

## Mitigating The Negative Effects of Flooding on Sustainable Economic Growth in Nigeria

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### Abstract:

Flooding which is one of the impacts of climate change is being felt in a profound way on Nigeria's economic sector. Through literature review and participant observation, this study identifies that floodwaters pose immediate dangers to human health, but also long-term effects resulting from displacement and worsened living conditions which adversely affects the economy of the nation. This study further highlights poverty as one of the negative effects of flooding in Nigeria. It further identifies green entrepreneurship and climate change education as tools which can be used to mitigate the negative effects of flooding in Nigeria. It concludes with a clarion call for deeper research on the innovative strategies for mitigating the negative effects of flooding thereby enhancing sustainable economic growth in Nigeria.

**Keywords:** Climate Change, Education, Flooding, Poverty, Sustainable Economic Growth

### Introduction:

Flooding which is one of the impacts of climate change affects the sustainable economic growth of the nation in a profound way. It has led to the spread of water-borne diseases amongst farmers in rural areas in Nigeria. Flooding is caused by quick rise in water level which makes the water bodies to overflow its banks. Flooding is devastating in many ramifications, and is associated with some health risks which directly or indirectly also affects the socio-economic growth and development of the nation (Anabaraonye, Otti, Anukwonke, Ewa & Eslamian, 2022). Floods as noted by Odufuwa et al(2012) are the most frequent disaster and widespread natural hazards of the world. It is also noted that floods have caused 84% disaster deaths in the world with an average of 20,000 deaths per year, which makes only a few countries immune to floods (Odufuwa et al, 2012) Floods can be very dangerous depending on the nature and level of water volume involved. According to Ikani (2016), Flooding is the overflowing of water either as a result of torrential rainfall, a broken dam, a high rise in the volume of water in rivers, oceans or seas as a result of melting ice caps or prolong rainfall. Flooding was found to have influenced food insecurity (Akukwe and Ogbodo, 2015) as majority (99.3%) of the respondents adduced in a data generated from sampled households. This implies that virtually all the households had experienced one or more negative effects of flooding on food insecurity leading to poverty and since the sampled households were agrarian, the effects were devastating (Akukwe and Ogbodo, 2015). The occurrence of floods in Nigeria is not a recent phenomenon. Incidences of

destructive floods have been recorded at different parts of Nigeria. For instance, the floods that occurred in Ibadan (1985, 1987, 1990, 2011), Osogbo (1992, 1996, 2002), Yobe (2000), Akure (1996, 2000, 2002, 2004 and 2006), Makurdi in 2008, Sokoto in 2010, Ogburu and Oguta in 2012. In addition, the coastal cities of Lagos, Yenegoa, Calabar, Uyo, Port Harcourt and Warri frequently experienced floods (Akukwe and Ogbodo, 2015; Olajuyigbe, Rotowa & Durojaye, 2012). Of all these floods, the most devastating had been noted to be the August-October 2012 in Nigeria which pushed rivers over their banks and submerged hundreds of kilometres of urban and rural lands (Ojigi, Abdulkadir, Aderoju, 2012), with an estimate of over 7,705,378 Nigerians affected by the floods leaving 2,157,419 persons internally displaced (IDPs). Moreover, over 90% of the 36 States of the country were affected between July and October, 2012 with 363 deaths and more than 618,000 damaged houses (OCHA, 2012). It was also noted to have caused massive destruction of farmlands which resulted to food insecurity in parts of the country as significant proportion of areas (including the south eastern region) that produce the three main tuber food crops in Nigeria (namely yam, cassava and sweet potato), were affected by the floods. Many farmers lost their sources of livelihood as a result of the flood and were pushed into extreme poverty thereby negatively affecting sustainable economic growth in Nigeria. Flooding which is one of the impacts of climate change has been discovered as playing a great part in destroying people's sources of livelihood, wreaking properties and valuable belongings, inflicting water-borne sicknesses and diseases thereby leading to poverty in Nigeria (Anabaraonye, Ewa & Wala, 2020). Floods threaten food production, food prices as well as both nutritive and microbial quality of harvested food materials, and drives food insecurity and malnutrition (Anabaraonye, Ewa & Wala, 2020). Hence, flood can have negative effects on human security - food security, economic security, health security, environmental security, personal security, community security and political security. In 2007, flood caused a total of £3 billion damages in England and Wales (World Bank, 2012). Pakistan rain-induced flood of 2010 recorded \$10 billion in damages and affected 20 million people, among whom 3,000 deaths were recorded (World Bank, 2012). Flood does not only damage properties and endanger lives of people and animals; it equally leads to environmental degradation in the form of soil erosion, landslides, sediment deposition and the destruction of fish spawning substrates. Different incidence of flood is recorded in the country's geological history. Devastating floods have hit different cities and regions which have been recorded in previous studies (Durotoy, 1999; Folurunsho, 2001; Etuonovbe, 2011). These floods have paralyzed economic activities in many parts of the country rendering many people homeless, destroying roads and bridges thereby negatively affecting sustainable economic growth. Climate change adaptation and mitigation strategies will therefore help to tackle the challenge of flooding, eradicate 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 materials for the research but summarized the characteristics that

centered more on "mitigating the negative effects of flooding 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 mitigating flooding to address poverty and enhance sustainable economic growth in Nigeria.

### Understanding Poverty:

Poverty is one of the greatest problems facing developing countries in Africa including Nigeria in the 21<sup>st</sup> century. Poverty has always been the enemy of progress in any community or country and the fight against poverty is the No. 1 of the United Nations Sustainable Development Goals. This simply implies that everyone has a part to play in ensuring that the goal of zero poverty is achieved by 2030 as enshrined in the United Nations Sustainable Development Goals (SDGs). Flooding which is one of the impacts of climate change has been discovered as one of the leading causes of poverty which negatively affects sustainable economic growth in Nigeria (Anabaraonye, Oti, Anukwonke, Ewa & Eslamian, 2022). A holistic approach must be adopted through adaptation and mitigation strategies to address poverty and ensure sustainable economic growth in Nigeria. Poverty can be defined as the scarcity or the lack of a certain (variant) amount of material possessions or money. Poverty is a multifaceted concept, which may include [social](#), [economic](#), and [political](#) elements. [Absolute poverty](#), extreme poverty, or destitution refers to the complete lack of the means necessary to meet basic personal needs such as [food](#), [clothing](#) and [shelter](#) (UNESCO, 2015). According to the United Nations (1998), "Fundamentally, poverty is the inability of having choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to, not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living in marginal or fragile environments, without access to clean water or sanitation" (UN Statement, June 1998 –signed by the heads of all UN agencies). According to the World Bank, "Poverty is pronounced deprivation in well-being, and comprises many [dimensions](#). It includes low incomes and the inability to acquire the basic goods and services necessary for [survival](#) with dignity. Poverty also encompasses low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice, and insufficient capacity and opportunity to better one's life" (World Bank, 2011). The World Bank Group is committed to fighting poverty in all its dimensions. This goal is being achieved by the use of latest evidence and analysis to help governments develop sound policies that can help the poorest in every country and focus investments in areas that are critical to improving lives" (World Bank, 2011). Researchers have also identified the role of the world bank group in green financing thereby mitigating flooding for sustainable development in Nigeria (Anabaraonye, Ezuma, Emone, Olisah & Ewa, 2023). In tackling the issues of poverty in Nigeria in the 21<sup>st</sup> century, human development is vital. It is also important for individuals and the government to understand the need to unleash the power of human capital education thereby enhancing innovative ideas for mitigating

the negative impacts of flooding in Nigeria (Anabaraonye, Okon, Adeniyi, Ewa, Nwagbo & Emmanuel, 2022).

### **Climate Change Adaptation And Mitigation Strategies For Addressing Poverty In Nigeria**

Climate change adaptation and mitigation strategies therefore have a great role to play in addressing poverty and ensuring sustainable economic growth in Nigeria (Anabaraonye, Okafor & Eriobu, 2019). The impact of climate change on sustainable economic growth in Nigeria is quite profound (Onnoghen, Orji, Olisah & Anabaraonye, 2024). The impact of climate change is manifest in temperature increase in major cities in Nigeria leading to crop failure. Agriculture is the mainstay of the economy with about 80% of the population in agriculture-based industry and of this, 70% depend directly on rain-fed agriculture. The rural poor constitutes a substantial population of those who depend on the rain-fed agriculture and are faced with new challenges as they operate with limited resources in fragile environment sensitive to shifts in temperature and rainfall patterns. As such, there will be increased reliance on adaptation and development of appropriate mitigation strategies critical for the survival of the people especially women and children who are the most vulnerable. Anabaraonye, Okafor and Hope (2020) identified that climate change education is a vital tool for adaptation and mitigation to the climatic challenges including flooding in Nigeria thereby enhancing sustainable economic growth. They further identified that farmers in rural areas in Nigeria should not be left out of the climate change adaptation and mitigation awareness creation for sustainable economic growth. Women's efforts are very important in confronting climate challenges as they are major producers of staple food crops, estimated at between 60% to 80% of the food crop in Nigeria (DFID, 2009). In addition, women are engaged in most of the postharvest activities especially food processing which is usually affected by flood. The Northern Sahel region which makes up 26.6% of Nigeria's land area today is projected to see a reduction in food production as a result of desertification and the loss of Lake Chad as a significant supply of irrigation water (Boko et al., 2007). Nearly 94 percent of Nigeria's agricultural economy is made up of crops, and certain regions have already noticed a 20 percent reduction in the number of growing days. The growth of maize, guinea corn, millet, and rice are all slowed by temperature increases. For individuals without access to refrigeration, warming trends make it harder to store vegetables and root crops. An increase in the amount and timing of rainfall variability would have a negative impact on Nigerian agriculture. Food insecurity is contingent on farmers' long-standing capacity to anticipate when to sow their crops (CGIAR, 2008). Due to harvest failures brought on climate change impacts such as flooding in Nigeria, farmers are forced to start over with their planting. In addition, severe weather conditions like storms, strong winds, and floods can destroy agriculture and result in crop loss. Pests and agricultural diseases are also increasing in response to changes in the climate (Anabaraonye, Okafor and Hope, 2020).

### **Enhancing Sustainable Economic Growth Through Green Entrepreneurship In Nigeria**

Green entrepreneurship which is among the climate adaptation and mitigation strategies has been discovered to be vital in eradicating poverty and ensuring sustainable economic growth in Nigeria (Anabaraonye, Okafor & Eriobu, 2019). Onnoghen, Onwuzurike, & Anabaraonye (2024) identified the need to enhance climate resilience in Nigeria through green entrepreneurship education thereby eradicating poverty and ensuring sustainable economic growth. According to Afolabi (2015), Entrepreneurship is the manifest ability and willingness of individuals, on their own, in teams, within and outside existing organizations, to perceive and create new economic opportunities (new products, new production methods, new organizational schemes and new product-market combinations) and to introduce their ideas in the market, in the face of uncertainty and other obstacles, by making decisions on location, form and the use of resources and institutions. Green entrepreneurship thus can also be defined as the entrepreneurship that leverages on climate change adaptation and mitigation strategies to create a green economy thereby eradicating poverty (Anabaraonye, Okon, Ewa, Adeniyi & Nwobu, 2022). According to UNEP (2011), Green economy is "an economy that results in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities. The green economy creates opportunities for entrepreneurs and in order to take advantage of this, the employability of young people and women should be improved by providing targeted, up-to-date training in the new skills required in the green economy and by creating incentive mechanisms to encourage green entrepreneurship (Demuth, 2015). The green entrepreneur sees the opportunities created by the transition to green economy and explores these green entrepreneurial opportunities to achieve sustainability economically, socially and environmentally (Anabaraonye, Okafor & Eriobu, 2019). In recent times, the Tony Elumelu Foundation (TEF) based in Nigeria is rising to the clarion call to put a smile on the faces of many Nigerian youths by promoting entrepreneurship including green entrepreneurship and eradicating poverty in Nigeria (TEF, 2021). The Tony Elumelu Foundation (TEF) was founded in 2010 by Tony O. Elumelu, CON, an entrepreneur, investor and philanthropist who is passionate about Africa's sustainable economic growth. The Tony Elumelu Foundation is the leading champion of entrepreneurship in Africa with the objective to empower women and men across the continent, catalyzing economic growth, driving poverty eradication and ensuring job creation. Thus far, the Tony Elumelu Foundation has trained, mentored, and funded over 9,000 young African entrepreneurs across 54 African countries through its Entrepreneurship Programmes, and provides capacity-building support, advisory and market linkages to over one million Africans through its digital networking platform (TEF, 2021).

### **Recommendations:**

- i) There is great need for timely climate change education across communities, cities, companies and campuses in Nigeria especially as it relates to issues of flooding thereby enhancing sustainable economic growth.
- ii) Youths across the nation should be encouraged and empowered by the government at local, state

and federal levels to engage in green entrepreneurship which has numerous benefits thereby eradicating poverty.

- iii) Organizations such as the Tony Elumelu Foundation should be encouraged by the government and other multilateral organizations to continue their great work of emancipating African youths from the shackles of poverty thereby achieving sustainable economic growth.
- iv) Poverty reduction programmes should be intensified to empower the people to strengthen their resilience during extreme weather events. To this end, government should introduce agriculture-based entrepreneurship programmes and incentives in order to forestall the imminent rural-to-urban migration in the aftermath of the flood-induced collapse of rural economies.
- v) Health care is critical to sustainability and adaptation. Healthcare delivery should be improved to provide for the people at all times addressing water vectors diseases and using pesticides to totally eradicate the diseases as a result of flooding in affected regions.

## Conclusion:

There is need to enhance nature education research which will help to mitigate the impacts of flooding for sustainable economic growth in Nigeria (Onnoghen, Idika, Anabaraonye, Ewa & Hope, 2024). Nature education will help communities, cities and campuses to appreciate the beauty and wonders of nature thereby encouraging them to play their part in keeping it clean and green. Furthermore, public awareness campaigns and climate change education are necessary to ensure the people are conversant with the new adaptation and mitigation measures such as use of renewable energy, waste recycling, strategic tree planting activities, etc. thereby mitigating the negative effects of flooding to sustainable economic growth in Nigeria.

## References:

1. Afolabi, A. (2015). The effect of entrepreneurship on economy growth and development in Nigeria. *International Journal of Development and Economic Sustainability* 3(2), pp.49-65.
2. Akukwe T.I, Ogbodo.C(2015) Spatial analysis of vulnerability to flooding in Port Harcourt metropolis, Nigeria. *SAGE Open*. 2015;5(1):1–19.
3. Anabaraonye.B, Ewa.B and Wala.K(2020) The Impacts of Climate Change on Nigeria’s Health Sector and Innovative Solutions for Environmental Sustainability. *EC Agriculture* 6.2 (2020): 01-07.
4. Anabaraonye.B, Okafor, J.C & Hope.J(2020). Educating Farmers In Rural Areas On Climate Change Adaptation For Sustainability In Nigeria. In: W. Leal Filho (Eds.), *Handbook of Climate Change Resilience*, Springer Nature Switzerland Ag
5. Anabaraonye.B, Ezuma.S, Emone.E, Olisah.N.C & Ewa.B.O (2023) The Role of The World Bank Group in Green Financing to Enhance Green Entrepreneurship in Nigeria. *CJOE* (2023) 7 (1) 52-55. <https://journals.covenantuniversity.edu.ng/index.php/cjoe/article/view/3848/1551>
6. Anabaraonye.B, Okafor J.C, & Eriobu.C.M.(2019) Green Entrepreneurial Opportunities in Climate Change Adaptation and Mitigation for Sustainable Development in Nigeria. *Journal of environmental and pollution management*.
7. Anabaraonye.B, Okon.O.E, Ewa.B.O, Adeniyi.T.F & Nwobu.E.A(2022).Green entrepreneurship education for sustainable development in Nigeria. *International Journal of Research in Civil Engineering and Technology* 2022; 3(1): 16-19. <https://www.civilengineeringjournals.com/ijrcet/article/23/3-1-3-106.pdf>
8. Anabaraonye.B, Okon. E. O., Adeniyi.F.T, Ewa.B.O, Nwagbo. S.NC. and Emmanuel.E(2022) Unleashing The Power of Human Capital Education for Sustainable Development in Africa. *J Biotechnology App*. 2022; 1(1); 1-4.
9. Anabaraonye.B, Otti.V, Anukwonke.C.C, Ewa.B & Eslamian.S(2022) Impacts of flooding on Nigeria’s Educational Sector. *Flood Handbook(Principles and Applications)* Edited by Saied Eslamian 2022.Taylor & Francis Group, LLC
10. Boko, M., I. Niang, A., Nyong, C., Vogel, A., Githeko, M., Medany, B., Osman Elasha, R., Tabo and P. Yanda (2007) *Climate Change- Impacts, Adaptation and Vulnerability. Africa. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*.
11. CGIAR(2008). *Consultative Group on International Agricultural Research: The Challenge of Climate Change*; [www.Cgiar.Org/4-6](http://www.Cgiar.Org/4-6)
12. Demuth,A.(2015).Green entrepreneurship: A promising path towards a sustainable future in Tunisia and elsewhere.
13. DFID- Department for International Development (2009), *Impact of Climate Change on*
14. *Nigeria’s Economy. Final Report. February 2009.*
15. Durotoye, B., (1999), *Human Occupation of Hazard Areas in Nigeria*, in: Oshuntokun, A. (Ed.)
16. *Environmental Problems of Nigeria*. Lagos: Friedrich Ebert Foundation Etuonovbe, A.K. (2011). *The Devastating Effect of Flooding in Nigeria* FIG Working Week 2011
17. Folorunsho, R. and L. Awosika, (2001), *Flood Mitigation in Lagos, Nigeria Through Wise*
18. *Management of Solid Waste: a case of Ikoyi and Victoria Islands; Nigerian, Paper presented at the UNESCO-CSI workshop, Maputo 19-23 November 2001.*
19. Ikani D.I(2016) *An Impact Assessment of Flooding on Food Security among Rural Farmers in Dagiri Community of Gwagwalada Area Council, Abuja. Nigeria. Agricultural Development*. 2016;1(1):6–13.
20. Ministry of Environment of Federal Republic of Nigeria (MOEFRN) (2003) *Nigeria’s first national communication under the United Nations Framework Convention on Climate Change. Abuja.*
21. OCHA(United Nations Office for the Coordination of



- Humanitarian Affairs)(2012).Nigeria: Floods Situation Report No. 1 (as of 06 November 2012) p. 1–6
22. Odufuwa BO, Adedeji OH, Oladesu JO, et al.(2012) Floods of Fury in Nigerian Cities. *Journal of Sustainable Development*. 2012;5(7).
  23. Ojigi ML, Abdulkadir FI, Aderoju MO. Geospatial Mapping and Analysis of the 2012 Flood Disaster in Central Parts of Nigeria. Paper presented at the 8th National GIS Symposium, Dammam, Saudi Arabia. 2013.
  24. Olajuyigbe AE, Rotowa OO, Durojaye E(2012) An Assessment of Flood Hazard in Nigeria: The Case of Mile 12, Lagos. *Mediterranean Journal of Social Sciences*. 2012;3(2):366–377.
  25. Onnoghen.N.U, Orji.E.I, Olisah.N.C & Anabaraonye.B.(2024)The impacts of climate change on sustainable economic growth in Nigeria. *Journal of Civil Engineering and Applications* 2024; 5(1): 12-15
  26. Onnoghen.N.U, Onwuzurike.U., & Anabaraonye.B.(2024) Enhancing climate resilience through green entrepreneurship education in Nigeria. *Journal of Civil Engineering and Applications* 2024; 5(1): 33-36
  27. Onnoghen.N.U, Idika.D.O, Anabaraonye.B, Ewa.B.O & Hope.J.(2024)Enhancing Nature Education Research for Environmental Sustainability in Nigeria. *Juniper Online Journal of Public Health*. Vol. 8:5. ISSN:2573-2153.
  28. <https://search.proquest.com/openview/a24db5704be64635bf4fb60ad6e35273/1?pq-origsite=gscholar&cbl=54903>
  29. UNEP(2011) Towards a green economy: Pathways to sustainable development and poverty eradication.Geneva.United Nations Environment Programme.
  30. UNESCO(2015) "Poverty | United Nations Educational, Scientific and Cultural Organization". [www.unesco.org](http://www.unesco.org). Retrieved 4 November 2015
  31. UN(1998) "Indicators of Poverty & Hunger"(PDF). United Nations. Retrieved 27 May 2011.
  32. [https://www.un.org/esa/socdev/unyin/documents/ydiDavidGordon\\_poverty.pdf](https://www.un.org/esa/socdev/unyin/documents/ydiDavidGordon_poverty.pdf)
  33. World Bank(2011) Poverty. <https://www.worldbank.org/en/topic/poverty>
  34. World Bank(2011)Poverty and Inequality Analysis". [worldbank.org](http://worldbank.org). Retrieved 27 May 2011.
  35. World Bank (2012) Cities and Flooding: A Guide to Integrated Urban Flood Risk Management for the 21st Century.