



### MITIGATING THE IMPACT OF CLIMATE CHANGE FOR SUSTAINABLE DEVELOPMENT: THE ROLE OF ENVIRONMENTAL ADULT EDUCATION

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#### Abstract

The rising cases of environmental challenges resulting from climate change in the global space has become very worrisome. With the alarming rate of oil spillages leading to land and water pollution and degradation; population explosion, carbon emission, wide spread ecological ruin and Ozone layer depletion resulting from world-wide duplication of industrialized patterns of production and consumption which involves the use of fossil fuels that release chlorofluorocarbons (CFCs) into the atmosphere; deforestation and desertification; the situation will be worse than we can imagine if concrete actions are not taken. This paper Xrays the impacts of climate change and the role of man as a contributing factor. It established that Environmental Adult Education (EAE) is a veritable tool in mitigating these impacts for sustainable development. EAE through its platforms – formal, informal and non-formal programmes – addresses these issues of environmental problems and the activities of man in his quest for development and survival. Hence, creating the much needed environmental awareness, knowledge, skills and attitude for self and group commitment to environmental safety and sustainability. The paper concluded that since humans have failed in their responsibilities toward environmental sustainability in their quest for better living standard due to ignorance, every man must learn (environmental education) to live aright by respecting the environment / nature and live in a sustainable manner while trying to satisfy or improve his immediate needs.

#### Keywords

Climate Change, Adult Education platforms, Environmental Impact, Environmental Adult Education and Sustainable Development.

#### Introduction

Climate change as a looming environmental threat endangers not only all of our ecosystems, nations, communities, socio-cultural and economic stability but the future and life-wire of our entire human race. The gross impacts of global warming occasioned by climate change and other environmental challenges are differentiated across time and space, regions and nations. The hardest hit are the geographically and economically vulnerable communities in the Sub-Saharan Africa, which have little resources and least access to support, technology, basic social amenities and financial power to respond to impacts of climate change. In the case of Nigeria and the coastal region of Niger Delta in particular, these vulnerable communities

are very prone to sea level rise, flooding, erosion, pollutions, diseases, and after extreme weather events. These areas are often home to the most destitute people, such as fisher folks, peasants, rural farmers, indigenous people, nomads and the urban poor. According to Assessment report of the governmental panel on climate change, by Building Nigeria's Response to Climate Change (BNRCC) project 2011, Nigeria and all the countries within Sub-Saharan Africa are highly vulnerable to the impacts of climate changes.

The desire to help alleviate environmental changes and challenges of these people and communities for sustainable social transformation is viewed as a platform to employ Environmental Education (EE) programmes for adult population

via Environmental Adult Education (EAE). The adults as socio-economic, political, cultural and otherwise work-force in human environment are expected to initiate development process in their various environments for the ultimate purpose of improving their living conditions and environment. The focus of EAE, as an educational programme for adults (who constitute the communities total workforce or change agents) is to help them acquire relevant environmental functional knowledge and skills as well as positive changes in attitude and character reformation which will enable them to be key players in stimulating the desired sustainable actions necessary for sustainable development. Since community development is a process of conscious sensitization and conscientization of a people, it is geared towards helping them discover their individual potentials and stimulate their enthusiasm in the development process. This is aimed at improving themselves and their communities, as well as mitigating the impacts of climate change for sustainable development of their communities through EAE programmes. This paper looks at the concept of climate change and environmental adult education, impacts of climate change, the consequences of human activities and the need for environmental adult education.

### **Concept Of Climate Change And Environmental Adult Education (EAE)**

Climate change as a global reality is the latest human challenge in the socio-economic and sustainable development of nations. It is a global phenomenon which transcends all cultures and space. It is thus, an issue which requires global and local actions / approach. Since it is a respecter of no international borders, it directly affect global sustainability, livelihood and man's ability to coexist harmoniously with the ecosystems / natural environment. Climate change is an alteration of the earth's general weather conditions, a significant and lasting change in statistical distribution of weather patterns over a period of time. It involves patterns of temperature, humidity, wind and seasons (Mbalisi, 2016). Today, Climate change is having its fair share of negative impacts on development efforts of nations as well as in the attainment of Millennium Development Goals (MDGs) especially in developing countries of Africa. If not given proper or desired attention, it may lead to more

environmental / ecological disaster that we can only better imagine, reduce the availability and quality of water, food crops, air and total life expectancy. It is likely to become a major driver of increased human conflict due to extreme hunger and poverty (Building Nigeria's Response to climate change (BNRCC) project, 2011).

Because climate change has been seen as a significant change in weather conditions over time, whether due to natural variability or as a result of human activities, the global concern is now focused on climate change resulting from human actions and specifically from the release of Carbon dioxide, Chlorofluorocarbons (CFCs) and other green house gases to the atmosphere due to industrialization, urbanization and other socio-economic engagements of man. In the local communities, the burning of bushes, fossil fuel deforestation, illegal oil refineries and other unsustainable socio-economic activities of man are major sources of greenhouse gas emission in this part of the globe. Based on this, climate change is seen as a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time period. (United Nations Framework Convention on Climate Change 2017).

Emphasis is now on man as the major contributing factor to climate change due to his constant interactions with his environment for survival from conception to death. Hence the need for environmental education for adults, who constitute greater percentage of the global active population. This Environmental Education (EE) for adults got a boost at the global stage following the 5<sup>th</sup> (United Nations Economic Scientific and Cultural Organization's (UNESCO's) conference of 1977 held in Hamburg, Germany. The conference, among other things, ended with a declaration titled "The Agenda for the Future". The Declaration was clearly directed to EAE when it specified as follows:

*...Education for environmental sustainability should be a lifelong learning process which recognizes that ecological problems exist within a socio-economic, political and cultural context. A sustainable future cannot be achieved without addressing the relationship between environmental problems and current development paradigms.*

*Adult environmental education can play an important role in sensitizing and mobilizing communities and decision makers towards sustained environmental actions (Eheazu, 2013:26).*

Adults are critical stakeholders in the socio-economic, political, cultural and otherwise development of a people and also part of the target group for EE. They are the learners in EAE platforms. EAE which is simply seen as EE for adults, is the application of the theories, principles, programmes, methodologies, approaches and resources (human and materials) of Adult Education (AE) in educating adults about the environment and its associated resources with the conscious intention of developing in them knowledge, attitudes and skills required to generate a sense of responsibility and commitment towards resolving present environmental problems and preventing future ones (Mbalisi, 2016). In his submission, Eheazu (2013) states that EAE is a process of developing in adults (by whatever criteria they are identified), certain attitude, skills and knowledge that will enable them to successfully interact and live in harmony with the forces and elements that surround them, as they engage in their daily activities for survival. Considering the blend of EE modus operandi with those of AE, Sumner (2013) defines EAE as hybrid outgrowth of the environmental movement and adult education, combining an ecological orientation with a learning paradigm to provide a vigorous educational approach to environmental concern. The primary aim of EAE is to develop in adults environmental ethic anchored on ecological stability, quality of the life and the need to safe-guide future generation. Hence, with appropriate environmental adult education programmes, learners are adequately equipped with the functional knowledge and skills for eradicating the impacts of climate change. Thus, providing connection between the economy and the environment.

### **Impacts of Climate Change in the Nigerian Society**

Nigeria is already under pressure from climate challenges and is highly vulnerable to the impacts of climate change. These impacts are expected to increase in the year ahead. For instance,

the growing demand for food, water, fossil fuel and timber in the past twenty-five years or so, has caused serious changes in the country's ecosystem, sometimes leading to drought and desertification in the semi-arid states. It has also caused flood and erosion in the south eastern states. (Eheazu, 2013). A recent report suggested that, in the absence of adaptation, climate change could result in a loss of between 2% and 11% of Nigeria's GDP by 2020, rising to between 6% and 30% by the year 2050. This projection is as a result of a wide range of climate change impacts affecting all sectors in Nigeria; agriculture (crops and livestock), fresh and coastal water resources, forest and biodiversity, health and sanitation, human settlement and housing, transportation and communication, industry and commerce, energy and disaster, migration and security, livelihood, vulnerable groups and education (Francis, 2014). Illegal fossil fuel exploration and exploitation has occasioned oil spillages which have wrecked havoc on the aquamarine environment of the country, especially in the Niger Delta Region, resulting to land and water pollution and degradation. These events have led to famine and wide spread disruption of socio-economic, political, cultural and otherwise well-being of some groups and communities in Nigeria.

The overexploitation of land resource including forest, increase in population, desertification and land degradation pose additional threats (UNDP, 2006). As a result of global warming, the climate in Nigeria is predicated to become more variable, and extreme weather events are expected to be more frequent and severe, with increasing risk to health and life. According to UNFCC (2017), future sea level rise has the potential to cause huge impact on the Africa coastlines including the already degrade coral reefs on the Eastern cost. National communication of UNFCC, indicated that the coastal infrastructure is 30% of Africa's coastal countries including the Gulf of Guinea (of which Nigeria is a big player) is at risk of partial or complete inundation due to accelerated sea level rise. This is also a threat to lagoons and mangrove forest of both eastern and western Africa and is likely to impact urban centers and parks (DVV, 2011)

### **Man as a Contributing Factor to Climate Change**

The utilization of natural resources and constant interaction with the forces, elements and factors of the environment by man, have yielded not only man's desired outcomes, but also harmful results that threatens the survival of plant and animals species as well as the very existence of man himself. The influence of man's ignorance on the dangers of his actions on the earth's fragile ecosystems in his quest to maintain certain perceived comfortable lifestyle has seriously depleted the environment. These human influence are said to be primarily responsible for the present day environmental crises. Rao as cited in Nzeneri (2013:74) affirms that:

*The living conditions today have surely improved a great deal due to industrialization and urbanization, but only at the cost of environmental degradation. The resources are not only getting depleted, but are hazardous and the air is getting filled with pollutants due to high consumption of fossil fuel....we have been creating toxic chemicals which destroys the environment and us.*

In the process of struggling for better living conditions, human beings have in various ways made the environment more hostile than they met it. It is very clear, that man has been made aware of the harmful effects of the over-growing incidence of environmental deteriorations caused by his own actions and to which he is exposed to several health and environmental dangers. Some human induced environmental problems that contribute to climate change include:

❖ **Deforestation:** This is a deliberate removal of forest and other forms of vegetative covers from a site without replacement. It is the alteration of natural arrangement of plants, a process of depleting without reforestation. This action may be for the purpose of creating new agricultural or urban centers, to provide food, water, wood for fuel, building and manufacturing industries. Beazley as reported by Nzeneri (2013) maintains that in the tropics, treat is more direct since millions of square kilometers of forest are being cut down, flooded or burned each year as forest are felled for timber, cleared for agriculture or converted into enormous reservoirs through the damming of rivers.

❖ **Pollution:** The major sources of pollution

are from industrial activities, large scale bush burning, gas flaring, uranium or nuclear weapon explosions, combustion of fuels for heating and energy production, solid waste disposal facilities, automobiles and industrial plants to mention a few. The most widespread pollutants and those which have received the most attention at global discuss include carbon monoxide, hydrocarbons, lead, nitrogen oxides, photochemical oxidants, sulfates and sulfur oxide (Nzeneri, 2019). These toxic chemicals are the most contributing gases to climate change.

❖ **Waste Generation, Management and Disposal:** Environmental Problem of this nature is associated with man's poor commitment to environmental quality, beautification and sanitation. The word "waste" refers to unusable, useless, unwanted, worthless or discarded materials. This waste comes in form of solid, liquid or gas. In whatever form waste is classified, the common issue is that it is due for disposal. For man to live in a habitable environment, he must find ways of getting rid of waste in a more efficient, safe and hygienic manner. According to Nzeneri (2019) the dumping of 10,000 drums of hazardous waste at Koko in Delta State, Nigeria in 1988, created great awareness on the challenges of waste mismanagement, unsafe disposal and its health implications to Nigerians and Nigeria. Though this awareness short lived, many have advocated for the need for environmental education so as to reinvigorate the awareness that awakened Nigerian consciousness to environmental safety and quality. There is need therefore, to involve critical stakeholders in this campaign to help in reducing the consequences of improper waste management and disposal which can result to;

- Provision of good breeding ground for disease vectors;
- Pollution of available streams / rivers for drinking and for other domestic purposes;
- Increase incident of infant / child mortality
- Loss of aesthetic or beauty of the environment,
- Loss of natural habitat when toxic waste is dumped in the forest reserves or aqua marine environment.

Other human induced environmental actions are

population growth and explosion, flooding and erosion.

Many factors compound the impacts of climate change variability in Nigeria and inped on the country's ability to cope with the challenge. The compounding factors include poverty, illiteracy, lack of functional skills, weak institutions, limited infrastructure, lack of technology and information, low levels of primary education and health care, poor access to resources, low management capabilities and armed conflicts.

### **The Need for Environmental Adult Education**

In view of the ugly consequence of man's constant interaction with his environments, as already highlighted, it becomes very pertinent at this point to showcase the need for EAE in mitigating the impacts of climate change for sustainable development. The need for environmental safety and awareness, therefore, is to develop people's consciousness in building a strong, reliable and sustainable environmental system that is capable of sustaining all human developmental activities. EAE enables mankind to perceive the environment as her health, wealth and responsibility. To achieve this, the Belgrade charter of 1977 on a global framework for environmental education spelt out the need to;

- Create awareness of the interaction and inter-dependence between living organisms and their surroundings.
- Provide individuals with adequate information in managing their environment as well as information on water pollution and the effects of destruction of wild life habitat.
- Provide basic concept of problems related to philosophical growth, standard of living and responsibility of individuals and societies towards environmental cleanliness.
- Provide skills in the management and evaluation of ecological problems
- Promote and raise the citizen's consciousness on environmental education and the problems of environmental pollution as well as its repercussions.
- Help individuals and groups acquire social values, strong feeling of concern

for the environment and the motivation for actively participating in its protection and improvement.

- Help individuals develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems.

EAE provides an opportunity for various categories of adults to be environmentally sensitive, knowledgeable and skilled, develop appreciable environmental attitudes and values, personal responsibility and environmental culture for active involvement in environmental safety. The primary goal of EAE is to develop a globally eco-friendly and competent individuals (adult work-force) who are aware of, and concerned about environmental safety and its associated problems.

EAE is seen as education for survival of all-humans, flora and Fauna as well as the ecosystems. It is that education which develops critical awareness and understanding of the environment on the part of adult individuals (learner), and empowers them with the desirable and functional skills, knowledge, ideas, attitude, behaviour and the like to enable them interact freely and relate successfully with the environment (Nzeneri, 2013). The major objective of EAE is to mobilize, sensitize, re-orient and change the adult learner's mind set, concepts, ideas and behaviour toward respecting and appreciating the environment for sustainable development. As a discipline, EAE adopts all of the platforms of adult education – formal, informal and non-formal. According to Nzeneri (2012:7), “Adult education, in its ramification, accommodates all of the forms-formal, informal and non-formal aspect of education.” The author indicates that, it is in adult education that greatest emphases are placed on life-long education, education as process and agent of liberation, a tool for adjustment, for self and national development, for cultural awareness and integration, for conscientization and group dynamism. This is true of EAE, it is systematically organized and consciously planned programme of activity whether within or outside the conventional school system depending on the categories of adult learners.

❖ **Formal EAE Programme:** It is consciously planned and systematically organized programme of

activity, this form of EAE is usually undertaken by social agents of education such as the schools, colleges, polytechnics and the university. It is hierarchically graded into various levels with the aim of training and enhancing Human Resources Development (HRD) (EAE experts / resource persons) for sustainable capacity building and information for responsible environmental actions / behaviour. In the formalistic sense, Okafor (1987) and Nzeneri (2012) noted, that the concept of teaching (act of transmitting knowledge, attitude and skills to the learner) and discipline (introducing the learner to the moral life of the society) are employed.

❖ **Non-Formal EAE Programme:** This is an organized form of EAE programme outside the formal school system. It is mostly organized within an operational work environment such as an apprenticeship system and on-the-job training whereby persons already on the job, develop their abilities, enrich their knowledge, improve their technical or professional skills and qualifications to bring about immediate adjustment to and management of environmental changes and challenges within their occupational environments. This form of EAE accommodate all adults (economically active groups) irrespective of their levels of education and literacy. It could be organized in forms of workshops, seminars, conferences, field trips, exhibitions and public enlightenment aimed at enhancing the learners' functionality, skills and competences with respect to environmental protection and occupational safety. The methods of Non-formal education are more dynamic or flexible, problem oriented, learner-centered, pragmatic and practical. It covers all out-of-school environmental adult education programmes.

❖ **Informal EAE Programme:** This form of EAE is associated with incidental or accidental learning. In this case environmental knowledge and skills are gained through listening to media, private reading, conversation, ritual and or ceremonies, storytelling, songs, proverbs, recitation and skills demonstrations. Since everyone can learn unconsciously about the environment, from the environment and for the environment; the informal platform, accommodates not only the adults but also youths and children. Because life is not

compartmentalized, education involves an integrated experience. Thus, base on life experiences, man learns to improve on ways / patterns of doing things / interacting with the environment better, best and sustainable. In all, learning about the environment and EAE is a lifelong process.

### **Scope and Objectives of Environmental Adult Education**

The scope of EAE is summarized in its definition made at the Intergovernmental Conference of Environmental Education held in Tbilisi, Georgia, USSR, between 14<sup>th</sup> and 26<sup>th</sup> October, 1977, The conference report which is generally referred to as the UNESCO / UNEP Tbilisi Declaration of 1977, defines EAE as a learning process that increase people's knowledge and awareness about the environment and associated challenges develops the necessary skills and expertise to address the challenges, and foster the attitudes, motivations and commitments to make informed decisions and takes responsible action. According to Eheazu (2013:28), in view of the tremendous environmental impacts of 20<sup>th</sup> century globalization, especially in the use of polluting fossil fuels, the scope of EAE has expanded to include development of the following traits among adults:

- Knowledge of environmental problems and their solution
- Skill to engage in social activism to combat those problems
- Attitude of respect and connection to the natural world.
- Desire to change current practices to protect the earth.

Accordingly, the objectives of EAE in line with the expectations of the Tbilisi Declaration could be specified to include:

- Inculcate in adults the knowledge and understanding of their environment and the natural and man-made factors that contribute to its deterioration;
- Help – the adult population to identify the socio-cultural, political, psychological, chemical, biological and other elements that pose dangers to their day-to-day living;
- Develop appropriate curricula for the

environmental education of adults which would reflect the circumstances and desirable actions for effective environmental management and harmonious relationship with their environment;

- Plan appropriate action programmes for mobilization of adults towards improvement of environmental quality and personal environmental aesthetic values;
- Promote the practice of sustainable development among adults through non-formal environmental education programmes in relevant fields of the adults' socio-economic endeavours;
- Help adult citizens to acquire knowledge and skills useful for their understanding and avoidance of environmental abuses.
- Help adults to acquire basic conceptual knowledge of causes and effects of environmental challenges and their solutions (Eheazu, 2013, 29).

In pursuing these objective, Clover (2003), laid strong emphasis on the participatory approach or method of delivery which allows adult learners to make connections between social and environmental issues. It therefore, becomes imperative to reawaken adult learners' environmental consciousness and commitment to sustainable occupational practices and engagements. With this, they do not forget their dependency on and relationship with, the natural environment and their responsibilities towards a better, sustainable and progressive society / environment

## Conclusion

Obviously, the impacts of climate change have caused huge damage not only to the aqua-marine environment in the Niger Delta, flood and erosion, drought, desertification and deforestation in other parts of the Nigerian society but also pose serious threat to man's life support system / resource base and to his own existence as well. Undoubtedly, the interactions between man and his environment in his quest for development and survival have contributed significantly to these challenges. Hence the major cause of environmental degradation and

increasing incidence of various related environmental catastrophes. To change the narrative, a global concern for environmental education and awareness was initiated by UNESCO/UNEP in 1977. The need for environmental education for adults, who are the most active group of the human population becomes very necessary, making them to understand the implications of their activities on the earth's environment, equipping them with the requisite functional skills and knowledge to actively participate in promoting, protecting, managing and sustaining environmental resources for future generation. The roadmap of EAE in the fight for sustainable development can only be achieved when a good percentages of our adult population becomes environmentally literate, pro-active to environmental issues and exhibits high level of eco-friendly behaviour and actions to mitigate environmental challenges.

## Recommendations

A lot needs to be done to bridge the lingering environmental challenges. Environmental adult educators and experts should design better and flexible strategies / teaching methods that would create lasting positive impact on the minds of human begins in relation to environmental protection.

Learners should be made to understand that humans live, move and have their being within the environment. Therefore, any action and / or inaction that fails to protect the environment becomes a potential threat to humanity. Hence, the need for environmental preservation and conservation.

Environmental safety trips / education briefings should be conducted every morning before the start of work in all institutions to help keep individuals abreast and in high alert with actions that may lead to environmental challenges.

Environmental bodies / agencies should call on the international community to enact stiffer laws / penalties that will enable nations and multi – national industries to cutdown on their level of carbon emission. The use of renewable energy should be encouraged.

Environmental education should be introduced and taught at all levels and in various forms of educational system – formal, informal and

non – formal to help boost people's environmental awareness and consciousness.

Finally, the ministry of environment through her sister ministry (of education) should develop a curriculum on climate change education for primary and secondary school students.

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