

# Climate Change and Poverty: The Nexus Analysis of North East Nigeria

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## PAPER KEYWORDS    ABSTRACT

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*Climate change is an undeniable fact of human experience all around the globe, particularly in Nigeria. Climate change and poverty refer to the way environmental changes and global warming affect the living conditions, livelihoods, and economic survival of poor and vulnerable populations across regions of the world. Hence, climate change affects poverty in the North East through various interconnected pathways of economic, social and security environments. Using secondary data, the study revealed that the North East region faces serious structural vulnerabilities such as high dependence on agriculture, volatile social infrastructure, terrorism and state failure. Climate change tends to aggravate the existing poverty level in the region rather than create new shocks. This paper, therefore, examines the connection between climate change and the poverty situation in the North East region of Nigeria. It is found that the effect of climate change on livelihoods, agriculture, security, health, employment and the environment cannot be overstated. These effects came as a result of the devastating outcomes of deforestation, flooding, drought, erosion, desertification, and erratic rainfall cycles, among others. The paper recommends that the Nigerian government, as a matter of urgency, make a decisive review of the climate policies capable of arresting the tide of climate adverse effects on the region and also key into the new technologies' adaptation for a better and robust existence of the populations in the region.*

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### 1.1. Introduction

Climate Change without a doubt represents one of the most critical discourse around the World in the 21st century international relations, with an undeniable implications on livelihoods especially in vulnerable regions which affects poverty levels (Adefolu & Uhunmwangho, 2024) In Northern Nigeria, especially the North East region are characterized by arid and semi-arid climates, the impact of climate change are enormous which exacerbating existing issues of poverty and social inequality (NRDC, 2018)

However, the nexus between climate change and poverty in Northern Nigeria manifested in various ways. Hence, changes in climate affect agricultural productivity, water availability and access to resources, which are critical for sustainable livelihoods (Suleiman & Udo, 2021). Hence, the North East region relied heavily on agriculture as

the primary livelihood for most of the population. Climate change phenomena such as rising temperature, erratic rainfall patterns and extreme weather conditions have compounded low agricultural productivity, threatening food security and increasing poverty levels among the populations (Egbende & Ayanlade, 2021). In this regard, the objectives of this study is as follows: To examine the connection between climate change and poverty in North East Nigeria, and to explore how climate change breeds poverty in Nigeria.

### **Literature Review**

Several scholarly writings on Climate Change and poverty exist in the national discourse in Nigeria. These gaps underscore the thrust of this study. However, Friedman (2009), in his work, *The Cost of Climate Change: What We Will Pay if We Don't Act*, noted that climate change can exacerbate existing economic inequalities, leading to a cycle of poverty, especially in developing countries such as Nigeria. Also, (Mastrolillo et al, 2014) in their work *Climate Change and Poverty: A New Agenda for Global Science* stressed that there is an interconnection between climate change impacts and poverty dynamics, suggesting pathways through which climate change effects engendered poverty. Furthermore, (Laczko et al, 2008) *Climate Change, Migration and Development* emphasises the intersection of climate change-induced migration and the resulting socioeconomic impact on communities, creating a cycle of poverty. In (Mastrolillo et al, 2011) *Adaptation to Climate Change: A Review of the Literature and the State of the Art* explore the adaptive capacities and how the lack of adaptation to climate change can entrench poverty in communities, particularly among the younger generations.

### **The Nexus between Climate Change and Poverty in North East Nigeria**

Climate change has a direct connection with poverty in the North East region in several ways. Changes in climate affect not only agricultural output but also water availability and access to resources, which are very critical for sustainable livelihoods globally (UNDP, 2025). Climate change variation in Africa, particularly in Northern Nigeria, adversely affects its productivity and development. These variations in climate affect key sectors of the economy, such as agricultural productivity, water, energy, and transportation, as sources of livelihoods. Plants serve as sources of food production, energy and herbs for the treatment of several diseases. Hence, subsistence agricultural practices have been the means of sustainable livelihoods in the rural communities. This region is dependent entirely on rainfall, which provides water for both humans, livestock and farming (Mastrolillo et al, 2016)

However, these communities have to exchange their assets, such as livestock, for food during drought, pest infestation and disease on crops in order to survive; these conditions have plunged them into abject poverty.

Furthermore, studies have shown that climate change affects the sustainable social and economic development of vulnerable poor regions. It emphasises that since their environment is open to extreme weather conditions, their livelihoods are at stake, thereby plunging them into poverty (Olaniyi, 2020). Other studies stress that the interconnectedness of climate change and food security contributed to poverty levels in the region (Vivan et al, 2012)

Agricultural productivity remains the main stay economy in Northern Nigeria, and the effect of climate change on it cannot be overstated. With surge phenomena of flooding, erosion, drought, pests and diseases, bush burning, rising temperature and erratic rainfall. It is undoubtedly true that agricultural productivity will be very low. The implication is that the low output would ultimately change the supply and demand patterns, as well as the commodity prices (Pittock, 2020). However, the impact of climate change on food production, prices and food security depended on regions' environmental changes, biological effects of rising atmosphere, carbon dioxide, changes in droughts, floods and other extreme weather conditions, existing agricultural practices, adaptive capacity, changes in population, economic growth, and technological innovation (WBGU,2003). Moreover, studies have shown that over eight hundred and fifty (850) million people across the globe are undernourished; it is estimated that this situation will worsen, especially in developing countries such as Nigeria, due to climate change (African Action,2025)

Interestingly, it is crucial to note that fish farming is an essential resource in North East Nigeria, as it provides a considerable amount of income and dietary protein in the country. But changes in temperature, salinity, wind speed and direction, ocean current or waves, strengths of upwelling due to climate change could sharply change the enormous distribution and availability of the fish population in the country. Thus, changes in ocean dynamics could lead to changes in migration patterns of fish, and ultimately reduced fish landings, especially in coastal fisheries (Vivan et al, 2012). It is pertinent to stress that the adverse effects of climate change can be manifested in pests and diseases. The implications of these on agricultural production are massive. Studies have revealed that various pests such as rice sting bug, rice weevil, soybean pod borer and tobacco cutting worm extend their spread areas in the occurrence of climate change. Indeed, an upsurge in the frequency of extreme conditions like protracted drought or severe flooding could create conditions that are favourable to pests and disease outbreaks due to climate change (Vivan et al, 2012)

However, livestock production in the region could be vulnerable to climate change as a result of declining availability of water surface resources for animals, hence the likelihood of a surge in salinity at water resources for animals; possible increase in salinity at water points as a result of a surge in temperature and evaporation, in the face of reduced rainfall. In this regard, climate change causes a reduction of livestock production, and this affects the availability of animal protein such as milk, meat and animal products like hides and skins. This situation has consequences for food security in the country (Ozor & Umehai, 2009). Also, climate change breeds resource conflicts due to struggles for scarce resources. The desertification and deforestation in the region often lead to increasing supply and demand for resources such as food, water and other liquid materials for both human and animal consumption. There were several cases of conflicts between the Fulani herders and the farmers in local environments in Northern Nigeria for struggle over grazing pastures and water areas. Communities of Adamawa and Taraba States have been victims of these conflicts (Adelekan, 2010)

Moreover, climate change escalated desertification and environmental calamities, most especially in the Sahara Desert, to the extent that both local farmers and the Fulani herders struggled to survive. This state of affairs has eroded their capacity to make a

meaningful living (Oladipo & Ojo, 2019). It is important to stress that climate change is not a disaster or calamity but a natural phenomenon with diverse implications for people. To this end, natural disaster phenomena may cause devastating events due to the frequency of human actions such as environmental degradation, like deforestation and urbanisation (Omojola, 2018). In the same vein, research has revealed that climate-related calamities, like disastrous floods or protracted droughts, have immense social and economic effects that can retard years of transformative development. Hence, the protracted drought, which manifested in vegetation damage, low crop production, loss of livestock, extreme temperature and heavy rain downpour, resulted in landslides, and floods contributed to the environmental degradation (Tarhule & Woo, 2009)

However, since the poor often live in areas that are vulnerable to disasters of natural occurrence, they face a higher disaster risk compared to other regions. It is true that poverty levels increase in the affected areas as the personal and household income declined due to the flood catastrophe (Erekpokeme, 2025). It is important to stress that the devastating effects of the flood, especially the 2012 events, affected farmers all over the country, not just Northern Nigeria alone, as so much economic loss was recorded. The flood was described as the worst in recent times because thousands of farmers were not only displaced from their homes but food crops were wiped away, threatening food Security in the country (Abdalla, 2010).

### **Indicators of Climate Change and Poverty**

Environmental changes and global warming have directly affected the living conditions, livelihoods and economic survival of poor and vulnerable populations. Hence, the following are the visible indices of climate change and Poverty in North East Nigeria.

- a. ***Vulnerability of the poor:*** Poor communities often rely on climate-sensitive sectors such as agriculture, fishing and livestock rearing. Indeed, the poor always have zero or limited savings, weak infrastructure and low adaptive capacity when there are shocks from climate change (UNDP,2025).
- b. ***Climate change as a poverty Multiplier:*** This is the situation where there are extreme weather events such as floods, droughts, heat waves, desertification and win storm has destroy crops, homes and sources of income. This situation often leads to a hike in food prices due to a reduction in agricultural productivity. Also, extreme weather events have an adverse effect on the health of the people. The populations were plagued by cholera, malaria, and malnutrition, which affect the poor very hard as a result of weak healthcare delivery in the region (UNDP,2008,2009)
- c. ***Geographical Inequality:*** Developing countries such as sub-Saharan Africa and South Asian countries, where poverty has its headquarters, face stronger climate-related shocks like desertification, rising sea levels, and erratic rainfall. For example, in Northern Nigeria, desert encroachment reduces farmlands, aggravating rural poverty and occasioning migrations which often lead to conflicts between farmers and herders. The farmers/herders conflicts have occurred time without number across Northern Nigeria for decades (Thomas, 2009).

- d. ***Intergenerational Poverty Trap***: Climate Change has reduced opportunities for education, healthcare, and employment. This is because children in climate-affected families or households are often pulled out of school to work for survival, and that entrenches cycles of poverty for later generations (Ajayi & Oladoyinbo, 2019). Hence, climate change exacerbates existing social and economic inequalities, leading to a cycle of generational poverty, particularly in developing countries like Nigeria, and others in sub-Saharan Africa (Mastrolillo et al, 2011)
- e. ***Displacement and Conflicts***: Climate caused by migration, such as refugees, increases urban poverty, as the displaced population crowds into cities for safety and survival. Scarcity of land, water and pasture is fueling conflict between farmers and herders, worsening insecurity and poverty (Israel et al, 2024)
- f. ***Global Inequality***: There is a broad gap between the global North and the global South. The richest countries contribute a lot to ozone layer depletion because of emissions of harmful chemicals from their Industrial plants, yet poor countries in the South bear the brunt of climate change. Thus, this situation further deepens global inequality as developing countries such as Nigeria struggle to adapt with meager resources they have. Hence, this shift in climate change affects agricultural yields, thereby retards economic well-being of the people in the region (Jellason et al, 2019). Albeit, the lack of adaptive capacities of the global South to climate change entrenches poverty in communities in the region (Ojo et al, 2022).

### **The Outcome of Climate Change and Poverty**

***Food Insecurity***: One of the palpable manifestations of climate change and poverty is food insecurity. Food insecurity in Nigeria is a serious threat to its existence. Hence, according to the Global Food Security Index (GFSI), Nigeria is ranked 86th among 107 countries with 33/100 score in 2013. By 2019, Nigeria had ranked 94<sup>th</sup> with a 48.4/100 score (Abraham & Fonta, 2018). Indeed, Nigeria has overtaken India, which was formally regarded as the country with the highest number of people living in extreme poverty globally. Studies have shown that Nigeria has become the global poverty capital with the highest number of citizens living in extreme poverty, up to 86.9 million. Also, the recent findings revealed that the poverty situation in Nigeria has skyrocketed to 102.4 million Nigerians living in abject poverty as of May, 2020. This signifies that an additional 15.5 million people have been plunged into poverty in 24 months (Rusinamhozi et al, 2012). It is germane to note that this precarious situation of food insecurity in Nigeria is informed by chronic and protracted insurgencies in Northern Nigeria.

### **Community Adaptation Strategies to Climate Change in Northern Nigeria**

Rural and poor communities are more vulnerable to the adverse effects of climate change. This is because rural communities are primarily engaged in subsistence farming (Chaillinor et al, 2007). However, due to the poor living conditions, those areas are prone to environmental degradation and natural disasters. In Northern Nigeria, studies have shown that about 30 hectares of farmland are lost to desertification annually

(Grubben et al, 2014). Hence, the poor are more prone to the adverse effects of climate change, and many oppose some measures to mitigate against climate change, if such measures negate their economic and social well-being (Lunduka et al, 2019)

However, the Northern Nigerian farmers have adopted several measures to adapt to environmental change for survival in the midst of rising poverty levels in the region. Such strategies include;

#### ***Crop Diversification:***

Local communities' farmers facing increased environmental change have adopted crop diversification strategies such as mixed cropping and intercropping practices to overcome farm-related risks due to climate change. In this regard, Rusinamhodzi et al demonstrated that intercropping could prevent total loss in farm output as a result of climate change (BNRCC, 2011). Hence, mixed cropping practices under climate change conditions ensure crop diversity and foster resilience since the crops have adapted to local climatic conditions over time (Adepoju & Osunbo, 2018). In the same breath, farmers in drought areas have adapted to indigenous crop varieties that are well-suited for a certain environment when other crops fail. (Salem & Francos, 2012). These farmers have also adapted to practice crop rotation and drought crop resilience in a vulnerable environment to mitigate against production declines. Examples of such crops include wheat, maize, sorghum, Sorghum etc (IAEA, 2010)

#### ***Livelihood Diversification:***

To overcome the adverse effects of climate change, farmers have resorted to diversifying the sources of their livelihood beyond the shores of agricultural practices. This, of course, is critical for poverty reduction measures in poor societies in Nigeria, particularly the northern region. Hence, the off-farm diversification enhances their living conditions and improves their income. Examples, the value chain in products such as cassava from the Southern region, millet and groundnut from the Northern region, by engaging in marketing and sales of these products (Shelton, 2014)

#### ***Livestock Health Improvement Adaptation.***

The importance of animal health cannot be stated. As a result of the adverse effects of climate change, farmers have adopted strategies that can enhance the vitality of livestock health to sustain their productivity and benefit the farmers. However, among the adaptation strategies includes administration of vaccines, planting trees to create shade for the animal, adequate feed formulation, constant supply of water to regulate their body temperature, veterinary services and quarantine services for the sick animal.

Furthermore, farmers have adopted improved breeding measures due to the fact that the majority of the population in Northern Nigeria depends on livestock as a means of livelihood. Albeit, the livestock production is retarded by some factors such as nutrient deficiency, shortage of adequate feed and other emerging threats to their well-being.

It is critical to know that the production of livestock in Northern Nigeria is hampered by climate-related phenomena. Farmers have adapted high-nutrient feed cross breeding of animals. Proper feeding of animals increases their weight, which results in the production of enough meat and eggs, which can enhance food security in Nigeria.



### ***Fish Farming Adaptation Mechanism***

As a result of rising temperatures, which are actually the effects of climate change in Northern Nigeria on water bodies, the population of fish has been reduced, as well as their production capacities. Farmers have adopted fish resilience methods. These adaptive measures involve the use of indoor fish production facilities, such as the construction of Wells and boreholes to supply water, construction of roofs over the ponds. These adaptive strategies have improved their livelihood and living conditions over the years (Shelton, 2014).

#### **1.2. Research Methods**

This study intends to reconstruct the nexus analysis of how climate change affects the poverty levels of the North East region of Nigeria from a historical perspective. The study employed a descriptive and analytical approach using secondary sources of historical data collection models from existing literature on climate change and flooding in Nigeria in the presentation of its analysis.

#### **1.3. Results**

The study finds that the destiny of Northern Nigeria farmers, especially the northeastern region, is solely dependent on community self-adaptation strategies for survival in the midst of escalating climate change adverse effects in the region. It is found that the lack of Government implementation of climate change programs in the region has contributed to the high poverty levels occasioned by climate change effects on agricultural practices. This is the entire region depended on agricultural productivity for its livelihood. The study further discovered that climate change has affected the productivity of both crops and livestock production in the region; by implication, it has plunged the region into abject poverty.

Moreover, the findings show that climate change is not a disaster but a natural hazard which can be aggravated by human activities such as environmental destruction, deforestation and urbanisation. The study further revealed that climate change effects engender a generational cycle of poverty if it goes unchecked.

#### **1.4. Conclusion**

This article examined the nexus analysis of climate change and poverty in North East Nigeria. It revealed that there is a close relationship between climate change and the poverty levels of people in the region. The paper discovered that the adverse effects of climate change have brought an untold hardship and extreme poverty to the Nigerian State. The impact of climate change on agricultural production has reduced the output of crops and livestock, leading to economic vulnerability of the population in the region. Hence, the adaptive resilience of the rural communities in the region has sustained their relative livelihoods.

#### **1.5. Recommendations**

The paper recommends that the Nigerian government should expedite adequate implementation of climate change adaptive programs that would reduce to the barest minimum the effects of climate change in the North East, so as to ameliorate the poverty levels in the region.

Also, the Nigeria decision – makers should promote education of local communities on how to be resilient in the event of shocks from climate change, in order not to fall victim to extreme poverty due to the adverse effects of environmental change.

Nigeria should strengthen flood risk management and protect human lives, as well as property and infrastructure, by adopting cost-effective measures that prioritise managing floods and impacts of climate change to the extent that vulnerable regions can adapt to live with any weather changes.

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