The Necessity of climate change and environmental education curriculum in Nigeria's Basic Educational System

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Abstract

The impact of past environmental crises has mostly been local or regional. However, the challenges of climate change are global in contrast. It is believed that one of the ways of preventing this global challenge is through education. As the world grapple with the challenges of global warming and climate change, attention is shifting to climate change education as a way of increasing awareness and behavioural change. This study examined the necessity of climate change and environmental education curriculum in Nigeria's Basic Educational System. This study used desk review of existing literature and online materials which were analyzed using content analysis method. The result of the findings reveal that Nigeria has a very large youthful population that are exposed to climate risk and hazard. Climate change portends a serious threat to poverty eradication and sustainable development in general, and the achievement of the Sustainable Development Goals (SDGs) in Nigeria. Nigeria can thus leverage on the size and youthfulness of its population to harness the entrepreneurship opportunities presented by climate change and global warming issues. The findings of the study reveals that the introduction of climate change and environmental education curriculum will help Nigeria strengthen its education system's resilience to climate change and empower its large population of children and youth to lead environmental action and drive national transformation for a more sustainable and life-sustaining future. Based on the findings, the study recommended the need to solicit the cooperation of the stakeholders and ensure that the curriculum is translated into Nigerian local languages.

Keywords: Basic education, climate change education, climate change curriculum, environmental education and entrepreneurship.

Introduction

Climate change is one of the most catastrophic occurrences that has caused more widespread worry to the global community in recent times. Because of climate change, it is not necessary to have the highest level of education to see that something is wrong in the world right now. According to Muhammad and Dada (2014) one does not need to be told that conditions are changing because of the occurrences all around us, such as the annual over flooding, rising desert encroachment, deforestation, erosions, dirty rivers, atmospheric pollution, and many other environmental problems. The 'how and why' of climate change and what has to be done, according to Dada and Muhammad (2014), are still areas that require clarification.

Nigeria has been categorized as having "extremely high risk" on UNICEF's global Children's Climate Risk Index. The social, economic, and environmental systems in Nigeria are affected cumulatively by heavy rainfall, floods, rapidly rising temperatures, expanding aridity and soil erosion, environmental degradation and biodiversity loss, and ecosystem destruction. The rights of children to survive, grow, flourish, and learn are directly threatened as a result of these conditions, which also hinder development and poor resource management.

Nigeria is the most populous country in 2022, with a population estimate of around 220 million. With 70% of the population under 30, 42% under 15, and a median age of 18.1 years, the nation boasts of the greatest population of youths in the entire world. Children make up more than 103 million of Nigeria's population (UNPD, 2019). Therefore, according to UNICEF's worldwide Children's Climate Risk Index (CCRI) (UNICEF, 2021) it accounts for roughly 4% of the world's child population and 10% of children living in countries with extremely high risk. By 2050, one in every thirteen births will occur in Nigeria, increasing the number of children at risk, tightening the competition for scarce resources, and straining social systems like health and education, which are already under a lot of stress from the effects of climate change (UNICEF, 2021). Due to this, Nigeria's educational system must be ready to reduce the effects of climate change on children's access to high-quality education through sector planning that is climate-resilient and disaster risk reduction. But this is not sufficient on its own. In order to empower Nigeria's children and youth to demand and lead environmental action as well as to drive national, regional, and global transformation for a sustainable future, education must be used as a fundamental catalyst.

Participants at an International Seminar on Climate Change Education (ISCCE) (UNESCO, 2009) have long argued that Nigeria needs a curriculum on climate change. The Nigerian Educational Research and Development Council (NERDC) then decided to include some parts of climate change teaching in some topics at the BE level in Nigeria in 2012 (Baba, Ibrahim, Sambo & Bayaro, 2013). The implementation of a climate change curriculum into Nigerian basic education has sadly not taken place after ten years of this initial endeavour.

Recently, a short-term consultant service to create a climate change curriculum for Nigerian basic education has been advertised by the United Nations International Children's Education Fund (UNICEF) Nigeria Country Office (NCO). This report reiterates the need for climate change curriculum in the country and the need for all hands on to be on deck to ensure the realization of this effort while the nation waits for the achievement of this ambitious aim.

Methodology

This study is based on desk review of existing literature. Thus, this document was prepared from information provided by Ministries, Departments and Agencies (MDAs) and other stakeholders, and from available information in the literature online. Data was analyzed using content analysis method.

The Nigerian Socioeconomic Scenario

Nigeria is the most populous country in Africa. It features a multi-ethnic and culturally diverse civilization with more than 250 ethnic groups and is made up of 36 independent states. In Nigeria, there are 198 million inhabitants, more than half of whom are under 18 (NBS, 2017). The population is expected to double by 2050 at a rate of 2.6 percent annually. According to World Bank estimates, Nigeria will have more than 400 million citizens by 2050, making it the third most populated nation on earth.

Nigeria is regarded as having the largest economy in Africa and became a lower-middle-income country in 2014 (IMF, 2017). According to World Bank (2015) estimates, the nation's gross domestic product (GDP) is $481 billion and its gross national income (GNI) per person is $2,820. Despite this, Nigeria placed 157th out of 188 nations in the data update of the 2018 Human Development Index (UNDP, 2018). In the northeast, the number is 77%, compared to 46%

nationally who live below the poverty line (UNOCHA, 2017). Both men and women experience high rates of unemployment (NBS, 2017). It is estimated that 17.6 million young Nigerians are unemployed, a staggering number that is expected to climb over the next five years (Economic Recovery and Growth Plan, 2017). Urban areas in Nigeria are expanding at a rate of 4.3 percent each year, compared to 1.14 percent for rural areas, which is over four times as fast (https://esa.un.org/unpd/wup/CD-ROM/).

The eradication of poverty, sustainable development in general, and the accomplishment of the Sustainable Development Goals (SDGs) in Nigeria are all gravely threatened by climate change. This is due to the nation's sizable rural population, which depends on natural resources (such as water, biodiversity, and grassland) and economic and development sectors (like agriculture and fisheries) that are susceptible to climate change. With the limited resources at hand, many rural populations are adapting to climate concerns in unique ways. Unfortunately, these rural majority populations have very little ability to adjust to the effects of climate change. Although the costs of ignoring climate change or failing to adapt to it are relatively unclear, it is anticipated that these actions will have significant negative welfare effects. Nigeria has a crucial leadership role to play as a nation that is both one of the biggest GHG producers in Africa and one that is very vulnerable to the effects of climate change.

Climate Change in Nigeria

According to several studies (Elisha et al., 2017; Ebele and Emodi, 2016; Olaniyi et al., 2013), Nigeria's climate has been changing, as evidenced by temperature increases, variable rainfall, sea level rise and flooding, drought and desertification, land degradation, more frequent extreme weather events, affected fresh water resources, and a decline in biodiversity. Rainfall has become more frequent and intense, resulting in significant runoffs and flooding in several areas of Nigeria (Enete, 2014).

According to a recent analysis of the nation's anticipated future climatic trends, which was included in the Third National Communication, the minimum temperature increase between 2050 and 2070 could range from 1.48°C to 1.78°C and the maximum temperature increase between +3.08°C and +3.48°C relative to the baseline of 1990. With the exception of the northeast Sahel zone, where the scenario analysis shows less extreme events linked to rainfall and flooding, the majority of the country's ecological zones are anticipated to experience an increase in the number of days with rain and days with extreme rainfall events that may cause floods.

Variation in rainfall is expected to keep rising. According to Akande et al. (2017) and Ebele and Emodi (2016), increased precipitation and rising sea levels are predicted to intensify coastal land flooding and submersion. Due to a decrease in precipitation and an increase in temperature, droughts have also become a regular occurrence in Nigeria and are predicted to do so in Northern Nigeria (Amanchukwu et al., 2015; Olapido, 2010). Lake Chad and other lakes in the nation are in danger of drying up and disappearing (Elisha et al., 2017; Dioha & Emodi, 2018). Since the 1980s, temperatures have increased dramatically (Enete, 2014; Federal Ministry of Environment, 2014). According to climate estimates for the foreseeable future, temperatures will rise significantly throughout all ecological zones (Akande et al., 2017).

Nigeria is listed as one of the ten most susceptible nations in the world in the 2014 World Climate Change Vulnerability Index, which was issued by the international risk analytics firm Verisk Maplecroft. The country is impacted by extreme occurrences and meteorological variability, including erosion, sea level rise, floods, and droughts (FMEnv, 2021). Additionally, Nigeria is

classified as having extreme risk in the north and high risk in the south by the UK-based risk business Maplecroft's 2016 Climate Change Vulnerability Index (CCVI). According to the Germanwatch Organization's 2019 Climate Risk Index, Nigeria is one of the world's most susceptible nations and is classified as a high-risk area (NCCP, 2021).

Impact of Climate change in Nigeria

The effects of a changing climate in Nigeria include loss of life and property, harm to socioeconomic infrastructures and ecological systems, escalation of intercommunal conflicts due to the scarcity of freshwater resources and other biodiversity resources (especially in remote areas of the nation), and serious threats to the nation's food security (FMEnv, 2021).

The 2012 floods, which affected 7 million people in 30 of the 36 states, caused 2.3 million people to be relocated, and resulted in 363 fatalities, were one notable incident (Amangabara & Obenade, 2015). At the time, it was believed to have cost the economy NGN 2.6 trillion (USD 17.3 billion) or 1.4% of GDP. The nation was once more hit in 2018, when floods hit 12 states. It was estimated that 199 individuals died and almost 4,000 were injured, affecting over 2 million people. There were more than 600,000 domestic migrants. Property and agricultural land suffered significant losses (FMEnv, 2021).

The 2022 floods in various parts of Nigeria led to an estimated economic loss of $9.12bn (N4.2tn at official exchange rate of N460.78/$), according to the Federal Government (Nnodim, 2022). The 2022 flooding affected all the 36 states and the Federal Capital Territory in Nigeria with varying degrees of damages and people affected. The National Emergency Management Agency, (NEMA) reported that 662 persons lost their lives, 3,174 suffered injuries and 2,430,445 individuals were displaced by the 2022 flood disaster in Nigeria (Ogune, 2023). On the other hand, the National Agricultural Extension Research Liaison Services (NAESRLS), reported that investment worth about N700 billion in Nigeria's agricultural sector was destroyed by the 2022 floods (Omanga, 2023).

It is feared that by 2050, climate change might cause a 6%–30% GDP decline, costing anywhere from US$100–460 billion (DFID, 2009). If no adaptation is made, between 2 and 11% of Nigeria's GDP may be lost by 2020, which would hinder the country's development aim of ranking among the top 20 economies in the world (FME, 2016). While the conversion of forest for agriculture, urbanization, and other land-use changes contribute to biodiversity loss and water contamination, further weakening the resilience of Nigeria's ecological zones, accelerated climate change is also expected to contribute to more frequent floods, droughts, and heatwaves (Agboola, 2021).

According to the International Food Policy Research Institute (IFPRI), by 2050, the combined effects of rising temperatures, falling precipitation, floods, and droughts could cause an average decline in rice, wheat, and maize yields of up to 14%, 22%, and 5%, respectively, and an average reduction in food availability in Sub-Saharan Africa of 500 calories per person, or a 21% decrease (IFPRI, 2009).

According to studies, the level of susceptibility varies from one part of the country to another. They went on to explain that Nigeria is particularly vulnerable to climate change in its northeast and northwest geopolitical zones, which make up the dry and semi-arid regions of northern Nigeria and are home to the majority of the nation's cattle. The averagely low adaptive capacity, low

sensitivity, high relative exposure, and high relative vulnerability of the regions are to blame for this.

Adamawa, Bauchi, Borno, Jigawa, Kano, and Yobe States have high susceptibility to climate change, while other States including Kebbi, Katsina, Sokoto, and Zamfara States have medium vulnerability, according to recent extensive climate vulnerability mapping of the dry and semi-arid northern Nigeria. Compared to other areas of northern Nigeria's arid and semi-arid regions, Kaduna and Taraba States are less vulnerable to climate change (NCCP, 2021).

The country's security situation is reportedly deteriorating in some areas as a result of climate change. The risks of Nigeria's fragility are being exacerbated by the problems that climate change poses to the nation's socioeconomic systems and environment (Nwankpa, 2022). Experts predict that the cost of climate change to Nigeria will increase from the present $100 billion yearly cost to $460 billion in 2050 (Ekeruche, 2022). At the most recent ninth international Lagos Climate Change Summit, Prof. Chuwumerije Okereke, Director of the Center for Climate Change and Development at the Alex Ekwueme Federal University in Ebonyi State - insisted that from 2020 to the present, climate change has already cost Nigeria N15 trillion, or 2 to 11% of the country's GDP, and that by 2050, it will cost the nation N69 trillion, or 6 to 30% of the GDP.

Nigeria's Response to the Challenges of Climate Change

Nigeria has given the issues posed by climate change substantial consideration. Nigeria has joined numerous international conventions and protocols aimed at mitigating climate change and reducing greenhouse gas (GHG) emissions. Nigeria has collaborated with a great number of international donor organizations to create a variety of intriguing national climate change mitigation policy documents and action plans. In November 2003, The First National Communication was created. The second National Communication (SNC) was produced in December 2006.

A Department of Climate Change Unit (DCC) has been established in Nigeria's Federal Ministry of Environment in Abuja. To carry out the Convention's and its protocol's activities, DCC was established. It also manages the activities of the Inter-ministerial Committee on Climate Change, whose members are the Ministries of Finance, Agriculture, and Water Resources; the Energy Commission; the Nigerian National Petroleum Corporation (NNPC); the Foreign Affairs; the Nigerian Meteorological Agency (NIMET); business; nongovernmental organizations (NGOs; Nigerian Environmental Study/Action Team); and academia.

The National Climate Change Policy for Nigeria (2021-2030) was created in 2019 by the Department of Climate Change within the Federal Ministry of Environment in Nigeria. The goal of the policy is to ensure sustainable development and a climate-proofed economy through multi-stakeholder involvement in a low-carbon, climate-resilient Nigeria. Nigeria published the 2021 Climate Change Act in 2021, which offers a framework for national-level climate action. According to the act, the Secretariat advises the Ministries, Departments and Agencies (MDAs) in charge of regulating the Nigerian educational curriculum on how to incorporate climate change into various disciplines and courses across all educational levels. The recently UNICEF is mobilizing government partners and a network of key stakeholders in developing a climate change and environmental education curriculum for Nigeria.

The Necessity climate change and environmental education curriculum in Nigeria's Basic Educational System

Climate change is naturally a complex phenomenon in which conveying the meaning, causes, and effects of climate change in a straightforward manner presents several difficulties. Due to a lack of understanding of what climate change actually implies, the most important aspects of climate change issues, theories, and legislative recommendations get lost in the complexity. The basic principles of climate change, such as the fact that the globe is warming because humans are producing more greenhouse gases, are well established; nonetheless, the actual phenomenon is commonly reduced to an unproven hypothesis (Sanchez, 2016). Susan (2002) asserts that because climate change incorporates so many academic disciplines - including energy, environment, geography, politics, chemistry, biology, and economics it is a fantastic subject for students to learn about. Students must utilize their analytical and quantitative skills as well as their capacity to learn about, reason about, and comprehend complicated subjects. Unfortunately, some of the instructional resources available reflect a number of widely held myths regarding climate change.

According to Baba, Ibrahim, Sambo, and Bayaro (2013), basic education (BE) is essential for shaping young people's perspectives and instilling behavioural patterns that may have a positive impact on the environment. The first is that among all educational levels in the nation, BE has the highest concentration of students. By shaping the younger population's behaviour for a change in our behaviour that will help to ameliorate the challenges of climate change, the introduction of a climate change curriculum at this basic education level will aid in the beginning of the process of social engineering. This position was further supported by Nepra, Strejková, and Kroufek's (2022) argument that climate change and environment education curriculum is necessary due to students' limited knowledge of climate change, error-filled understanding of it, heavy media influence, and lack of appropriate didactic approaches to effectively change students' attitudes and behaviours.

According to Kolenaty, Kroufek, and Cincera (2022), having enough information affects climate change worries, which in turn affects kids' willingness to take action to protect the environment and the climate. Children's engagement and eventual action are also influenced by their perceptions of their capacity to effect change at the individual, municipal, and governmental levels, according to Ross, Rudd, Skains, and Horry (2021).

According to Karsgaard and Davidson (2021) and Rousell et al. (2021), students themselves should be considered as having a stake in the societal issue of climate change as it pertains to education. In order to engage children's political agency in classrooms, universities, and the general public, it is important to educate them about climate change (Cutter-Mackenzie & Rousell, 2018). This makes it imperative that the steps Nigeria takes today will not only strengthen the education system's resilience to climate change but will also empower the country's large population of children and youth to call for and lead environmental action, including through education have immense potential to drive national, regional and global transformation for a more sustainable and life-sustaining future.

Leveraging Nigeria's Youthful Population for Climate Actions

Nigerians must be aware of what climate change is, how it is affecting them, and how they can adapt if they are to be fully incorporate adaptation to it in all facets of national life (BNRCC, 2011). In order to confront the dangers of climate change and execute adaptation, people, communities, and the nation as a whole need to be equipped with specialized skills. A wide spectrum of people,

especially the most vulnerable, must have access to information and knowledge sharing (Anabaraonye et al., 2019; BNRCC, 2011).

The problems of climate change and global warming offer many opportunities for young people to start their own businesses. Nigeria has a lot of potentials to benefit from climate action if its size and youth are effectively utilized. Important points of entry for this could be through:

i. The Bank of Industry, Nigeria's Youth Entrepreneurship Support (YES) Program, which aims to combat Nigeria's alarming youth unemployment problem by enhancing young people's abilities and supporting their entrepreneurial endeavors. The YES program aims to provide young people with the necessary knowledge and skills to become self-employed by launching and running their own enterprises; and.
ii. The African Development Bank's Youth Entrepreneurship and Innovation Multi-Donor Trust Fund, which supports Africa's entrepreneurship ecosystems by providing youth- and women-led startups, as well as micro, small, and medium-sized businesses, with the knowledge, resources, and supportive environments needed to operate bankable, environmentally friendly businesses.
iii. African Youth Initiative on Climate Change (AYICC). AYICC is an umbrella initiative of all youth organizations working to combat climate change in Africa. In order to achieve its goal of "An African continent with an empowered and united youth movement, actively participating in decision-making and the adoption of sustainable options towards a better climate and social equity," it mobilizes all youth organizations that share this vision.
iv. Various Youth Association could also be identified and engaged while implementing Nigeria’s communication strategy.

Conclusion

This study has examined the necessity of climate change and environmental education curriculum in Nigeria’s Basic Educational System. The findings of the study have shown that climate change and environmental education curriculum are a very important means of mitigating the impacts of climate change by moulding the consciousness of the younger population to make them more environment-friendly.

Recommendations

Based on the findings, the following recommendations are made;

i. It is important that whatever curriculum is developed should be translated into local languages in Nigeria. This will make the purpose of developing such curriculum effective in bringing about the desired behavioural change.

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