

# Government Strategies on Climate Change in Nigeria

**Pius Olakunle Osunyikanmi (Ph.D)**

Director General /CEO Directorate of Nigerian Technical Aid Corps,

Jabi Abuja-Nigeria

Email: osunyikanmi2003@yahoo.com

Phone: +2348034711143

## **Abstract**

*This paper examines the impact of climate change in Nigeria and the government strategies on its mitigation. Climate change has impacted negatively on the global environment due to natural and man-made factors which have become a major concern to the Nigerian government. Nigeria with a known vast land space of 923,768 Sq km spanning across diverse climatic areas is considered to be highly vulnerable to climate change. The issue of Climate change arises through the increased burning of fossil fuels such as crude oil, coal and concentration of greenhouse gases (GHG) and through the molecular system of absorbing radiation. More so, the greenhouse gases are carbon dioxide, water vapor, methane, ozone, loss of plants as a result of deforestation. The research employed qualitative approach and uses content analysis. The study frames its arguments from the human security paradigm and the study finds that Nigeria position in supporting adaptation and mitigation measures towards climate change is yet to be fully realized. It also revealed that the Nigeria policy framework for aligning human development and climate change management still stands undeveloped; Nigeria also contributes minimally to greenhouse gases (GHG) emissions. The paper recommends among others the need to implement the national climate policy development framework; Government should have the political will to create awareness on the effects of climate change in Nigeria.*

**Keywords:** Climate Change, Environment, Human Security, Mitigation, Strategies

## **Introduction**

Climate describes the weather pattern of a place over a period of time, which ranges from 30 to 40 years. The parameters commonly used for this description include average atmospheric temperature, precipitation, days of sunlight, wind pattern and other variables that might be measured at any given site. Weather is the day-to-day state of the atmosphere, and is a chaotic non-linear dynamical system while climate which is the average state of weather is fairly stable and predictable. The weather of a place describes the condition of the atmosphere for a short period of time and it varies from a few hours to days. However, both weather and climate are inherently variable and it is the consistency of the weather pattern over time which bestows climatic character on a place. Climatologists describe the climate of a region as its average weather characteristics for a minimum of 35 years even though extreme atmospheric conditions also influence the weather of a place in Saibakumor (2014: 5). In the past 900,000 years of the 4.7 billion years of the earth, we have witnessed prolonged period of global cooling and warming. Thick layers of glacial ice covered vast areas of the earth's surface for about 100,000 years during the cold or glacial periods in which there was a

significant decrease in atmospheric temperature. These glacial periods alternate with warmer interglacial periods which last for between 10,000 and 12,500 years with significant increases in the temperature of the atmosphere. The variation in the temperature of the atmosphere results to the phenomenon called climate change. Cited in Chidi (2017).

Climate changes reflect variations within the earth's atmosphere, processes in other parts of the earth such as oceans and ice caps, and the effects of human activity, climate change is any long-term significant change in the 'average weather' that a given region experiences. Average weather may include average temperature, precipitation and wind patterns. It involves changes in the variability or average state of the atmosphere over durations ranging from decades to millions of years. These changes can be caused by dynamic process on earth, external forces including variations in sunlight intensity, and more recently by human activities. (Akpofure: 468).

Climate change has impacted negatively on the global environment due to natural and man-made factors which have become a major concern to the Nigerian government. Nigeria with a known vast land space of 923,768 Sq km spanning across diverse climatic areas is considered to be highly vulnerable to climate change. The issue of Climate change arises through the increased burning of fossil fuels such as crude oil, coal and concentration of greenhouse gases (GHG) and through the molecular system of absorbing radiation. More so, the greenhouse gases are carbon dioxide, water vapor, methane, ozone, loss of plants as a result of deforestation in Idoniboye-Obu and Sapele (2018).

For Adeyeye (2018) globally, climate change has adverse impact on food security but while developed nations can easily militate against this challenge by adopting technologies to scale up agricultural productivity, developing nations with the world poorest people experience difficulty in tackling the impact of changing temperature. The Food and Agricultural Organization (FAO) in 2015 revealed that the vast majority of the world's hungry people live in developing countries with sub-Saharan Africa having the highest prevalence of hunger. A decline in agricultural productivity will further compound food crisis in Nigeria.

Climate change has become one of the dreadful realities of the 21<sup>st</sup> century. Former President Barack Obama while delivering his state of the Union Address on January 20<sup>th</sup> 2015 noted that 'no challenge poses a greater threat to future generations than climate change'. In 2016 alone, incessant rainfall that caused flooding killed hundreds of people in Asian countries of Bangladesh, Nepal and India. In Africa, heavy rainfall causing flood affected Nigeria, Sudan, Mozambique, South Africa, Niger, Burkina Faso, Senegal, Mali and Ghana between June and September. East Africa countries of Somalia and Ethiopia are constantly threatened by drought. On 12<sup>th</sup> December 2015, 195 nations signed the historic Paris agreement on climate change which aims to 'keep a global temperature rise in this century well below 2 degrees Celsius and to drive efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels'. This move was accentuated by the looming crisis the world will face in 2100 with the current high rate of temperature. Already, the last ten hottest record of high temperatures occurred in this century and 2016 marked the hottest year in global temperature since record keeping began. The Intergovernmental Panel on Climate Change (IPCC) already estimated that between 40 and 70% reduction in greenhouse emission will be needed in 2050 compared to 2010. Adeyeye (2012:2).

Despite the progressive and ambitious targets of the Paris agreement, scientists have raised 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. Already some experts warned that current levels of warming are already causing impacts beyond the current adaptive capacity of many people and that there would be significant residual impacts even with 1.5 °C of warming.

In Nigeria, Eze, Ikeogu, Iwu and Nwakama (2012) affirmed that environmental devastation arising from climate change is becoming rampant in many parts of the country. For instance, they noted that current environmental problem in the Niger Delta is flooding which comes from rainfall and runoff from rivers and urban chains, tidal movement and wind. The situation in Nigeria was vividly captured when they stated thus:

Climate change or global warming has become a new reality with deleterious effects: seasonal cycles are disrupted as are ecosystems and agriculture, water needs and supply, and food production are adversely affected. Global warming (climate change) also leads to sea-level rise with its attendant consequences, and includes fiercer weather, increased frequency and intensity of storms, floods, hurricanes, droughts, increased frequency of fires, poverty, malnutrition and series of health and socioeconomic consequences (p. 69). Cited in Osuafor and Nnorom , 2014 : 211).

Thus, according to Okebukola and Akpan (2009), the causes of climate change can be divided into two categories – those that are due to natural causes and those that are created by humans. Prominent among the natural causes are continental drift, volcanoes, ocean currents, the earth's tilt, comets and meteorites. Agbo (2012) maintained that the major contributory factors of climate change are man-made. This is line with Nzewi (2009) who stated earlier that current knowledge will suggest that about 60% of the climate change is attributed to such human activities as altered land use, deforestation, agricultural and industrial activities, wars and increasing energy consumption. Others include use of fertilizers, burning of fossil fuels, refuse dumps, automobiles and through domesticated animals (Agbo, 2012). All these result to the emission of greenhouse gases, some of which include carbon dioxide, methane, nitrous oxide and ozone (O<sub>3</sub>). Because greenhouse gases absorb and emit heat, increase in their concentration in the atmosphere tend to have a warming effect leading to climate change (global warming) which is now causing more heat waves, drought and flooding as well as threatening food and water supplies in Osuafor and Nnorom , 2014 : 210).

The research employed qualitative approach and uses content analysis towards investigating the impact of climate change in Nigeria and also examined the government strategies on its mitigation. More so, *the study utilized mainly secondary sources of data collection to make critical analysis in the study.*

### **Conceptual Clarifications**

Some concepts would be examined as to ascertain the impact of climate change in Nigeria and the government strategies on its mitigation.

### **Climate Change**

According to Rahman (2013:2) 'Climate Change', the most uttered environmental term of present time has been used to refer to the change in modern climate brought predominantly by human being. It is perhaps one of the most serious environmental issues that today's world population facing though the issue is not new. Ever since it emerged in the early nineteenth century, up to late twentieth century the issue was a topic discussed exclusively within the scientific society. In the mid to-late 1980s it first emerged on the public agenda. Since then, in one hand, it has been manifested by the believers that consequence of human activities on world climate has reached to an alarming state and posing critical threat to physical, socio-economic structures. On the other hand, the sceptics have presented fairly enough evidence to disqualify the anthropogenic trait of Climate Change. Again, the Climate Change advocates among them have debated over the appropriate methods of addressing the eminent issue. Thus with increasing public involvement in the Climate Change discourse and ensuing awareness regarding the potential risks and uncertainties attached to the issue, it has been debated and problematized from diverse standpoints.

Climate change is defined as fluctuations in the patterns of climate over long periods. Intergovernmental Panel on Climate Change (IPCC, 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. Although the length of time it takes the changes to manifest matters, the level of deviation from the normal and its impacts on the ecology are most paramount cited in Terso and Ogochukwu (2014).

For Aina (2013) 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, which may include unusual challenges in rain yield or precipitation, temperature, density or cloud look. It is necessary to make a distinction between climate change and global warming as the two are neither the same nor synonymous. Global warming narrowly addresses an aspect of climate change, while climate change has a wider range of causes than global warming. The latter has a limited effect when compared with the former, though the two have the commonality of temperature changes.

The United Nation Framework Convention on Climate Change, (UNFCCC, 2005) define climate change as 'A change of climate, which is attributed directly or indirectly to human activity, that alters the composition of the global atmosphere, and in addition to natural climate variability, observed over comparable period of time. The most general concept of climate change therefore, is a 'change in the statistical properties of the climate system when considered over a long period of time, regardless of the cause'. Accordingly, fluctuations over periods shorter than a few decades do not represent climate change. The term is, sometimes, used to refer specifically to climate change caused by human activity, as opposed to changes in climate that may have resulted as part of the earth's natural processes. In this respect, especially in the context of environmental policy, the term climate change has become synonymous with anthropogenic global warming. However, scientifically, global warming refers to surface temperature increases while climate change includes global warming and everything else that increasing greenhouse gas levels will affect. Thus, simply put, Climate change is a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the globe. In recent usage, climate change usually refers to changes in modern climate cited in El-Ladan (2014).

### **Climate Change Causes and it Impact in Nigeria**

There is a global consensus about the causes of climate change. It is generally agreed that climate change is instigated by human activities. A chief contributor is the global over-dependence on the use of fossil fuels to meet energy needs. The use of fossils leads to the release of greenhouse gases (GHGs), mainly carbon dioxide (CO<sub>2</sub>) and methane into the earth's atmosphere. Fossil fuels are mainly produced from natural gas. They all release CO<sub>2</sub> at production and consumption points. Fossil fuels constitute the primary source of energy to the world's economy, and have been utilized in power generation, transportation, agriculture, manufacturing, land use and other activities. For instance, petroleum, diesel and gas are used to power plants to generate electricity. But beyond public electricity generating power plants, Nigeria relies more on the use of generators to generate household and industrial electricity supplies. Nigeria is the largest importer of electricity generators in the world (Fagbemi and Idoko, 2009) cited in Aina (2013).

El-Ladan (2014) Changes in temperature and rainfall are likely to result in spatial shifts in patterns of agriculture, and in crop yields, which may have considerable socio-economic impacts. Supply of, and demand for fresh water may also be significantly affected. Small Islands will disappear and salt water

intrusion will also result from the sea level rising and coming in. Rivers and coastal aquifers will become salty, threatening drinking- water supplies in many coastal towns and cities. Warmer climates and wetter conditions predicted by global warming will help malaria-carrying mosquitoes to breed with vigour and may result in their spread into temperate regions and higher altitudes, which will no longer be the refuges from the disease that they once were. Besides, rainfall, temperature and humidity have a major influence on the distribution of pests, parasites and pathogens as well. Water borne diseases such as typhoid, cholera and dysentery thrive during floods; and droughts bring diseases associated with poor water quality and inadequate sanitation. Flooding will exacerbate these problems because it becomes much more difficult for people to get to clinics, or for health workers to get to distant villages. Immunization campaigns and other public health measures will also be disrupted. Biodiversity loss through habitat loss, consequence of climate change, will certainly be catastrophic to humanity. Imagine, with only 8 crops supplying 85% of the world's food, wildlife taken from the forest providing bulk of the animal protein that is consumed in many countries, about 2 billion people cooking with fuel wood, and developing countries (in 1983 alone) importing some US\$10 billion worth of forest products. The ultimate negative impacts of climate change on World food supply and economy are, therefore, best imagined.

Olufemi (2018) posits that the year 2017 witnessed series of climate-related disasters in Nigeria, ranging from the increased health risk, declining agricultural productivity, biodiversity loss, drying lakes, famine, conflicts or social unrest, poverty, worsening food insecurity situation, heat stress, declining soil capacity for agricultural production, increased natural disaster, extreme weather events, among others. One of the major country-specific effects of climate change in Nigeria is declining agricultural productivity, which is due to the irregular, unpredictable farming calendar. The usual April-October rainy season and the October-March dry season is no longer a constant as it has been for some decades now. Farmers now plant in the midst of great uncertainties, thus resulting in untold losses, for their investment waste away from lack of rainfall at the right time.

Consequently, this result in decline in productivity, and the income of Nigerian farmers, as well as a likely fall in the agriculture share of GDP, which stands at 29.15% of Q3-2017 GDP figure (NBS) and employment.

The Agricultural Promotion Policy (APP), of the current federal government, reviewed the Agricultural Transformation Agenda (ATA) policy of the Jonathan government, and found that we still have gaps in demand and supply of key crops [FMARD Policy & Strategy Document, APP 2016-2020, 9]. But with declining agricultural productivity, due to climate change, the gaps are set to widen even further.

Another indirect effect of climate change is the issue of clashes between herdsman and farmers, which is a serious and prevailing social problem in Nigeria. Due to the problem of rainfall variability, caused by climate change, herdsman in the core North, now push down South more frequently, in order to feed their cattle on farmers' cultivation. This has mutated over time in the destruction of investments and efforts, while also attacking outspoken farmers, a situation for which hundreds of lives have been brutally lost in Benue, Taraba, Nasarawa, Ogun and several other states, a stat corroborated by the National Emergency Management Agency (NEMA).

Decades ago, pastures were arguably available at reasonable level in both the North and South of Nigeria, and these clashes were almost non-existent. Evidence is seen from the changing nature of the nation's ecological zones. Hence, we see serious clashes result, because these nomadic herdsman want to satisfactorily feed their cattle, often at the expense of farmers' cultivation. This issue needs urgent unbiased action in Nigeria now. The support of the international community at this point will be valued, as the Nigerian government has not been able to give satisfactory, non-ethnic and proactive solutions, while lives are wasting away.

There is also an increasing rate of natural disasters and extreme weather events. Northern Nigeria is becoming more of a drought-prone area, with an advancing desert, already encroaching southward, thus making the few cultivable lands of the north, almost uncultivable. Flooding is no small issue in Nigeria, with hundreds of thousands of people, agribusiness and property lost in 2017, in Benue State, Kano, Lagos and other states [according to NEMA]. It is now a robust mechanism for numerous diseases to breed, especially vector-borne diseases like Malaria (WHO puts Nigeria as the nation with the highest Malaria casualties worldwide). And because of drought, children, especially in the North, now stand at risk of malnutrition.

According to United Nations Children's Fund (UNICEF), Nigeria currently has the highest number of malnourished children, who are under the age of five. The erosion of low-lying coastal and non-coastal regions of Nigeria is also disaster, which is also causing buildings to collapse, with attendant loss of lives, while also raising construction cost as its implication. Another very important effect of climate change in Nigeria is the declining soil carrying capacity and heat related problems on humans, crops and livestock. Due to deforestation, trees which should serve as cover for soil against the harsh sunshine, are felled indiscriminately, thereby, exposing soils and reducing soils productive capacity, and thus, creating problems for agriculture in Nigeria. Heat-related incidents are on the rise, as well as heat stress (hyperthermia) on both crops and livestock, because of increasing greenhouse gas emissions, leading to high losses in crop and livestock production. Climate change has cost Nigeria an increasing loss of biodiversity, from which several problems have emerged, such as the destruction of marine ecosystem, loss of nature's balance, as well as destruction of freshwater resources. This situation currently poses problems for man, as he cannot live in isolation, but in interdependence with his environment. Failure to protect the environment is like a death penalty, hence, we must, as a centre of focus, ensure that the protection of the Nigerian ecosystem is not undermined.

### ***Climate Change Mitigation and Adaptation Strategies in Nigeria***

Developed and developing countries alike are working hard to find solutions to the effects of climate change, as the impacts vary in extent and nature. In order to address the resulting impacts, adaption practices should lay emphasis on community interest to encourage sustainable development. It is suggested that adaptation strategies will be more successful if they are identified and presented to local users for vetting to ensure their consistency with local priorities, norms, goals and institutions (Newton, Paci & Ogden, 2005). Community-based adaptation has become an important term in the climate change debate (Uyigwe & Agho, 2007). It recognizes the fact that environmental knowledge and resilience to climate change lay within societies and cultures (IPCC, 2001). Furthermore, an understanding of how communities cope with environmental changes is important when developing community-based adaptation projects to mitigate the effects of climate change for the local farmers and their families. The goal of community-based adaptation is to increase climate change resilience of communities by enhancing their capacity to cope with climate related issues such as less predictable rainfall patterns, frequent droughts, stronger heat wave, invasion of diseases and weather hazards of unprecedented intensity (IPCC, 2001) cited in Onu and Ikehi (2016: 27).

Akpofure (2009:476) argued that mitigating the effects of climate change involves intervention of policies to reduce the emission or enhance the sinks of greenhouse gases. The current international legal mechanism for countries to reduce their emissions is the United Nations Framework Convention on Climate Change (UNFCCC) and the following policy actions are suggested:

**The industrial sector:** The first policy area should focus on the industrial sector which is the main energy and carbon dioxide generator. The reduction of industrial carbon dioxide can be achieved through four options: (i) structural changes affecting material utilization and recycling, (ii) efficiency improvements, (iii) industrial process change and (iv) fuel-mix changes.

**The transportation sector:** The second policy should focus on the transportation sector. Reduction in carbon dioxide emissions in the transportation sector can be achieved through the following options: (i) improving energy efficiency, (ii) good road network, and (iii) behavioural modification

**Renewables:** The third policy is on renewables. Renewable sources of energy are extremely important in the mitigation of greenhouse gases. The following are the policy options: (i) implementation of policies stimulating increased utilization of renewables, (ii) invitation of international organizations to support this policy in developing countries.

**Forestry and Agriculture;** the forth policy is on forestry and agriculture, since they function as sinks for carbon dioxide emission. The necessary policy options to be taken are: (i) implementation of policies to reverse deforestation, (ii) implementation of policies to cover sustainable forest management of existing forest resources and (iii) implementation of soil conservation

**Information:** Another policy area is on information. There is a desperate need for simple guides, easily accessible information to the public on climate problems. The necessary policy options are; (i) involvement of environmental non-governmental organizations to give mass campaign, (ii) implementation of agenda 21 in collaboration with relevant organizations.

In a similar Eke (2017) Mitigation options should be shortlisted and prioritized. Criteria for the prioritization should be established. The criteria should include mitigation potential, cost, technical feasibility and others. The relationship of each mitigation measure to development, job creation, air quality and health should also be considered. Cost-benefit analysis should be used to prioritize mitigation options. Jobs and economic impact models should be designed and used to make informed decisions on mitigation options. For instance, the job creation potentials of adopting renewable energy as a climate change mitigation option should be embraced. Multi-criteria approach may also be embraced to prioritise mitigation options. Barrier analysis for each shortlisted option should also be done. This includes assessing the enabling environment such as domestic policy and institutional barriers for each mitigation option. It also includes understanding the mix of financial and non-financial measures that will be deployed to execute each mitigation option. To effectively mitigate greenhouse gas emission, there is need to design a model of business- as-usual emission scenario and an emission reduction scenario.

### ***Theoretical Analysis***

The theoretical guide for this study is the Human security framework which was first used by Mahbub ul Haq in the United Nations Development Programmes in 1994 Human Development Report. Human security is concerns with the overall interest of putting in the measures of the total security of the individuals in their respective states. That is, it is the total support of the security means of the human in any given society.

For Gregoratti (2018) the concept of human security represents a departure from orthodox security studies, which focus on the security of the state. The subjects of the human security approach are individuals, and its end goal is the protection of people from traditional (i.e., military) and nontraditional threats such as poverty and disease. Moving the security agenda beyond state security does not mean replacing it but rather involves complementing and building on it. Central to this approach is the understanding that human security deprivations can undermine peace and stability within and between states, whereas an overemphasis on state security can be detrimental to human welfare. The state remains a central provider of security, but state security is not a sufficient condition for human welfare.

Lincolnd (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 and Gasper (2014: 2) the human security approach broadens the scope of security analysis and policy from territorial security to the security of people. The 2012 GA 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.<sup>2</sup> Subsequent debate in the 1990s added the freedom 'to live in dignity' cited in Idoniboye-Obu and Sapele (2018: 5).

It is important to note that this framework identified the essentials needs of security the individual towards a better livelihood and a functional society, because securing the people is necessary for even development and a framework to implement the convention and the protocol activities. The human security theory is relevant because it will help in encouraging the state to focus purely on the people towards a better society and in tackling the impact of climate change in Nigeria. More so, this approach will exposes the endemic dangers associated to greenhouse emissions and how the people are suffering from the neglect of the adherence to enabling laws associated to institutional frameworks and strategies for climate change mitigation in Nigeria.

### ***Findings and Conclusions***

The study revealed that Nigeria with a known vast land space of 923,768 Sq km spanning across diverse climatic areas is considered to be highly vulnerable to climate change. The study finds that Nigeria position in supporting adaptation and mitigation measures towards climate change is yet to be fully realized. It also revealed that the Nigeria policy framework for aligning human development and climate change management still stands undeveloped, Nigeria also contributes minimally to greenhouse gases (GHG) emissions. The research discovered that the issue of climate change to a large extent has impacted negatively on the global environment and in relation to Nigeria due to the factors of natural and man-made which have become a major concern to the Nigerian government. Climate change has declined the pattern of agricultural productivity which is as a result of the irregular, unpredictable farming calendar these supported the argument of Aina (2012) and Onu and Ikehi (2016), of Olufemi (2018) respectively.

In conclusion, evidences have shown that climate change impacts on Nigeria arise from various climate change-related causes such as increase in temperature, rainfall, sea level rise, impact on fresh water resources, extreme weather events, flooding, drought in the north and increased health risk. Nigeria is experiencing adverse climate conditions with negative impacts on the welfare of millions of people. Persistent droughts and flooding, off season rains and dry spells have sent growing seasons out of orbit, in a country dependent on rain-fed agriculture. Alarm bells are ringing with lakes drying up and a reduction in river flow in the arid and semi-arid regions. The result is fewer water supplies for use in agriculture, hydro power generation and for other uses. The main suspect for all this havoc is Climate Change.



***Recommendations***

Based on this study, the research recommends the following ways in tackling the impact of climate change in Nigeria and also government approaches and strategies in its mitigation which includes: Government should employ all means of the reduction of emission of greenhouse gases as regards to the control of deforestation, high measures of weather control system; Government should have the political will to create awareness on the effects of climate change in Nigeria through a collective means to the entire country of the consequence of climate change and the strategies on its mitigation in Nigeria; Government should take drastic measures to establish and implement new policy framework that would comprehensively tackle the issues of climate change in Nigeria; There should be all round funding scheme for research on climate change in Nigeria and this will help to promote effective scholarship in the country; Government should encourage universities in Nigeria to establish centers, special units to handle research, courses, programmes on climate change mitigation; Government should endeavour to gather enough data and statistics which would greatly help to enhance the effective and efficient monitoring and evaluation mechanism across the country.

## References

- Adeyeye, P. (2012). Climate Change AND Food Security in Nigeria: A Behemoth Impending Development. Retrieved from 22/07/2018 le: //c:lusers/hp/Downloads.
- Agbo, C.U. (2012). Climate change and crop production in Nigeria: Effects and adaptation options. In A. A. Enete & M.I. Uguru (Eds.). *Critical issues in agricultural adaptation to climate change in Nigeria*. pp. 114-143. Enugu: Chenglo.
- Akpofure, R. (2009). Environmental Science. An Introduction. Kraft Books Limited, I b a d a n , O y o State Nigeria.
- Aina, P.O (2012). Climate Change and Food Security: The Challenge of Transforming Agriculture in Nigeria. Lecture Delivered at Ikorodu Division Resource Development Group (IDRG).
- Chidi, C. (2017). The Threat to Climate Change in Nigeria. Paper presented at the Bayelsa Agricultural Focus Group.
- During, R (2018). Impact of Climate Change on Health in Nigeria. *This Day*, 3<sup>rd</sup> October.
- El-Ladan, I.Y. (2014). Climate Change and Food Security in Nigeria .A paper presented at the Scientific Session of the International Conference on Possible Impacts of Climate Change on Africa, Organized by the Institute of African Research and Studies, Cairo University, Cairo, Egypt. 18<sup>TH</sup> -20<sup>TH</sup> ,2014.
- Eke, M. (2016). "Agricultural Policies and Climate Change". *The Guardian*, December, 19th.
- Eke, M. (2017). On the Mitigation of Climate Change. *The Guardian*, March, 12rd.
- Ekpo, I.J. (2014). Slow Response to Climate Change in Nigeria: Need for Urgent and *Comprehensive Action: Studies in Social Sciences and Humanities*. 1 (1).p.19-29. Gregoratti, C. (2018). Human Security. Retrieved 6/02/2019 <https://www.britannica.com/topic/human-Security>. in Nigeria.
- Idoniboye-Obu, S.A and Sapele, F.F (2018). Impact of Climate Change on Food Security *NDU Journal of Social Sciences, Bayelsa State* (12)1 .
- Idumah, F.O, Mangodo, C, Ighodaro, U.B and Owombo, P.T (2016). Climate Change and Food Production in Nigeria: Implication for Food Security in Nigeria. *Journal of Agricultural Science*. 8(2) Canadian Centre of Science and Education.
- Inter-governmental Panel on Climate Change, (2007). Synthesis Report. Fourth Assessment Report : Climate Change 2007.
- Ogbonna, A. (2018). How food Security is being threaten in Nigeria. *Vanguard*, April, 6<sup>th</sup> 2018.
- Olufemi, M. (2018). Climate Change and its Effects on Present-Day Nigeria. *The Tribune*, February, 2<sup>rd</sup>.
- Onu, F.M and Ikehi, M.E (2016). Mitigation and Adaptation Strategies to the Effects of Climate Change on the Environment and Agriculture in Nigeria. *IOSR Journal of Agriculture and Veterinary Sciences*
- Osuafo, A.M and Mnorom, N.R (2014). *An international Journal of Science and Technology*. Bahior Dar, Ethiopia. 3 (1) National Environmental, Economic and developments Study (NEEDs). For climate Change in Nigeria (Final Draft) September. "Nigeria Emissions Reduction Policy" (2016). [climatescorecard.org/2016/11/Nigeria-emission-reducepolicy](http://climatescorecard.org/2016/11/Nigeria-emission-reducepolicy).
- Saibakumor, W. (2014). Climate and it Impact in Nigeria. Unpublished material. College of Education, Warri.
- Terso, I.J. K and Ogochukwu, I.J (2014). The Implication of Climate Change on Food Security in Nigeria. *Journal of Good Governance Sustainable Development in Africa (JGGSD)* 2(3), p.33-41.