



CLIMATE CHANGE: THE STRATEGIC PLACE OF PRIMARY AND SECONDARY SCHOOLS EDUCATION IN CURBING ITS EFFECTS IN NIGERIA

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ABSTRACT: Climate change is real; its effects are being felt all over the country. A lot needs to be done to increase awareness through primary and secondary school education. Although it's a relatively new concept, the present National policy of education at the primary and secondary school level has a wide range of subjects that could be used to create more awareness, create innovative idea and help improve the environment. At the primary and secondary school level, Nigeria's vulnerability to climate change effects and mitigation strategies would form the fulcrum of reaching out to the wider populace on key approaches to adopt in mitigating the effects of climate change in Nigeria and reduce emission of greenhouse gases.

Keywords: Climate change, primary education, secondary education, mitigation, effects, awareness;

INTRODUCTION

Climate change is defined as the collective changes in climate that is attributed to the resultant effects human activities which alters the present composition of the overall atmosphere. It could also be referred to as global warming. Olaniyi, O. A, Funmilayo, O. A and Olutimehin, I. O (2014) opined that climate change is synonymous to an increase in average global temperature caused by natural and human activities. These human activities increase greenhouse gases such as carbon dioxide (CO₂) and methane in the atmosphere leading to a phenomenon called the "greenhouse effect". These greenhouse gases tend to blanket the earth enveloping massive energy around the atmosphere, this leads to the earth having higher temperature. Since the industrial revolution, the average global temperature has been on the rise as a result of various human activities like fossil fuels burning, bush burning, deforestation, waste burning. The direct effect of such

rise in temperature (global warming) is what is referred to as climate change. Furthermore, scientist have established a greater relationship between human' increased levels of carbon emission into the environment and the intensity of global warming. (The Guardian 2019). Generally, climate change is seen as the alterations, disruptions in the normal atmosphere that are more than the natural climatic variations and are stirred by human activities. Usually such human activities are indiscriminate, unplanned and are not environmentally friendly and sustainable. These lifestyles can be refined, planned, well guided through well-structured and purposeful and environmentally friendly education and public enlightenment.

Climate Change Model

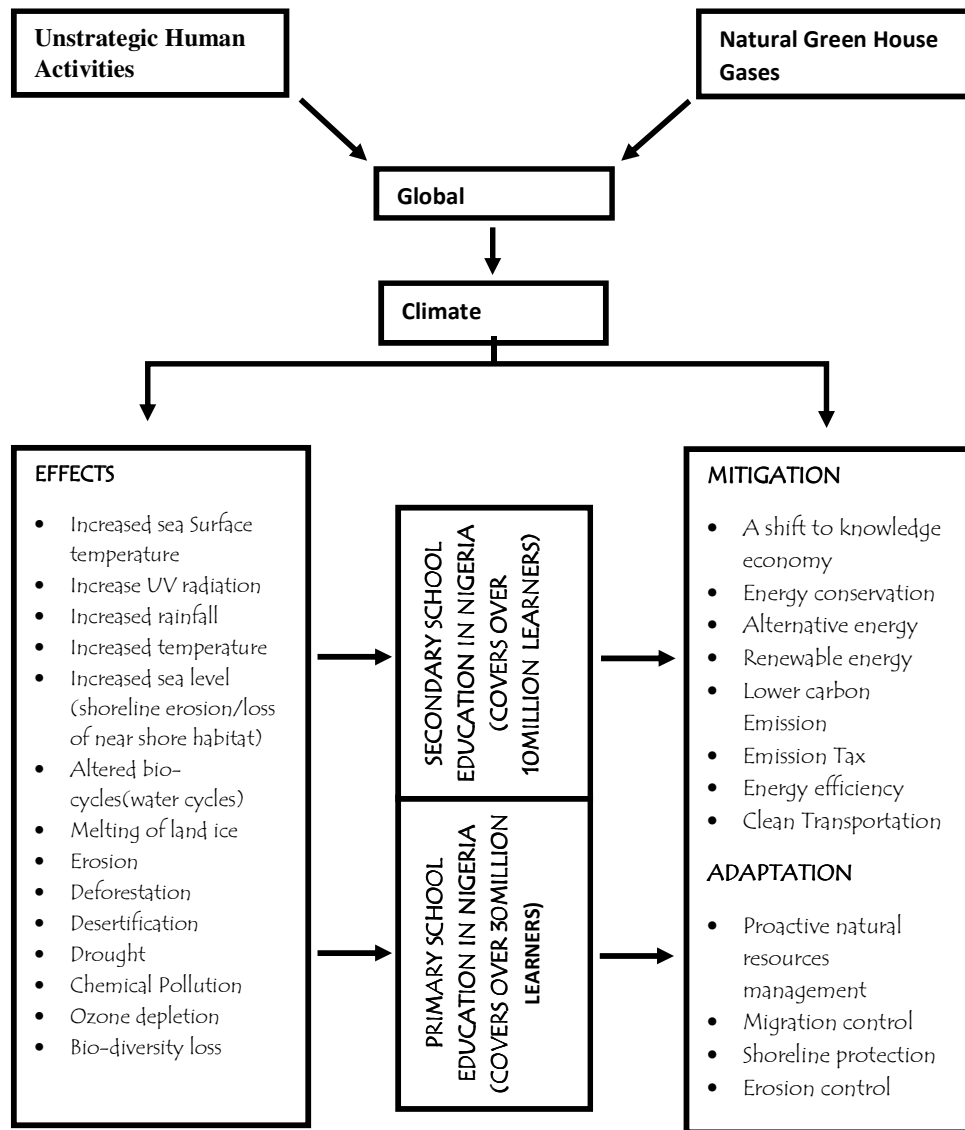


Figure 1: Climate change model.

Source: Author

Effect of Climate Change in Nigeria

Nigeria is presently experiencing the adverse effects of global and regional climate change, among others are off season rains; flooding across the country due to higher rainfall, blocked drains, across the country, drought in the core north leading to herdsmen cattle

migration with its resultant effects of herders-farmers clashes across the country and loss of lives and properties; declining agricultural. These unpredictable variation in weather "climate change" could lead to increase in heat-related mortality, spread of communicable diseases, dehydration, malnutrition, destruction of health facilities. Destruction of natural ecosystem and habitat due to deforestation, pollution, degradation; meaning that agro-related businesses would suffer losses, food shortage, slow down of agro-based industrialization efforts

Scarcity of fertile land and violence at the hands of Boko Haram jihadists in the north of Nigeria are driving thousands of people southwards, dividing the country down ethnic and religious lines. Thousands of people from the roaming Fulani ethnic group are reported to have fled south this year, running up against Christian crop farmers, who accuse the Muslim herdsmen of violence against villagers.

Much of the fighting is understood to stem from conflict over resources such as land and water, which have become increasingly scarce in Africa's most populous nation. Clashes are reported to have intensified over the last few years.

Rise in sea Level: The present global estimate of sea-level rise is 0.2 Meter; the implication of this is that the coastal regions of Nigeria is under severe threat of costal erosion meaning that Niger-Delta areas like Lagos, Bonny, Calabar, Port Harcourt, Forcados, Warri, Eket, Bayelsa which are less than 10 Meter above sea level are likely to have impactful environmental problems of saltwater intrusion into fresh river water, water overflowing of its shore, destruction of mangrove tree ecosystem and subsequent population displacement.

Flooding: Flooding is becoming more prevalent in Nigeria resulting in deaths and loss of properties, farmlands Vis-a Vis food security and high level of people being displaced. Several Internally displaced

persons (IDP) camps have been opened in the middle-belt, and south-south areas because of flooding.

Desertification: Desertification is increasingly rendering large swathes of fertile land into desert. A report published in the *Journal of Ecology and the Natural Environment* says that more than 60 percent of the Nigeria's land is affected. Desertification is heightened by the combination of extremely high deforestation rates, increased temperatures and decreasing rainfall across the no are all contributing to the desertification of the country. Desertification is the encroachment of the desert on land what was once fertile. A study conducted from 1901 to 2005 gathered that there was a temperature increase in Nigeria of 1.1 °C, while the global mean temperature increase was only 0.74 °C. The same study also found in the same period of time that the amount of rainfall in the country decreased by 81mm. It was noticed that both of these trends simultaneously had sharp changes in the 1970s. Desertification is an advanced stage of land degradation where soil has lost part of its capability to support human communities and ecosystem. Desertification is being fueled by poor land use, unsustainable grazing practices, deforestation, and the consumption pressures associated with a booming population. The Soil surface not protected by permanent vegetation becomes subject to: erosion by water and wind; crusting by raindrop splash and trampling by animals; salinisation by evaporation; and water logging in topographic depressions since water is no longer extracted by permanent vegetation.

Odugo (2010) has reported that there is severe threat of deserts encroachment in northern Nigeria with common features of sand dunes in the following states; Katsina, Sokoto, Borno, Yobe and Jigawa. This is as a result of reduces rainfall. Although, few Farmers in the north are taking steps to adapt to desertification and more frequent droughts – planting trees to provide shade and windbreaks, using diesel-powered pumps for irrigation, and sowing hardier crops such as beans – but such measures aren't nearly equivalent to the

enormous scale of the crisis. This is one of the negative effects of climate change.

Deforestation: Deforestation is a process where vegetation is cut down without any simultaneous replanting for economic or social reasons. Deforestation has negative implications on the environment in terms of soil erosion, loss of biodiversity ecosystems, loss of wildlife and increased desertification among many other reasons. A poor pro-climate culture is one of the major causes of deforestation. As of 2005, Nigeria has the highest rate of deforestation in the world according to the Food and Agriculture Organization of the United Nations (FAO). Nigeria has an annual deforestation rate of about 3.5 percent, meaning an average yearly loss of between 350,000 and 400,000 hectares of forest cover. Official figures say Africa's largest nation loses over 10.5 billion naira (\$34.3 million) every year to environmental challenges such as deforestation, drought, and desertification, but wider unofficial ones put the annual cost in the billions of dollars. Nigeria's wide biodiversity of various birds' species, mammals, reptiles, amphibians and higher plants will also be strongly affected by the negative impacts of deforestation.

Water Shortage: Presently lake-chad in the North eastern Nigeria which appears to be shrinking has been under pressure from herdsman trying to get drink for their cows as well as local farmers seeking for irrigation water and indigenous fisher men. The observable change in distribution of rainfall, drought as occasioned by global climatic changes has largely limited the amount of available resources from various water bodies. Approximately half of Nigeria's population now has no access to clean water (350africa.org). Generally, water scarcity has the tendency of increasing the transmission of water borne disease like typhoid fever, river-blindness and cholera.

Human Health: Some climate-sensitive diseases like severe heat stress due to increase in temperature, increase in malaria due to increase in rainfall, flooding as these water bodies serves as host to mosquitoes.

Reduction in air quality due to pollution could create respiratory issues, skin diseases, and exhaustion.

National Security: Climate change affects availability of natural resources like fertile/arable and usable water leading to regional migration, frequent herders-farmers clashes across the country.

These effects among others are as a result of Climate change fueled by an adverse natural change in the usual weather found in a place and uncontrolled anthropogenic activities. World Meteorological Organisation (WMO) 2019 reports that the world is now 10^oC warmer than it was before widespread industrialization; the global average temperature for the first 10 months of 2018 was 0.98^oC above the levels of 1850-1900. This is being seen as the major cause of climate change.

IPCC (2018) suggest that if countries fail to act, the world will face catastrophic change – sea levels will rise, ocean temperatures and acidity will increase and our ability to grow crops would be in danger.

The challenge now is, what is Nigeria strategic response to the raging and devastating effects of climate change? This paper aims to present a strategic approach of reaching out (with climate change awareness campaign with the aim of bringing about a change) to all our school age learners in the nation's primary and secondary schools, who will invariably become political leaders, technologist, teachers, parents of tomorrow that would take actions towards tackling climate change. Change in climate invariably translate to changes in our environment-this means that there are variations in weather and climatic factors like temperature, rainfall, wind, soil pH, soil structure, soil microorganism, pest, diseases, air content, pollution, rising sea levels.

A pictorial summary of the climate change cycle effect

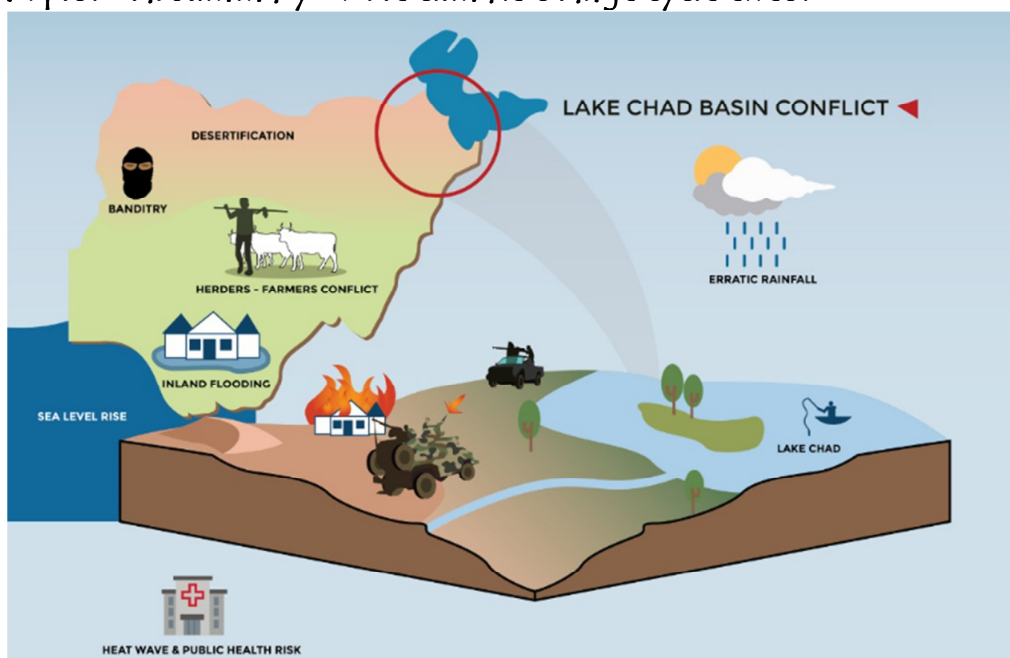


Figure 2: Pictorial summary of the climate change cycle effect.

Source: <https://goroinitiative.org>

The Primary and Secondary School Education- Mitigation Option

Developing country like Nigeria should use her lofty primary and secondary schools' educational policy to mitigate the rampaging effects of climate change, as it has the capacity of reaching over 20million young school learners within a 12-year period. Primary education is the aspect of the basic education offered to every child of school age, between the ages 4 to 11. It is the foundation of education, where children are prepared for post primary education and tertiary education. At this level of education pupils is taught the basic skills of learning, and it is at this level of education that pupils are expected to acquire the literacy that will prepare them for the next level of education. Nigeria with an estimated population of 182

million with more than half its people under 30 years of age, gives the nation a strong advantage in reaching out to these young ones with message of climate change. The national policy on education in Nigeria succinctly outlines the goals of Nigeria's primary and secondary school education to include:

The Federal Republic of Nigeria (2004), states that primary education refers to education given to children aged 6 to 11 plus in primary schools and that the primary level is the key to the success or failure of the whole system since the rest of the education system is built upon it. This statement confirms the fact that the primary level of education is most crucial to the success of other levels, hence the need for the stakeholders to do everything possible to lay a solid foundation for its sustainability. For primary education to be the bedrock of educational system, Umoh (2006), maintains that it must bring to the learners elementary and general knowledge of science, by teaching them to use and operate scientific objects and gadgets so that they may be conversant with such foundational knowledge as they advance to other levels. In other to give the primary school (education) the focus, FRN (2004) enumerated the goals of this level as to:

- a. Inculcate permanent literacy and numeracy, and ability of communicate effectively;
- b. Lay a sound basis for scientific and reflective thinking;
- c. Give citizenship education as a basis for effective participation in and contribution to the life of the society.
- d. Mould the character and develop sound attitude and morals in the child.
- e. Develop in the child ability to adapt to the child's changing environment.
- f. Give the child opportunities for developing manipulative skills that will enable the child to function effectively in the society within the limits of the child's capacity.
- g. Provide the child with basic tools for further educational advancement, including preparation for trades and craft of the locality.

These goals when holistically implemented will among others help to create massive awareness and discussions about the reality and effects and mitigations and subsequent adaptation to the global change in climate. The first step in solving any problem is to have adequate knowledge of the status of such problem before strategic solutions could evolve. Environmental, pro-environmental protection agencies/clubs could also be established at schools to help educate these teeming youths. Nigeria presently has about 23m learner's in primary schools and about 4million learners at the secondary school level (NBS, 2014)

Aims of Secondary Education in Nigeria

The Federal Government of Nigeria has clearly spelt the aims and objectives of secondary education in the country to include preparation for:

- (a) Useful living within the society; and
- (b) Higher education

In Specific Terms Secondary Education Shall

- (a) Provide all primary school leavers with the opportunity for education of a higher level, irrespective of sex, social status, religious or ethnic background.
- (b) Offer diversified curriculum to cater for the differences in talents, opportunities and future roles,
- (c) Provide trained manpower in applied science, technology and commerce at sub professional grades,
- (d) Develop and promote Nigerian languages, art and culture in the context of world's cultural heritage,
- (e) Inspire students with a desire for self-improvement and achievement of excellence,
- (f) Foster national unity with an emphasis on the common ties that unite us in our diversity,
- (g) Raise a generation of people who can think for themselves, respect the views and feeling of others, respect the dignity of labour,

appreciate those values specified under our broad national goals and live as good citizens;

(h) Provide technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development.

(i) Equip students to live effectively in our modern age of science and technology (FRN 2013).

From the objectives outlined, we can deduce that the secondary school education sector is consequently pivotal to the actualization of the current national and global policy objectives. Secondary education in Nigeria is one of the levels of education for the achievement of the philosophy and objectives of Nigerian Education as highlighted in the National Policy in Education (2004). Nigeria is considered highly vulnerable to climate change effects because she presently lacks the basic and required technological capacity, political, educational and financial commitment that is desired to fight and cushion the effects of climate change. But Nigeria has a strong base of youthful population who are either in or will pass through the primary or secondary school educational system that gives us the edge of exposing them to the issue of climate change. Once they are able to grasp the pro-environmental consciousness ideal then we are sure there will be better management of the environment. Efforts by these schools enlightenment and education will help mitigate the unimaginable consequences and adapt to and manage the unavoidable. These outlined objectives when implemented will help to impact strategic environmental education-teaching how our natural environment function and particularly how we can manage our present environment sustainably. These young Nigerian learners would be exposed to academic reasoning on the concept of climate change. This will spur them to take action to protect the environment. It will also help to prepare them to evolve suitable and sustainable eco-friendly solutions to climate change effects. The NPE also has provision for science, technology, Engineering and mathematics (STEM) which forms the bedrock for innovation of new technologies and execution of climate change mitigation strategies and ethical adaptation schemes.

Climate change education does not need a totally new curriculum or subjects, it should rather be taught across all subjects at the primary and secondary school level, and within the domain of the sciences, social sciences and humanities as it has both political, social aspect for example the issues of migration caused by natural disasters.

Primary and secondary school education in Nigeria makes hand-on learning exciting as they take students out on excursions to see climate change first hand. The dangers of single use plastics, need for re-using materials to curb wastes and create a clean environment should form the framework of subjects like civic education, agricultural sciences, integrated science, etc. More so, the present tree planting campaign at secondary school level will be one of the most efficient way of afforestation of those areas that are being threatened by desertification. Primary and secondary school education in Nigeria is important as part of the global response to climate change, it helps to improve and increase "climate literacy" among the school age pupils and students encouraging change in attitude, pro-climate enculturation, arming them with a lot of information that would help them play important role in increasing adaptation and mitigation capacities of impacted communities.

It is important to note here that the primary and secondary school education in Nigeria forms part of the UNESCO education for Sustainable development (ESD) programme (UNESCO, 2014).

Nigeria's primary and secondary school education as drawn from the NPE,2013 has the capacity to equip all learners with the knowledge and competencies required for developing a green environment, encouraging low carbon emission and building climate -resilient communities.

Primary and secondary school pro climate education in Nigeria will help in;

- Community sensitization and mobilization

- Promotion of conservative, and cleaner alternative sources of energy
- Promotion of alternative means of livelihood
- Promotion of dryland agricultural technology
- Promoting alternative water source for humans, plant and animals use through solar powered boreholes

Nwankwoala (2015) opined that such environmental education would focus on engaging with citizens of all demographic to:

- Think critically, ethically and creatively when evaluating environmental issues;
- Make informed judgements about environmental issues
- Enhance individual appreciation of environment resulting in positive environmental behavior

Under the basic sciences at the primary school level and the core sciences in the secondary school level emphasis on should consistently be laid on creating climate changes awareness, climate change effects, mitigation and adaptation.

Summarily, teaching climate change education across all subjects will help:

Increase Imagination and Enthusiasm

Climate change awareness and education is hands-on, this makes learning interactive and it stirs-up the imagination and unravels creativity. When climate change education at this stage is integrated into the curriculum, students are more keened and involved in learning, which raises student accomplishment in core academic areas.

Improve Community-Life and Take Responsible Eco-Friendly Actions

Through climate change education in primary and secondary schools, a sense of community life and students' connections to their host community is enhanced. Then they can take action to keep it clean- by not dropping waste on walkways, gutters, and drains, reduce

pollution, and get involved in its future development. This will help them contribute their quota towards finding solutions to present environmental issues around their immediate communities.

Students and Teachers are Empowered

Pro-climate change education at Nigeria's primary and secondary school levels will promote positive dynamic learning, citizenship, and self-leadership. It will also afford the teachers the opportunities of building their own environmental knowledge and teaching skills.

Critical and Creative Thinking Skills are Enhanced

Early climate change education across subject domains will encourage students to research, investigate how and why climate variability happens, and generate personal ideas about solving complex environmental concerns. By developing and enhancing critical and creative thinking skills, Climate change awareness helps nurture a new breed of informed consumers, workers, as well as policy or decision makers. It will also assist students in appreciating how their present decisions and actions affect the environment, builds knowledge and skills necessary to address complex environmental issues

Achieve the goals of the National Policy of Education

By integrating climate change education across all subject (science, math, English language, fine arts, history, civic education etc.) both at the primary and secondary school level, the outlined objectives of Nigeria's policy on education at both state of education can be achieved. That makes interdisciplinary learning possible with its attendant benefits.

Learning go-beyond the four Walls of the Classroom

Climate change education will both present opportunities for practical learning outside of the classroom, connect and relate their learning in the daily living within their communities. As much as helping students understand the interplay of cultural, social,

ecological, political and economic issues as it affects the climate and environment.

Tolerance and Understanding are Reinforced

With a robust climate change awareness/education pupils/student are encouraged to investigate varying sides of issues become more sensitive, have respect for the environment and to appreciate the big picture. It promotes broadmindedness of diverse opinions about climate variability with different cultures and climate.

The children are our future, the earlier we educate on climate issues the more secure will our future be.

RECOMMENDATION

From the foregoing, more concerted efforts would be required by school teachers to drive home the awareness message of climate change. This awareness message should be taught across all subjects, practical signs and symbols should be conspicuously displayed around the learning environment that will help convey the message, environmental/climate-based research institutions, local authorities on environmental issues and climatic changes should visit schools to share their reports and bring students/teachers on board for the same course, capacity building for primary and secondary school teachers and administrator on climate change. Government should not only enact but enforce laws to curb excessive emission of greenhouse gases and gas flaring in Nigeria. Pro-environmental students' clubs should be encouraged and supported in both primary and secondary schools across the country.

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