

Developing Climate Change Curriculum For Non-Formal Education In Nigeria

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Abstract

The effects of climate change and the public outcry for a solution demand for the development of a curriculum for non-formal education in Nigeria. Climate change is variability in the atmosphere for a period of 30-35 years on the average. The purpose of this article is to put forward a proposed climate change curriculum for non-formal education in Nigeria. The article examines the conceptual framework on curriculum development, education, non-formal education, climate change, its causes, impact on agriculture, economy, education, human health and weather. Further discussed is the need to include environmental education in the climate change curriculum for non-formal education. The article contained a suggested outline of climate change curriculum, mode of teaching, conditions for implementation and the recommendation that climate change curriculum implementation be urgently attended to by all stakeholders responsible for its full implementation. This is the needed reform in non-formal education for Nigeria in particular.

KEY WORDS: Climate change, curriculum development, non-formal education, impact, Environmental education, .curriculum implementation

Introduction

Climate change is a global phenomenon that needs urgent attention. In clear terms, climate change is “changes in the distribution of weather events around an average of time”. International Panel on Climate Change (IPCC, 2007) Fourth Assessment Report (AR4) equally defined climate change as a change in the mean and /or variability of its properties that persists for an extended period typically decades or longer period, say 35 years. Climate change has brought about negative consequences to human survival. Aniokoye (2007) reiterated that climate change poses a great threat to global environment and equally to long-term national and international development efforts aimed at creating a more healthy, prosperous and sustainable world. Recent studies by scholars such as Buba (2004), (Porbeni (2004), Mshelia (2005), Hengeveld, Whitewood & Ferguson (2005), Derwaerd (2007), Odjugo (2007), Ayuba, Maryah & Gwary (2007) revealed that anthropogenic factors like urbanization, deforestation, population explosion, industrialization, and the release of green house gases are the major contributing factors to the depletion of the ozone layers and its associated global warming and climate change. The on-going climate change and its attendant global warming are expected to cause distinctive climate patterns in different climatic zones which will impact negatively on the ecosystem.

The ravaging effects of climate change on Nigeria according to Odjugo (2007) are quite frightening; as depicted by the menace of desertification in the North, gully erosion in the East, water erosion and ecological devastation in the coastal region and threats on education as well as other areas of development. Banire (2011) observed that 15% of Nigerian population is affected by climate variation and sea level changes. Banire further reported that soil erosion occasioned by the intensity of rainfall is terribly degrading arable lands in the South East, causing gullies and destroying lives and property while the north comprising Katsina, Kano, Kebbi, Zamfara, Sokoto, Adamawa, Bauchi, Gombe, Borno, Yobe and Jigawa states are being ravaged by desertification.

It is a known fact that scientists have high confidence that global temperatures will continue to rise for decades to come, largely due to emission of green house gases by human activities. For instance, the intergovernmental panel on climate change (IPCC, 2007) forecasted a temperature rise of 2.5 to 10 degrees Fahrenheit over the next century. According to the (IPCC, 2007) report, the extent of climate change effect on individual regions will vary over time and with the ability of different societal and environmental systems to mitigate or adapt to change. Consequently, the impact of climate change on agriculture, economy, health, infrastructure, education, weather and the general life of people directly or indirectly, necessitates the development of climate change curriculum for non-formal education in Nigeria is imperative. As Sakio and Ochoyi (2011) observed, the potential effect of global climate change cannot be ignored by countries of the world because of the devastating impact on various dimensions on human endeavour such as education, environment, health and general life in Nigeria in particular and the world in general. Climate change is a global Phenomenon that needs urgent attention. This article therefore, view curriculum development for non-formal education on climate change as timely and should include aspects of environmental education management resources and management of our immediate grounds.

Aims of Climate Change Curriculum Development

Developing climate change curriculum for non-formal education has these main aims:

- Developing awareness among adults and children that are outside the formal education system, and appreciating climate change phenomenon with its pertinent consequences.
- Developing attitudinal change that will help learners to make sound decisions about his immediate environment and how to adapt to meet up with challenges of climate change.

- Providing for learners' preventive measures to man-made forces that are responsible to climate change.
- Identifying causes of climate change in the world, and
- Identifying consequences of climate change.

According to National Teachers' Institute NTI (2008), developing curriculum is the fruitful ordering of subject matter designed to produce knowledge, skills and attitudes in learners. First, our educational process must give the learner the knowledge which he needs either to look for employment or employ others. This enables him to care for himself and care for others. The first and second points mentioned above are relevant for developing curriculum on climate change for non-formal education. That is, the adult learner will adopt the principle of "live and let live". The knowledge gained will also help him to appreciate the entire climate change phenomenon and the work of creation such that he does not abuse it. Above all, this knowledge makes him more aware of himself in relation to his environment in Nigeria and so he protects his own interest and that of others round him.

Education is a continuous and creative process. It is a process of teaching and learning for the development of knowledge and skills that help individual to service his environment (Mohammed, 2009). Combs and Ahmed (1974) in Malgwi and Lessado (2000) referred to Non-formal education as "any organized systematic educational activities carried on outside the formal educational system to provide selected type of learning to particular sub-groups in the population; adults as well as children. These include such as adult literacy programme, agricultural programme, programme of instruction in health education, nutrition, family planning, HIV/AIDS, climate change, environmental education, population education, and so on.

The programme are in agreement with section 7 of adult and non-formal education policy statement, which consists of functional literacy, remedial, continuing, vocational, aesthetic, cultural and civic education for youths outside the formal school system. The national policy of education policy document state five objectives for non-formal and adult education in Nigeria to include:

1. To provide functional literacy for adults who have never had the advantage of any formal education.
2. To provide functional and remedial education for those young people who prematurely dropped out of the formal system,
3. To provide further education for different categories of completers of formal education system in order to improve their basic knowledge and skills; To provide in- service on – the-job, vocational and professional training for different categories of workers and professional in order to improve their skills; and
4. To give the adult citizens of the country necessary aesthetic, cultural and civic education for public enlightenment.

It is necessary if students in the non-formal field are not to feel frustrated that public recognition be given to approved forms of training outside the formal system; certificates be issued to participants at the end of the training. The article discusses climate change under the following sub-topics which include: Conceptual framework, steps in curriculum development process, implementation process and possible suggestions.

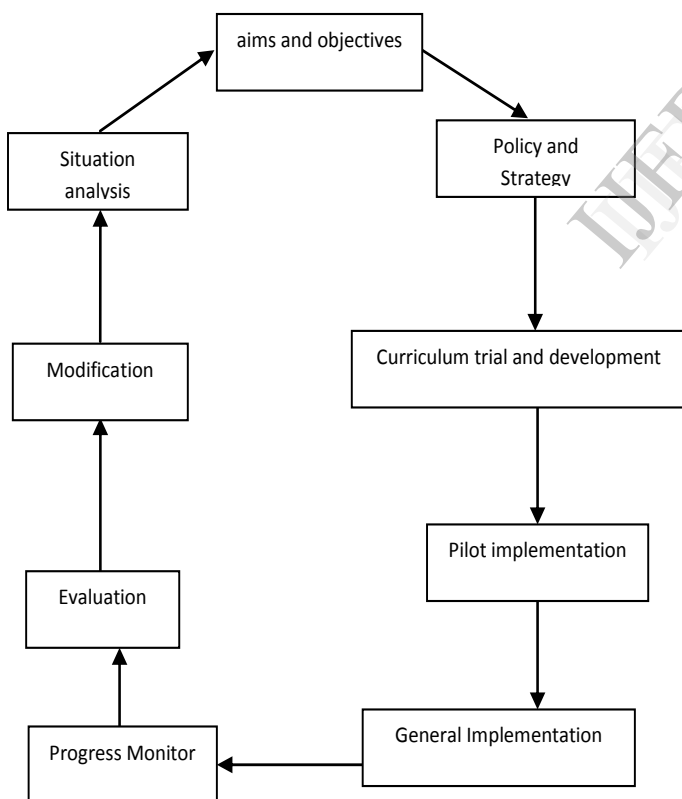
Conceptual Framework

Education is a vehicle for change (Malgwi & Lessado,2000); developing curriculum on climate change for non-formal education ensures change in attitude to environmental degradation, desertification effects deforestation, greenhouse and land use effects and other causes of climate change due to man's actions and behaviour to his environment. The development on climate change for non-formal education is a welcome idea as it is among best global practices to prevent or to reduce effect of climate change on man in Nigeria. Adult non-formal education is a viable means of creating an intellectual climate within which the adult people can consciously engage in informed process of self-development.

Tahir (1991) in Malgwi and Lessado (2000) observes that the views of affected people should be solicited when planning for social change. According to Malgwi and Lessado (2000), a well-coordinated non-formal education programme should do more than solicit. It should invite affected people in the "how" to bring about social change. Discussing the contribution of non-formal education to national development, Obenawa (1984) in Malgwi and Lessado (2000) asserted that the development of a nation means that all able citizens participate fully in its day to day activities. Non-formal education therefore, as defined by Combs and Ahmed in Malgwi and Lessado (2000) is any organized systematic educational activity carried on outside the formal education system to selected types of learning to particular sub-groups in the population; adults as well as children. According to National policy on Education (FGN, 2004), adult and non-formal education consists of functional literacy, remedial, continuing education for youths and adults outside of the formal school system.

Climate change is variously defined by experts in geography, meteorology or environmentalists in the wake of global climate change phenomenon. For instance, Adebayo (2011) defined climate change in a narrow sense as the average weather condition of a place over a long period of time (say, 30 years, according to WMO); climate is never static. Adebayo (2011) further, described climate change as a statistically significant variation in either mean state of climate or in its variability, persisting for an extended period (typically decades or longer). It involves a shift of climatic conditions to a new equilibrium position with values of climatic elements changing significantly.

Ezeji (2011) on the other hand said (climate change is a constant phenomenon.He further affirmed that it is the fluctuation over a period of time, a change in a statistical properties of climate system when considered over a long period of time. Farauta and Apagu (2011) quoting UNFCCC (1992) defined climate change as a change of climate which is attributed directly or indirectly to human activities that alter the composition of the atmosphere and which are in addition to natural climate variability observed over a comparable time periods. Farauta and Apagu (2011) further asserted that climate change are caused by natural processes or external forces due to anthropogenic changes in the composition of the atmosphere or in land use. Sakio and Ochoyi (2011),quoting International Panel on Climate Change (IPCC, 2007) Fourth Assessment Report AR4, defined climate change as in the average weather and /or variability of its properties that persists for an extended period typically decades or longer period of time , say, 35 years. Similarly, Madugu,Ndagana and Badau (2011) define climate change as the distribution of weather events around an average of time, with negative impact on human survival.



Steps in Curriculum Development Process

Curriculum Planning Process, Adapted from Utulu (2010).

Step 1. Situational Analysis

The impact of climate change is one of the factors that have become social and environmental threats facing the nation. It is one of the effects of global warming. According to Ibrahim (2011), understanding the effects of climate change is an essential starting point for discussion on the governance and the environmental sustainability of climate change. Danjuma (2011) argues that the identification and non-inclusion of environmental education in the school science curriculum is one of the challenges in tackling the issue of global warming and climate change in Nigeria. Education being the bedrock of human development unfolds the need for the inclusion of environmental education in the curriculum for non- formal education.

Scientifically, climate change threatens the basic elements of life for people around the world including Africa. It threatens access to water, food, health, the ecology, land use and environment. Climate change occurs when climate variation or fluctuation brings a shift or change in the type of climate change prevailing in an area. There is need for the knowledge of melting glaciers, poor food security, ocean acidification, rising sea level in the south to increased deaths from heat stress and malnutrition, ecosystem vulnerability, species loss, induction of extreme weather and effect of desertification to the north. The above effects and lots more, need critical analysis as well as on level of readiness of the society, quantity of staff for training and funding required before embarking on curriculum development for non- formal education on climate change.

Step 2: Aims and Objectives

What then are the aims and objectives of climate change education? This question must be answered from onset. The knowledge of factors responsible for depleting ozone layers thereby affecting man negatively is studied. Aims of climate change in a non -formal education are to:

- enlighten citizen on causes of 'nature deficit disorder'.
- develop awareness, increase knowledge and build skills to combat climate effects on man and his environment.
- provide environmental education to adults outside formal school system.
- introduce agricultural practices that will make agriculture more robust and resilient.
- Adopt adaptation strategies recommended and practiced in affected regions of Nigeria according to Building Nigeria's Response to Climate Change (BNRCC, 2011).

Step 3. Policy and Strategy

Sakio and Ochoyi (2011) reported that media and television stations showed that efforts have been put in place to combat impact of climate change in the country. For instance, Bent (2011) urged President Goodluck Jonathan to sign climate change commission Bill passed by the National Assembly as a matter of urgency to avoid grappling with climate disasters of the size and proportion that Brazil, Japan and America had in 2011. The fact remains that if climate change issues are handled with levity, we are bound to face the consequences in the nearest future. African Independent Television (AIT, 2011) Guest speaker contended the environmental law should be reviewed, amended and weak laws strengthened to work like the days of **“war against indiscipline”**.

After signing the Bill, Education policy as a strategy is a strategy is the work of the Ministry of Education and climate change commission to collaborate to make it work.

Step 4. Curriculum Trial and Development

This stage called curriculum trial and development will take place at the Nigerian Educational Research and Development Council (NERDC) in collaboration with Climate Change Commission and Federal Ministry of Education. This government agency is responsible for costing, release of fund and monitoring of the implementation and so will also take care of curriculum trial and development process.

Step 5. Pilot Implementation

Curriculum development on climate change for non formal education is an action research that needs to pass through the pilot stage. This stage requires the implementers to carefully select centres, staff and request for fund adequate for pilot testing the implementation process. The reason for this is obvious. That possible problems that will surface during the implementation period will be identified and suggestions or recommendations will be put forth to guide the governments, planners and implementers. All form of challenges ranging from bureaucracy, indifference, corruption to lack of proper training of staff will be properly addressed.

Step 6. General Implementation

General Implementation of climate change curriculum for non-formal education stakeholders; the federal state and local governments, curriculum planners and implementers, teachers and non-governmental organizations as well government agencies such as National Orientation Agency, National Open University of Nigeria and non formal and adult education units. The process of implementation of climate change education will include the following, recruitment of personnel, employment, purchasing of equipment, opening centres and offices for

implementation, training and creating awareness for climate change education. The curriculum document for climate change education is dropped in the hands of all stakeholders for proper and well articulated execution. According to Mkpa (1987), this stage of curriculum implementation has the task of translating the curriculum document into the operating curriculum by the combined efforts of the students, teachers and other personnel concerned.

The stage starts from the period of translating the document to the period of teaching and finally to the time when the entire society will benefit from the studies. When the classroom teachers adopt the appropriate teaching strategies and materials to guide students learning at the non formal level, the society (Nigeria in particular) and the world at large will immensely benefit from such educational venture as ills of climate change effects will be overturned. The teacher is the major implementer of curriculum. The preparation and continuous training of teachers is a welcomed idea.

Step 7. Progress Monitoring

This stage in any curriculum development process is vital to effective curriculum implementation. Educators believe that teachers, supervisors, stakeholders charged with the responsibility of implementing climate change education curriculum for non-formal education such as climate change commission, adult and non-formal education commission as well as government agencies need to be monitored. This will ensure non-diversification of funds, indifference or developing cold feet about the curriculum implementation issue. If climate change education programme be established and proper collaboration between ministries and the commissions take place, there will be a huge success.

Step 8. Evaluation Stage

The evaluation stage as described in Utulu (2010) is the stage of accessing the overall general implementation of climate change curriculum development process as it enable curriculum planners see areas of partial implementation, non- implementation and reasons for such lapses. Identified lapses are promptly given urgent attention in order to ensure proper implementation of climate change of climate change curriculum.

According to Utulu (2010) this type of evaluation is diagnostic and have these benefits. They are:

- It is an effective way of carrying learners and the society along in the curriculum process.
- It helps curriculum planners and teachers identify areas that need improvement.
- Urgency is given to identified challenges in the implementation process.
- Implementation is more systematic and less stressful.

Also, if the identified lapses include lack of funds, materials or teachers' quality/adequacy, then the need to go back to the drawing board for critical analysis and review of all the steps afore mentioned. This leads us the stage called the modification stage.

Step 9. Modification Stage

After all the planning, constructing and development activities that go in the curriculum development process for non formal education on climate change then comes the stage of modification which deals with adjustment and modifications of what went wrong during the period of planning or implement proper. Areas of lack of of fore sight at planning stage and things not well handled such as inadequate staff, inadequate fund, inadequate infrastructure, facilities and materials as well as study centres influenced by political reasons will all be modified at this stage. The cycle will be a continuous process to ensure effectiveness of climate change education curriculum implementation.

Course Content of Climate Change for Non-Formal Education

The following Climate change curriculum is hereby suggested for the non-formal education. These are:

A. Climate Change

- Introduction to climate change
- Natural Disasters
- Emissions
- Ecosystem
- Land use system

B. Causes of Climate Change

- Natural Variability
- Tropical Deforestation
- Use of fossil fuel
- Land degradation
- Agricultural activities
- Desertification
- Land use and land cover

C. Effects of Climate Change

- Effects of climate change on weather
- Green house effect
- Change in ecosystem.
- Effects of climate change on Agriculture
- Effects of climate change on Economy
- Effects of climate change on Education
- Effects of climate change on Health of Humans
- Effects of climate change on Infrastructure
- Floods
- Famine and diseases
- Change in ecosystem

D. Environmental Education

- Need for environmental education
- Sustainable education through environmental education

- Landscaping
- Drainage
- Waste disposal/Dumping of refuse
- Bio-energy production
- Biofuels
- Management of Waste Resources
- Management of Compounds
- **E. Methods of Teaching**
- Exposition,
- Group Discussion
- Laboratory Work
- Simulation and Gaming
- Seminars and workshops
- ICT Soft wares
- Field Trips
- Film/Pictures, and so on.

Conclusion

Curriculum being an instrument through which instructors seek to translate the hopes of its society into concrete reality, involves mapping out step by step what should be covered within a given time and at a certain level of education. The key elements for inclusion in climate change, causes of climate change, effects of climate change, environmental education and so on. Climate change curriculum for non formal education is a new corner in Nigeria educational systems. The development for non formal education and its implementation is something that follows a carefully planned procedure in order to achieve its peculiar objectives. Utulu model steps in curriculum development is recommended for climate change curriculum development for non formal participatory teaching learning approach is recommended for climate change curriculum development.

Recommendations

These recommendations are suggested; which include:

1. Introduction of climate change and environmental education sensitization and teaching specific competencies, through pre-service and in-service trainings
2. Climate change and environmental education dialogues should involve not only policy makers but also all stakeholders of climate change,
3. Climate change education should be integrated into the institutions as a matter of urgency,
4. Climate change curriculum for no formal education should be studied standalone or integrated into other courses
5. Promote research to enhance the knowledge base on climate change
6. The recommended teaching and learning methods should be lectures (including quest lectures, seminars, group discussions, visit sites, demonstrating the impact of climate

change/adaptation and mitigation work progress, on farm discussions and surveys.

7. The use of public enlightenment campaign about the causes, consequences and effects on the society be intensified through various media and National Orientation Agency (NOA),
8. There should be a wide range of public awareness at all levels through the use of posters, fliers and handbills, and so on, since the informed public will make wiser and more accurate decisions and responses to climate change issues.
9. The Federal Government of Nigeria is to engage on aggressive environmental education awareness campaign on
10. Individuals should be educated to adopt carbon-dioxide reductions strategies by taking such steps as turn down heat as reducing the temperature by 1 degree centigrade, choose low energy models (energy saving bulbs), and plant trees around one's house/school to assist combat environmental degradation.

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