be harnessed to satisfy human needs. With this perception, there is no commitment from anybody or group of people to the protection of the environment. Nobody bothers to ask questions about the consequences of unfriendly environmental activities which have grievous impacts on both the environment and human life. This lackadaisical attitude made people including organized organizations to explore, exploit and utilize environmental resources as they wish without caring about the consequences of their actions on the environment and the resultant impact on human life.

In Nigeria, people either directly get involved in or encourage activities that impact negatively on the quality of the environment. Such activities include burning of bushes and tyres, illegal sand mining, littering and dumping of wastes in drainages and open places, illegal oil bunkering and refining, use of all manner of power generating sets, inability to service and maintain automobiles and driving of vehicles that are no longer road worthy, building of houses on water ways, open advertisement, etc. These activities have resulted in series of grievous environmental problems such as pollution of land, water, and air, erosion, flooding which have rendered many people homeless, hungry, thirsty, and even have led to the death of many due to outbreak of infections that attack human organs and systems.

These issues and problems necessitate the need for environmental literacy through which the citizens of the country could acquire awareness and knowledge of environmental issues and problems in order to change their attitudes towards the environment and consequently have a change in their behaviour that will result in always engaging in responsible environmental actions. Considering the urgency of developing environmentally literate citizenry, a three-pronged formal, non-formal and informal approaches could be adopted in order to commence immediate action in salvaging the Nigerian environment. These approaches are very important in order not to leave any segment of the population behind in efforts towards protecting, preserving and maintaining the quality of Nigerian environment.

In formal approach, pupils and students from pre-primary schools through secondary school to university levels should be targeted with environmental concepts, issues and problems infused and inserted into their curricula to develop in them appropriate knowledge and skills required for addressing and solving environmental issues and problems respectively. It is on this account that Eheazu (2016) suggests that a variegated curriculum will be necessary to get humans to understand and effectively undertake actions towards solutions to environmental challenges at their individual and collective levels of environmental knowledge and skills. Such curriculum, according to her, would be designed to promote knowledge, skills, commitment and conduct of individuals towards environmental sustainability. Infusion and insertion strategies to environmental education should be complemented with developing and offering environmental education as a “distinct discipline or course” at the primary, secondary and university education levels. This suggestion arises out of Mbalisi (2008) claim that only a small percentage of the

time and resources for teaching and learning is devoted for teaching, learning and studying environmental issues and problems infused or inserted into other subjects and this makes it difficult to equip the students with necessary knowledge and skills required to becoming environmentally literate. UNESCO (1997) also identifies demerits of infusion and insertion (subject-mix approach) strategies to environmental education to include the following:

1. non recognition of environmental education as an area of practical activities;
2. transmission of knowledge rather than critical examination of environmental problems;
3. lack of promotion of practical solutions; and
4. content of teaching and learning are hardly adequately linked to the immediate environment of the participants.

From these demerits identified above, one may be tempted to state that the students may feel that environmental issues and problems introduced to them may have come in passing and therefore may not pay adequate attention in order to understand the causes and effects of such issues and problems. With this type of perception, adequate knowledge and skills that will make them become environmentally literate may not be acquired by them. But, the distinct course develops specialists with in-depth knowledge and skills in environmental issues and problems that would lead to actions or activities for protecting and sustaining environmental quality in Nigeria. Such actions and activities may include lobbying for pro-environment legislations and policies, campaigns against biodiversity destruction, littering, deforestation, pollution, bush burning, illegal mining of resources, etc. Other activities include organizing rallies, conferences, seminars, workshops, television and radio talk-shows, etc meant for the purpose of awareness creation and advancement of the understanding of the populace in environmental issues and problems.

In non-formal approach, adults in different sectors of the economy who play various roles as managers, directors, policy-makers, teachers, traders, parents, farmers, artisans, employees are targeted and educated on their contributions through their actions, to series of environmental issues and problems in the country. Knowledge of action strategies and skills for taking actions that can lead to environmental protection will be developed and imparted in them to enable them engage in immediate actions towards ensuring the sustainability of environmental quality. Such education in non-formal approach is possible through conferences, workshops, seminars, town hall meetings, symposia, etc.

In informal approach, the generality of the population is targeted through the media where knowledge of environmental issues and problems is disseminated through organized discussions, chat shows, jingles and advertorials, announcements, etc in radios, televisions, newspapers, social media (facebook, tweeter, Instagram, whatsapp, etc), authored books, billboards, rallies as well as through inter-generational learning etc.

The three approaches discussed above are capable of salvaging the Nigerian environment through the achievement of the following among other feats:

1. development of specialist personnel with in-depth knowledge and understanding of environmental issues and problems;
2. development of environmentally literate citizenry;
3. getting people aware of the consequences of their actions on the environment;
4. developing in people relevant skills for solving environmental problems;
5. educating people on appropriate strategies for sustainable use of environmental resources;
6. reconnecting people with nature.

CONCLUSION

Myriads of environmental problems experienced in Nigeria can only be achieved through making Nigerian citizens become environmentally literates. Environmental literacy is achieved through environmental education which takes place in formal (primary, secondary and university), non-formal and informal contexts. With these feats in mind, environmental education offered through these platforms for the purpose of achieving environmental sustainability should be taken seriously by all stakeholders (government, educators, and the general public).

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