

FOOD SECURITY CHALLENGES IN NIGERIA: EXPLORING THE IMPACT OF CLIMATE CHANGE

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Abstract

Climate change has become one of the dreadful realities of the 21st century and it has made scientists to raise the need to drop global temperatures further by 0.5 °C which will make a significant difference in some regions of the world, particularly developing countries that are faced with the greater threat of climate change. Nigeria is highly vulnerable to the harmful effects of climate change because its landmass of 923,768 sq. km, cut across diverse climatic regions and this has affected its food production activities due to the deforestation problem, desertification, soil degradation, erosion, flooding, general habitat loss, depletion of natural resources etc. And food security can never be achieved when there is no conducive environment and favourable climate conditions for food production. This paper therefore attempts to examine the extent to which continuous climate change has affected food production and how institutional frameworks have addressed or address the current situation in ensuring food security in Nigeria. The research employed qualitative method on a content analysis. The paper frames its arguments in the human security paradigm. Major findings show that environmental degradation, desertification caused by climate change has greatly retarded agricultural production in Africa and in relation to Nigeria; climate change has increased food insecurity in Nigeria. The paper recommends that government should be proactive in tackling the menace of climate change towards food security, there should be reduction of emission of greenhouse gases by stopping deforestation, the use of high yield and disease tolerant crops, and also crops adaptable to high level weather conditions, farmers should be advised to cultivate on time before raining seasons with a view to increasing food production and invest in order to mitigate food insecurity.

Key Words: Climate Change, Food Production, Food Security, Natural Resources, Human Security Paradigm

Introduction

Climate change has become one of the issues that affect the globe, which has brought concern to government and the larger society. Climate change is a direct effect of global warming arising from the increased burning of fossil fuels like crude oil, coal and the production of greenhouse gases (methane, nitrous oxide, carbon dioxide, water vapor etc.) which involves the molecular structure on the atmosphere. Importantly, as a result of the alarming effect of climate change, 195 nations signed the Paris agreement on climate change on 12th December 2015, in other to keep the global temperature rise in the century well below 2 degrees Celsius and to move ways to limit the increase of the temperature to 1.5 degree Celsius above pre-industrial stages. This plan was as a result of the alarming problem the entire world will witness come 2100 with the present temperature level. The Intergovernmental Panel on Climate Change (IPCC) estimated that between 40 and 70% reduction in greenhouse emission would be needed in 2050 compare to 2010 (James, 2012).

Impact of climate change in Africa is higher than US, Russia, Eurasia, Latin America because Africa is more vulnerable to climate change and this has made Africa to account for less than 7 % of the total emissions as per capita, and is less than half of the global average. Nigeria is highly vulnerable to the harmful effects of climate change because its landmass of 923,768 sq. km, cut across diverse climatic regions and this has affected its food production activities due to the deforestation problem, desertification, soil degradation, erosion, flooding, general habitat loss, depletion of natural resources

etc. And food security can never be achieved when there is no conducive environment and good or favourable climate conditions for food production in the country.

Adejuwon (2004) in Idumah, et al (2016) observed that Nigerian agriculture depends highly on climate because temperature, sunlight, water, relative humidity are the main drivers of crop growth and yield. Climate is also a major driver of food system performance at the agriculture end of the food chain. It can affect the quantities and types of food produced as well as production-related income. Gregory, et al (2005) reported that dynamic interactions between and within the bio-geophysical and human environments lead to the production, processing, preparation and consumption of food, resulting in food systems that underpin food security. Thus, there is a palpable misapprehension and trepidation that climate change will affect all four dimensions of food security: food availability, food accessibility, food utilization and food systems stability. It is envisaged that change in climate will have an impact on human health, livelihood assets, food production and distribution channels, as well as changing purchasing power and market flows.

Also, climate change is a main issue that affects the world that is progressively impinging the productivity in agriculture and food security in many areas of the country. The unpleasant effects of climate systems in Nigeria include; the not regular patterns of rainfall; increased level of temperatures; severe weather occurrences etc. cause serious threats to massive production of food to a large extent affecting the well-being of the people generally. Climate change in the country has made the Nigerian government not to have the political will to adopt strategies in mitigating its effects on food security despite several policy meetings over the years. It has greatly affected agricultural practices in much ways.

For instance, it has brought worries in every given the farming season, owing to the changes in rainfall distinctiveness. Climatic condition has brought a strange sequence of crop planting and replanting which in many situations in the country resulted shortage of foods due to high level of harvest failure. The current conditions of the climate leading to heavy winds, and floods, devastate farmlands had retarded the free flow of crop yields. Climatic state has directly affected agricultural availability of products to the markets as well as issues concerning crop yields, crop pests and diseases, and soil fertility. At present, climate change is creating a very serious uncertainty about future temperature and precipitation regimes which makes investments in agriculture and other weather-dependent livelihoods inherent more risky, because it has increased the burden on food security and income among many farmers in the region. It is against this backdrop, the research investigates food security challenges in Nigeria: Exploring the impact of climate change.

Conceptual Review

This aspect looked at literatures that are directly concern the contemporary issues on climate change and Food security.

The Concept of Climate Change

Intergovernmental Panel on Climate Change (2007) defines climate change as “a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period typically decades or longer”. Climate refers to the characteristic conditions of the earth's lower surface atmosphere at a specific location; weather refers to the day-to-day fluctuations in these conditions at the same location (Idumah, et al., 2013).

Aina (2013) holds that climate change is the drastic alteration in the natural components of the atmospheric environment with the resultant adverse responses. It is the shift in weather variations or patterns involving overall and unprecedented changes in weather patterns and includes unusual challenges in rain yield or precipitation, temperature, density or cloud look.

For Jack (2017) the concept of climate change refers to any change in the climate overtime as a result of either of both natural variability and anthropogenic factors. The United Nations Framework

Convention on Climate Change (UNFCCC, 1992) refers to climate change as “a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparative time periods”. Climate change is a direct consequence of global warming due to increasing burning of fossil fuels such as crude oil, coal and concentration of greenhouse gases (GHG) which are capable as a result of its particular molecular structure of absorbing infrared radiation or heating the atmosphere (Onuoha & Ezirim, 2010 cited in Omoro, et al., 2016).

Food Security

According to FAO (2003) in Azad & Kaila (2008) Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. The World Food Summit (1996) defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life”. Commonly, the concept of food security is defined as including both physical and economic access to food that meets people's dietary needs as well as their food preferences.

The USDA opined that “food security for a household means access by all members at all times to enough food for active, healthy life. Food security includes at a minimum, the ready availability of nutritionally adequate and safe foods, an assured ability to acquire acceptable foods in socially acceptable ways (i.e. without resorting to emergency food supplies, scavenging, stealing, or coping strategies)”. Food security is built on three pillars:

- a. Food availability: sufficient quantities of food available on a consistent basis.
- b. Food access: having sufficient resources to obtain appropriate foods for a nutritious diet.
- c. Food use: appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation (cited in El-ladan, 2014).

Food security entails ensuring sustainable access, availability and affordability of adequate quantity and quality food to all citizens to meet up with their physiological requirements (Okuneye, 2014). When employed at the level of individual household members, food security implies an intake of food and absorption of nutrients sufficient to meet differential individual needs for activity, health, growth and development. Individuals within households with sufficient resources to provide adequate food may still lack appropriate and sufficient food because of occupational lifestyle demands as well as inadequate nutritional knowledge. The availability of food to individuals within the household may also be constrained by the prevailing religious, social and cultural norms in (Terso & Ogochukwu (2014).

Nigeria Climate Change

Nigeria like other countries of the world has its own experience of climate change disasters like the one that struck 25 years ago in the north-eastern region at present comprising Borno and Yobe states, the southern part of Lake Chad, the section of it that lies inside Nigerian territory dried up (Jumoke2016). Some four decades ago, the Lake covered an area of over 40,000 square kilometers, whereas it now encompasses a mere 1,300 square kilometers. While the negative trend continues unabated and as land is laid to waste by the rising temperature leading to the rapid southward expansion of the Sahara Desert; farmlands and surrounding villages are becoming barren, being swallowed up by advancing desertification. This led to massive migration of people in search of more fertile terrain from the north east towards the greener plateau and middle belt regions. Growing desertification has forced thousands of Fulani herdsmen to move south to the middle belt region where they clash with crop farmers over access to land for grazing culminating in death of hundreds according to the reports of residents and activist Yakubu Muhammad.

Nigeria's Guinea Savannah region is not spared either. Logging and over dependence on firewood for cooking have stripped a greater part of this area of its vegetation cover. The situation is similarly replicated in the south, where the forest around Oyo has long been reduced to grassland. The

south – eastern part of the country has been struck by a different ill. There, gulley-erosion has devastated many settlement areas and farmlands, leading to poverty among local populations. And, it does not stop there. Just as desertification is devastating vast areas of the north, rising sea levels are threatening Nigeria's coastal regions. The Niger Delta's low-lying terrain and criss-cross of waterways make it extremely vulnerable to flooding, from rising sea level. As an oil producing areas also a victim of environmental pollution arising from oil production activities. Moreover, in the southern Nigeria, climate change is also reflected in the massive flood experienced in 2012, houses, farms, farm products, properties and even human beings were swept away. Also the statistics released by the southwest zonal office of the National Emergency Management Agency (NEMA) about 2 years ago show that no fewer than 5000 persons were affected and 60 houses destroyed in a windstorm which occurred in four states in the south-west region.

The West Africa Network for Peace-building Nigeria noted in its 2017 report based on a study conducted in Kebbi and Adamawa states that the climate change has brought additional uncertainty and risk to Nigeria's largely small-scale food system (Jimor, 2018). It said that the expanding desert belt along deforestation have reduced the amount of land available for farming, and that decline in rainfall at a rate of 3 to 4 percent per decade has negatively impacted crop yields. "A shortening of the rainy season means a fewer opportunities for planting, and the lack of storage facilities have resulted in post-harvest losses to up to 40 per cent. Climate change could decrease Nigeria's economic productivity by up to 11 percent by 2020, and up to 30 per cent by 2050. Agricultural productivity is projected to decline by 10 to 25 per cent by 2080, and by 50 percent in some northern regions. A similar picture emerges in Kebbi and Adamawa states, where about half of farmers spoke of declining harvest, cultivated area and production yields due to climate variability and extreme weather events. Farmers are losing livestock, crops and vegetables are washed away in flooding and fish do not survive in warmer temperatures. Drought and windstorms are also causing produce losses, such as potatoes. These signify a loss of livelihood for these farmers. According to the reports, running a small-scale farm in Nigeria is an uphill battle against many constraints, including costly farm input, lack of information, limited access to technology, credits, markets and land tenure problems. It said that there is a clear disconnect between policy intention and the services that farmers are actually receiving.

Climate Change Policy

Climate change has been one of the contemporary environmental issues in the 21st century and it has showed a high risk to the main supply of fresh water, the production of food mechanism, economic development, and effective maintenance of the resources. Policies in the fight against climate change is paramount for the overall development of a country and the ability of government to formulate and enact climate change policies and the protection of the agriculture sector will be a key issue in the move towards climate change consequences.

One major policy of the Nigerian government in the fight against climate change is the National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN (Eke, 2016). This strategy envisions a Nigeria in which climate change adaptation is an integrated component of sustainable development, reducing the vulnerability and enhancing the resilience and adaptive capacity of all economic sectors and of all people particularly women and children to the adverse impacts of climate change, while also capturing the opportunities that arise as a result of climate change. Some of NASPA-CCN strategies for the agricultural sector includes: Increase access to drought-resistant crops and livestock feeds; adoption of better soil management practices; provision of early warning/meteorological forecasts and related information; increase planting of native vegetation cover and promotion of re-greening efforts.

Another major government policy with direct bearing on climate change is the National Policy on Environment. The goal of the National Policy on Environment is to ensure environmental protection and the conservation of natural resources for sustainable development. The strategies for the agricultural sector includes: Ensure that mandatory Environmental Impact Assessments is carried out for all major

agricultural development projects; encourage and support ecologically appropriate livestock and poultry production; encourage conservation of grazing reserves and enforce strict range resource management programmes; regulate the production, use, storage, transportation, sale and disposal of agricultural chemicals; monitor pesticide and agro chemical residue levels in air, soil, water and document the environmental fate of such chemicals; promote farming, using manures and other soil nutrients. Agro-chemicals, pesticides, inorganic fertilizers are all major contributors to the production of greenhouse gases, hence regulation of their production and usage go a long way in climate change mitigation and adaptation.

National Environmental, Economic and Development Study for Climate Change in Nigeria (2010, p.10) Nigeria has also enacted a number of specific policies and action plans for the implementation of the National Environment Policy. These policies that could be adapted to support national climate change mitigation and adaptation response efforts include (i) National Policy on Drought and Desertification; (ii) Drought Preparedness Plan; (iii) National Policy on Erosion, Flood Control and Coastal Zone Management; (iv) National Forest Policy; and (v) National Biodiversity Strategy and Action Plan. In addition, Nigeria has many laws and regulatory measures to promote sustainable environmental management in many sectors of the economy. Some of the critical laws that may have influence on climate change response, particularly as they relate to ecosystem adaptation, include (a) National Park Service Act – retained as Cap N65 LFN 2004 (for conservation and protection of natural resources (wildlife and plants) in national parks; (b) Endangered Species (Control of International Trade and Traffic) Act- retained as Cap E9 LFN 2004 (conservation of wild life and protection of threatened and endangered species).

The National Agricultural Resilience Framework (NARF) was mentioned in Nigeria's Intended Nationally Determined Contribution (INDC) document as a policy which is very important in the fight against climate change. Some of the objectives of NARF includes: Strengthening the overall policy/institutional framework for improved resilience and adaptation to climate variability and change in the agricultural sector; evaluation and introduction into the agricultural sector of risk transfer and risk management strategies like improved seasonal and real-time weather forecast; improving productivity through training community and grass root farmers on land and water management strategies like irrigation farming, water harvesting, erosion control; reinforcing existing social safety nets through support systems that reduce vulnerability and improve livelihood conditions for the vulnerable especially women and children.

The Muhammadu Buhari led government also launched the Agricultural Promotion Policy (APP). The thrust of the APP relevant to climate change includes: boosting public awareness through advertising of importance of climate-smart agriculture. Also institutional linkages and partnerships will be strengthened for ensuring climate smart agricultural governance, legislations and financial mechanisms; environmental impact assessment will be carried out on major agricultural projects; the use of renewable energy will be promoted with the involvement of private sector; broad public and stakeholder awareness on climate smart agriculture will be created; government will facilitate soil map to improve land use and management practices; government will increase the adoption of global best practices on climate change, including the aspects of adaptation, mitigation and carbon credit.

However, if these measures are properly and fully implemented, they will definitely serve as adaptive measures in addressing climate change effects. But Nigeria is still looking into the full ways of addressing the climate change policies because the current National Development Plan otherwise the Vision 20: 2020 which articulates Nigeria economic growth and development strategies for a ten-year period between 2010 and 2020, which will help to position the country to be top 20 economies in the world by 2020 is still on course.

Institutional Framework and Strategies for Climate Change in Nigeria

Nigeria has created a Special Climate Change Unit (SCCU) within the Federal Ministry of Environment with the Secretariat in Abuja, Nigeria. The Unit is created to implement the Convention

and the protocol activities. The SCC Unit also has responsibility of coordinating the activities of the Inter-ministerial Committee on Climate Change with representation from the following ministries; Finance, Agriculture, water Resources, Energy Commission, Nigeria National Petroleum Corporation (NNPC), Foreign Affairs, Nigerian Meteorological Agency (NIMET), industry, NGOs (Nigerian Environmental Study/Action Team), and Academic (Centre for Climate Change and Fresh Water Resources, Federal University of Technology Minna; Centre for Energy , Research and Development, Obafemi Awolowo University Ile-Ife; and Abubakar Tafawa Balewa University, Bauchi.

There is also a Presidential Implementation Committee on the Clean Development Mechanism (CDM) in the Presidency. Towards improving the national capacity to generate observational climate data and climate monitoring systems, government upgraded the Department of Meteorology in the Ministry of Civil Aviation to a full-fledged Nigerian Meteorological Agency (NIMET) in 2003, which now has a Climate Research Unit for data generation and climatic information dissemination. Within the democratic political system of the country, the Senate has a standing committee on ecology (Senate Committee on Ecology) while the National House of Assembly has a standing Committee on Climate Change. Members of these Committees have facilitated the passing of a Climate Change Commission (CCC) Bill in both the House and Senate. However, there is still no timeframe as to the time the CCC will take off. In addition to the Committees, there is a National Council on the Environment, made up of representatives of governments at the Federal and State levels. The Council meets at irregular intervals to take stock of the state of the environment in Nigeria (National Environmental, Economic and Development Study for Climate Change in Nigeria 2010).

There have been calls to establish a national climate change commission that would coordinate climate issues nationwide (Ekpoh, 2014). A bill on setting up the commission however is yet to be approved. In the meantime, there is the Department of Climate Change, within the Federal Ministry of Environment, that is responsible for the handling of climate change issues. The Federal Government of Nigeria has also established the National Climate Change Trust Fund and the Environmental Sustainability Group to design and attract financing mechanisms for adaptation initiatives (AAP Nigeria, 2016). Given its recent adoption, it is yet to be seen if there is need to increase the capacity of the policy to improve reduction of greenhouse gases and what lessons, if any, there are for possible adoption/adaptation by other countries (Nigeria Emission Reduction Policy, 2016).

Reasons Attributed to the Successes and Failures of Climate Change Impacts on Food Security in Nigeria

Areas of Successes

1. **The Measures on Adaptation:** The Nigerian government, along with several NGOs and international organizations, has executed several adaptation programs aimed at improving agricultural resilience. For example, the establishment of the Agricultural Transformation Agenda (ATA) has promoted the use of climate-resistant crops.
 - The encouragement of improved seed ranges and practices has led to increased yields. For instance, the adoption of drought-resistant maize varieties has shown an increase in productivity by up to 30%.
2. **The Different Investment Patterns in Irrigation:** Several efforts have been made to increase irrigation conveniences. According to the National Irrigation Policy, Nigeria aims to increase its irrigated land from around 1.2 million hectares to about 2.5 million hectares by 2025, reducing reliance on rain-fed agriculture.
3. **The Strategies Adopted on Food Security:** Nigeria's National Policy on Food Security aims to guarantee accessibility, convenience, and affordability of food. Nigeria has formed programs like the Anchor Borrowers' Programme (ABP), which provides financial support to many farmers in order to reduce poverty and look up to the improvement on food production.

4. Policy Trust on the Engagement Youth: Several plans targeting youth in agricultural activities have been launched, which include the National Youth Agro-Entrepreneurship Programme, which encourages young Nigerians to engage in farming, thus potentially increasing the level of food production and enhancing food security measures in Nigeria.

Areas of Failures

1. The Serious level of Declines on Crop Yield: Several studies indicated that climate change has led to a decrease in crop yields in Nigeria. The International Food Policy Research Institute (IFPRI) projects that by 2050, maize yields could fall by 16-30% due to rising temperatures and erratic rainfall patterns or levels.
2. The High level of Increased in Food Prices: It is important to note that, the rise and fall in crop production have contributed to food price unpredictability. In recent years, food inflation in Nigeria has been significant. In 2021, food inflation reached around 20% amid rising costs attributed to climate impacts and insecurity within different parts of the country.
3. The Current Conditions in Poverty and Malnutrition: Climate change worsens poverty levels and malnutrition in Nigeria. As of 2020, the World Bank reported that about 82 million Nigerians were in extreme poverty level, and the impact of climatic condition on agriculture and food systems could worsen this situation.
- The prevalence of stunting between children fewer than five remains high, with approximately 36% reported in 2021, with food insecurity linked to climate change contributing to these rates.
4. The issue of Degradation on Lands: Land degradation, driven by climate change and indefensible agricultural practices, poses a harsh problem to food security. The Food and Agriculture Organization (FAO) estimates that 40% of Nigeria's land is degraded, impacting agricultural productivity.
5. Problem of Conflicts and Displacement Situations: Climatic condition has been connected to increased differences over resources, predominantly among farmers and herders. Studies have indicated that the occurrence of conflicts has risen, mainly in northern Nigeria. This instability disrupts agricultural activities, additionally, threatening food security.

Methodology

Research Design

The study adopted descriptive research which enables the study to describe issues that affect climate change on food security in Nigeria. Also, this design helps to determine the features of the problem by establishing the identified challenges of climate change on food security.

Population and Sample

The population for this study is 234,322,841 Nigerians based on Worldometer's elaboration of the United State current data. While the sample size is Bayelsa state which helps to justifies the climate change impacts on food security.

Method of Data Collection and Analysis

The method used for the collection of data was purely on secondary means, whereby information from the research were gotten through textbooks, internet sources, magazines, journals, etc. On the other hand, the data was analyzed through qualitative method and analysis of records.

Theoretical framework

This paper uses the human security paradigm to frame the relationship between climate change and food security in Nigeria. The human security approach was first made known by what is called MahbubulHaq in the United Nations Development Programmes in 1994 Human Development Report. Lincold (1995) posits that human security focuses the concept of security on human survival, wellbeing and freedom. He conceptualizes human security as the objective, the ultimate ends of all security concerns and other forms of security, such as military security, is not ultimate goals. Rather it is a means of achieving the ultimate objectives of human security.

According to Gomez & Gasper (2014) the human security approach broadens the scope of security analysis and policy from territorial security to the security of people. The 2012 General Assembly Resolution stresses the role of “Member States in identifying and addressing widespread and cross-cutting challenges to survival, livelihood and dignity of their people”. In other words, threat(s) to – and values under threat in – people's lives are the key starting point of a human security report.

The 1994 HDR highlighted two major components of human security: 'freedom from fear' and 'freedom from want'. These freedoms, from the preamble to the Universal Declaration of Human Rights, are part of the four human freedoms that President Franklin D. Roosevelt famously referred to in a speech in 1941. He was advocating a world founded on: freedom of speech and expression, freedom of worship, freedom from want and freedom from fear.² Subsequent debate in the 1990s added the freedom 'to live in dignity'. The 1994 HDR was more specific, listing seven essential dimensions of human security: Economic, Food Health, Environmental, Personal, Community, Political.

This list is neither comprehensive nor definitive, and the UN Charter refers more flexibly to 'fundamental freedoms'. National and regional HDRs aiming to address varying categories of threats and values can use the human security approach in analyzing the topic. Previous reports based on the human security approach have, for example, dealt with social exclusion, modernization and climate change; they have used examples where the State has been a threat; or explored possible future threats. Human security is a flexible approach and can be tailored to different contexts and topics, according to the specific context. No matter which topic is addressed, a guiding principle of the human security approach is that it requires understanding the particular threats experienced by particular groups of people, as well as the participation of those people in the analysis process. Threats to human security can exist at all levels of development. They can emerge slowly and silently or appear suddenly and dramatically. Central to the approach is the idea that people have 'the right to live in freedom and dignity, free from poverty and despair with an equal opportunity to enjoy all their rights and fully develop their human potential.

Importantly, human security centers on the underlying factors for sustainable development and it is a means of attaining a complete livelihood and even development. Human security is purely on the people, communities and the human environment, because the overall goal of the human being is the ability to secure food and live in better climatic conditions. The approach is relevant because it will help in encouraging the adoption and sustainable use of agricultural inputs in various farms, applying home based agricultural extension services to securing food production and control of climate change, engagement of able youth in agriculture activities towards food security in Nigeria. Human security is fundamentally on people-focus involves also building people's skills and capacities to deal with the problem of insecurity. That is, the process of securing people within the context of the communities that involves the empowerment of people.

Application of Theory to the Study

Applying Human Security Theory to the food security challenges coupled to climate change in Nigeria demonstrates the interconnectedness of environmental and socio-economic factors that contribute to insecurity in Nigeria. By dealing with these challenges comprehensively, Nigeria can work towards a more durable food system that prioritizes the well-being of its people, particularly those most vulnerable to the impacts of climate change. Sustainable practices, local level of empowerment, and efficient governance will be decisive in safeguarding human security in the face of climate challenges.

Human Security theory emphasizes the safety of those people and communities from various types of threats to their well-being, ranging from economic and food insecurity to environmental disasters and violence. It widens the concept of traditional security, which usually focuses on state security and military concerns, by stressing the interconnectedness of issues that affect people's lives. When applying Security framework to the food security challenges posed by climate change in Nigeria, several key aspects emerge and include governance and institutional response; community empowerment and resilience; social stability; food, environmental and economic security, etc.

Conclusion

The study revealed that Nigeria is highly vulnerable to the harmful effects of climate change because its landmass of 923,768 sq. km, cut across diverse climatic regions and this has affected its food production activities due to the deforestation problem, desertification, soil degradation, erosion, flooding, general habitat loss, depletion of natural resources etc. Based on these, food security can never be achieved when there is no conducive environment and good or favourable climate conditions for food production. More so, climate change is creating increased uncertainty about future temperature and precipitation regimes which makes investments in agriculture and other weather-dependent livelihoods inherent more risky and has increased the burden on food security and income among many farmers in the Nigeria.

Recommendations

The research recommends the following ways in addressing the challenges of climate change and how to improve on food security in Nigeria.

- a. The federal government should implement fully on the new policy framework that will help to develop a comprehensive and mutually beneficial packages to both pastoralists and farmers
- b. Government should provide practical steps in tackling the menace of climate change towards food security
- c. There should be reduction of emission of greenhouse gases by stopping deforestation, the use of high yield and disease tolerant crops, and also crops adaptable to high level of weather conditions
- d. Farmers should also be encouraged to cultivate on time before the rain seasons with a view to increasing food production and invest in powers to mitigate food insecurity
- e. Federal and states ministries of environments should create awareness to every regions on the implication of climate change on food security
- f. Government should provide more funding on climate change and food security research
- g. Government should increase food production in every region

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