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**Usang N Onnoghen**

Department of Environmental  
Education, University of  
Calabar, Nigeria

**Ijeoma E Orji**

Institute of Education,  
University of Calabar, Calabar,  
Nigeria

**Nzemeka C Olisah**

Department of Physics and  
Industrial Physics, Nnamdi  
Azikiwe University, Awka,  
Nigeria

**Benjamin Anabaraonye**

Institute of Climate Change  
Studies, Energy and  
Environment, University of  
Nigeria, Nsukka, Nigeria

**Corresponding Author:**

**Benjamin Anabaraonye**

Institute of Climate Change  
Studies, Energy and  
Environment, University of  
Nigeria, Nsukka, Nigeria

## The impacts of climate change on sustainable economic growth in Nigeria

**Usang N Onnoghen, Ijeoma E Orji, Nzemeka C Olisah and Benjamin Anabaraonye**

### Abstract

The impacts of climate change which include flooding, erosion, drought, etc. are felt in a profound way in the socio-economic sectors of Nigeria. This study is a literature review work and has identified climate change education as very vital for preparing individuals, communities and institutions for climate change impacts and to learn the adaptation and mitigation strategies needed to address poverty and ensure sustainable livelihoods and economic growth in Nigeria. It also highlights the green entrepreneurial opportunities in climate change adaptation and mitigation which have the capacity to provide employment for many youths in Nigeria thereby addressing poverty and helping to achieve the United Nations Sustainable Development Goals. The study recommends that communities and institutions with the aid of policy makers in government, private sectors, non-governmental organizations and educational institutions should be educated as a matter of urgency about climate change adaptation and mitigation strategies for sustainable economic growth in Nigeria.

**Keywords:** Adaptation, climate change, education, mitigation, sustainable economic growth

### Introduction

Climate change has been described as a statistical variation that persists for an extended period, typically for a decade or longer. It includes shift in the frequency and magnitude of sporadic weather events as well as the slow but continuous rise in global average surface temperature (Intergovernmental Panel on Climate Change [IPCC, 2007] [15-16]). The German advisory council on climate change noted that climate change is a threat already having substantial impact on human beings and the natural ecosystem both in developed and developing countries but at varying degrees (German Advisory Council on Global Change [WBGU, 2011]). The Intergovernmental Panel on Climate Change (IPCC) defines climate change as statistical variations that persist for an extended period typically decades or longer. The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as the “adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual stimuli or their effects which moderates harm or exploits beneficial opportunities. Various types of adaptation can be distinguished including anticipatory and reactive adaptation, private and public adaptation, and autonomous and planned adaptation (IPCC, 2001) [14]. Climate mitigation is any action taken to eliminate or reduce the long-term risk and hazards of climate change to human life, property and the society. The Intergovernmental Panel on Climate Change defines mitigation as: “An anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases “(IPCC 2001; GGW, 2018) [14, 13]. Climate resilience is the capacity for a socio-ecological system to absorb pressures and maintain function in the face of external stresses imposed upon it by climate change (Folke *et al.*, 2010; Moench, 2014) [12, 22]. It also includes the ability and capacity of an ecosystem to adapt, reorganize, and evolve into more desirable configurations that improve the sustainability of the system, leaving it better prepared for future climate impacts (Carpenter *et al.*, 2001; Folke, 2006) [8, 11]. Climate change is a rising global concern; it refers to changes in atmospheric gaseous composition by anthropogenic activities, in addition to natural climate variability (Moser and Dilling 2004; Lorenzoni *et al* 2007; UNFCC 1994) [23, 20]. “Climate change is one of the greatest challenges of our time. Climate change will affect, in profoundly adverse ways, some of the most fundamental determinants of health: food, air, water.

In the face of this challenge, we need champions throughout the world who will work to put protecting human health at the center of the climate change agenda” (Chan, 2008) <sup>[9]</sup>. In Nigeria, as in most of Sub-Saharan African countries, climate change is affecting the food production which also affects sustainable economic growth. This is redefining processes, consumption patterns and level of food availability in households, communities, nations, regions and continents. Cases of flood, drought, desertification and erosion are all changing the food dynamics by disrupting the livelihood assets of the poor and needy in the country. This is leading to increasing cases of hunger and starvation and is also exacerbating resource conflicts and subsequent migration (Anabaraonye, Amaechi, Okolo, Adeniyi & Nwobu, 2022) <sup>[5]</sup>. Cognizant of the changing global temperature and the threats to man’s planetary existence, different communities and nations have been coping with climate change but with limited success. The need for mainstreaming adaptation and mitigation strategies is urgent as environmental maladies threaten to overwhelm man’s adaptive capacity and this is growing in propensity daily taking newer life threatening forms as men pollute the biosphere. There is, therefore, the great need to explore climate change adaptation and mitigation strategies to address poverty and ensure sustainable economic growth in Nigeria.

### Methodology

Data used for this study is derived from literature review of published works including academic articles, journals, conference papers, textbooks and internet materials. The researchers gathered much materials for the research but summarized the characteristics that centered more on “the impacts of climate change on sustainable economic growth in Nigeria”. This enabled the researchers to generate the synthesis of various researchers’ views on the subject matter and further recommend strategies for adapting and mitigating climate change to address poverty and enhance sustainable economic growth in Nigeria.

### Results and Discussion

The issue of climate change has increased the severity and rate of occurrence of the flood disaster, with its negative impact on food production, food distribution, food utilization, and food security (IPCC, 2007) <sup>[15-16]</sup>. Climate change and increasing human influence in the natural ecosystems of rivers pose a greater risk to flooding in areas near the riverbeds (Klaudia, Marzena, and Aleksandra, 2018) <sup>[18]</sup>. Nwaobiala and Nwosu (2014) <sup>[24]</sup> maintained that agriculture is one of the most weather-dependent human ventures in Nigeria. Agriculture suffers due to its vulnerability to climate change and African countries are particularly vulnerable to the incidences of climate given their dependence on rain-fed agriculture. Despite this fact, agriculture has remained an important source of livelihoods on the continent. Studies have shown that an average of 70% of the population in Africa, lives by farming; 40% of all export earnings come from agriculture and about one-third of the national income in Africa is generated by the agricultural sector (McCuster & Carr, 2006) <sup>[21]</sup>. In Nigeria today, the visible climate change impacts and global warming on fertility of soil and prospects for agricultural productivity occasioned particularly, by the prevailing challenges of flooding, erosion and excessive rainfalls,

remains an increasing challenge not just only to governments (state actors) with their various multi-lateral organizations but to numerous non-governmental organizations (NGOs) around the world (Anabaraonye, Okafor; & Eriobu, 2019; Anabaraonye, Okafor, & Hope, 2018) <sup>[4, 3]</sup>. These environmental threats that include erosion, flooding, drought, and desertification have continued to expose human beings to varieties of humanitarian concerns such as hunger and starvation, unemployment, poverty and disease (Birsal, 2019) <sup>[7]</sup>.

### The impacts of climate change on sustainable economic growth in Nigeria

Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Conference on Environment and Development (WCED), 1987). Sustainable economic growth can be defined as a rate of growth which can be maintained without creating other significant economic problems, especially for future generations (Economics Online, 2022) <sup>[10]</sup>. Environmental education has been identified by scholars as a potent tool for attaining the United Nations Sustainable Development goals in Nigeria (Onnoghen, Ojong, Omang, Obibessong & Asor, 2020) <sup>[25]</sup>. The following are the various impacts of climate change which can negatively affect sustainable economic growth and lead to poverty in Nigeria:

- **Drought:** Historically, a natural drought lasts about a decade. Due to climate change, there could be droughts in some regions lasting around three decades, also known as “mega droughts”. From a current historical frequency of 12%, these events may increase up to 60% due to possible changes in future anthropogenic greenhouse gas emissions and atmospheric concentrations measured in CO<sub>2</sub>-equivalents (Anabaraonye, Ewa & Wala, 2020) <sup>[6]</sup>. The cases of drought are much felt in the Northern States of Nigeria such as Borno, Zamfara, Kebbi, etc.
- **Floods:** Flooding is a general condition of partial or complete inundation of normally dry areas from overflow of inland or tidal waters or from unusual and rapid accumulation of runoff (Jeb and Aggarwal, 2008) <sup>[17]</sup>. Floods are an overflow of water usually from the ocean, submerging land areas. Climate Change-Related Water Disasters (CCRWDs) generate flooding in urban areas on the coasts, like those in Asian deltas rivers. These events could potentially have a negative effect on the health and economy of vulnerable populations in Nigeria (Anabaraonye, Ewa & Wala, 2020; Ajator, Anabaraonye *et al*, 2021) <sup>[6, 2]</sup>. Floods have led many schools to be closed, students drop out, properties destroyed, infrastructure damaged and formal learning temporarily stops (Achoka and Maiyo, 2008) <sup>[1]</sup>. When floods occur, schools are either closed or partially submerged in flood waters and this makes the roads bridges and foot paths impassable for students and teachers. Schools may be abandoned for some time as learners and teachers are forced to transfer for safety to other schools or drop out completely due to inaccessibility to schools (Lay *et al*, 2008) <sup>[19]</sup>. Floods can also disrupt farmers’ activities, and even destroy barns and farmlands thereby bringing poverty and untold hardship to the affected ones.

### A study on farmers' climate mitigation strategies in Ikom

The study of Onnoghen, Unimtiang and Ogbaji (2023) [26] examined social awareness strategies as a panacea for farmers' climate change mitigation measures in Ikom Education Zone, Cross River State, Nigeria. To achieve the purpose of this study, a null hypothesis was formulated to guide the study. A review of related literature was carried out based on the variable of this study. The survey research design was considered useful for the study. A multistage sampling was adopted in selecting the wards and six hundred and fifty-two (652) respondents used for the study. A thirty-item four-point scale questionnaire titled Social Awareness Strategies Farmers' Climate Change Mitigation Measures (SASFCCMM) was the instrument used for gathering data for the study. To test the hypothesis formulated for the study, multiple regression statistical tools was used for data analysis. The hypothesis formulated was tested at 0.05 level of significance. The results from data analysis and hypothesis testing indicated that there was a joint significant positive influence of seminar, agricultural extension services, mass media awareness and community-based/non-governmental organizations' activities on farmers' climate change mitigation measures. Based on these findings it was recommended among others that the use of mass media awareness in disseminating climate change information should be widely encouraged and utilized in helping farmers to continue to adopt sustainable climate change mitigation measures. Community-based organizations as well as non-governmental organization should be used more effectively in sensitizing and building the capacity of farmers to be able to cope with and adopt positive and climate change mitigation measures.

### Recommendations

1. Nigeria as a country should accelerate plans to eradicate extreme poverty as part of its commitment to the Sustainable Development Goals (SDGs). By so doing, accelerate the pace of economic growth thereby placing the country on the path of macro-economic transformation.
2. Most of the organs of government in Nigeria for addressing climate adaptation and mitigation strategies need more legal authority, staffing, and political support with adequate budgets to address national imbalance and inequalities especially as it relates to climate change and sustainable economic growth issues.
3. Nigeria should invest more in green entrepreneurship including agriculture and the renewable energy industry which are eco-friendly and will boost economic growth in the country.
4. There is need to develop a well-structured framework to strengthen the resilience of rural people in order to help them cope with short term and long term impacts of floods which is as a result of climate change thereby helping to address poverty.
5. New dams should be constructed as buffers and containers in the flood plains where irrigation farming shall be introduced to store up the food reserve or the height of old dams increased act as reservoir to accommodate more water intakes during floods. New farm practices like improved crops with changed planting season, drinking water or sanitation projects

should be introduced. Through dialogue at the local level, stakeholders can be involved in the context of climate change, the choice of strategies and policies will reflect the concerns of the citizens, and the latter will be empowered and become more involved in their community for its overall well-being.

6. Community leaders, civil society organizations, interest groups, decision makers and researchers should be integrated into adaptation and mitigation initiatives. They should share information on the latest developments to be communicated to the people. This will ensure local partnership and ownership of policy ensuring sustainability of policy where all stakeholders' interests are incorporated to local adaptation plan of action to bring about inclusive social mobilization of the people towards the common goal of sustainable economic growth in Nigeria.
7. Unemployed youths in Nigeria should be adequately educated on the green entrepreneurial opportunities in climate change adaptation and mitigation strategies like recycling, renewable energy, tree planting activities, etc, which can provide employment, good source of income, restore their dignity and prestige and eradicate poverty from their lives. This will in turn help to achieve sustainable economic growth and development in the nation (Anabaraonye, Okafor & Eriobu, 2019) [4].

### Conclusion

Waste recycling, tree planting activities and the use of renewable energy would be a promising solution for promoting sustainable development, as well as for addressing climate change, by reducing environmental impacts, enhancing energy security, and providing various developmental co-benefits, such as job creation and capital investment in green industry (Anabaraonye, Amaechi, Okolo, Adeniyi & Nwobu, 2022) [5]. The Global Environment Facility, The United Nations Institute For training and Research (UNITAR) and other Institutional Environmental Governance offer opportunities for the country to provide the people with their basic climate change educational needs thereby helping to achieve the sustainable development goals. However, International commitments must match the willingness of the government at all levels to address local climate change challenges leading to poverty in Nigeria. In conclusion, if the recommended strategies on climate change adaptation and mitigation strategies listed above are fully implemented, the quest and zest for poverty eradication and sustainable economic growth in Nigeria is attainable.

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