DOI: https://doi.org/10.68064/jshe.2020.fddgw2nl

Climate Change: A Threat to Food Security in Nigeria

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Abstract

This paper reviewed how natural and anthropogenic sources of climate change interfere with the pillars of food security in Nigeria. All the pillars of food security were found to be affected by factors of climate change. Increased atmospheric temperature was reported to decrease farming activities due to the impact of heat waves on the farming families. Young farmers resort to withdrawing from farms as a coping strategy but sometimes regroup to engage in dubious meetings leading to youth restiveness and insurgency. Thus, youths' restiveness and insurgency in Nigeria has remote link to global warming. These has resulted in destruction of farmlands, contamination of fishing waters, displacement of farming families, reduction of farming activities, abandonment of families leading to decreased food supply, increased food shortage, soaring food prices, disruption of food marketing distribution system, reduction in food processing and utilization activities. Family displacement also led to poor meal planning and nutrient deficit which can trigger malnutrition, intensified hunger, reduces purchasing power and food security. Other emerging concerns of food security connected to climate change include flooding of farmlands and environs increased fire outbreak, increased migration of Fulani herdsmen and their cattle from North to Southern Nigeria. All these results in destruction of farmlands, displacement and killing of farming families while creating food insecurity, Reforestation, introduction of peace, close monitoring of climate change, creation of grazing fields and adoption of ranches are some of the recommendations made.

Keywords: Climate change, anthropogenic source, Environmental acidification, Deforestation, Food security.

Introduction

Climate change is the alteration of the regular pattern of weather conditions of a particular place for an extended period of time due to global warming. According to Olaniyan, (2016), global warming is the rise in average earth's surface temperatures over time leading to certain consequences. Global warming has been responsible for climate change and the rise in sea-level with challenging consequences leading to bad weather, flooding, hurricane, wildfire, poverty, melting glaciers, ocean and sea level rise, droughts, typhoons, ill-health, destruction of farm lands, food shortages and other socio-economic challenges (Gbadebo, Babayeju and Uko-Aviomoh, 2012).

Iwu (2017), revealed that climate change can occur from two main sources, natural and human sources. Changes of size, topography and mutual location of the oceans and continents, earth's orbit and axis perimeter's change, atmospheric transmission coefficient change, greenhouse concentration in the atmosphere such as carbon dioxide, methane and nitrous oxide, the earth's surface reflectance change (albedo) and changes of the heat available in the deep ocean are the natural causes or sources of climate change. Iwu (2017) further identified the human sources to include anthropogenic climate alteration and its consequences, the breach of the natural state of the ozone layer,

environmental acidification including acid deposition and local air pollution.

The electromagnetic wavelength from the sun is absorbed by the earth and radiated out as heat. Some of these infrared energy (heat) is absorbed by the "greenhouse gases" while some are radiated back to the earth as heat energy. The greenhouse effect helps to warm the earth and make it hospitable. Greenhouse gases include water vapour (H_2O), Carbon dioxide (CO_2), Methane (CH_4) and nitrous oxide (N_2O). These gases are produced as part of the natural system such as respiration and combustion. The greenhouse gases trap heat but allows sunlight to pass through (Rye, Strong and Rubba, 2000). Human activities such as deforestation, industrialization and developed technologies for example, manufacture of vehicles has increased greenhouse gases especially CO_2 by 30% in the past 300 years (Taylor, 1999). This increase in CO_2 comes mainly from burning of fossils (Coal, Oil and natural gases), bush burning and burning of waste (cellophanes).

Ozone (O_3) in the stratosphere (upper atmosphere) is known as the "Ozone Layer". The Ozone layer absorbs most of the ultraviolet rays (UV). It protects the earth from the UV rays, too much exposure to UV radiation is known to cause skin cancer, cataracts and depression of the immune system and could also lower the productivity of some crops. Ozone in the stratosphere is known as "good Ozone". Smog which comprises of chlorine, fluorine and carbon (CFC) can destroy the stratosphere's Ozone and cause hole in the atmosphere. Based on this, the manufacture of CFC was banned in an international treaty (the Montreal protocol). Unfortunately, CFC has a lifespan of 50 years so those manufactured in the 1970's is still damaging the Ozone layer till today (Scientist statement, 1999). Depletion of the Ozone layer removes the protective covering and therefore, makes the ultraviolet rays of the sun to heat the earth's surface directly thereby increasing the earth's temperature which leads to global warming resulting in climate change over time. Most countries of the world, including Nigeria are involved in activities that generate greenhouse gases thereby getting exposed to heat waves and its consequences.

Nigeria like other countries of the world and Africa in particular is experiencing climate change. The factors of climate change affecting Nigeria are more of man-made factors. Iwu (2017) reported that anthropogenic factors are the main causes of climate change in Nigeria. These anthropogenic factors are connected to reckless human activities which include: Bush burning, improper waste disposal (burning of polythene bags, plastic containers), cutting down of forest, gas flaring, use of fairly used (second hand) equipment like refrigerators, cars, trucks, generators, television sets, gas cookers and microwave ovens, (Uko-Aviomoh and Oso, 2008). This paper will address the anthropogenic as well as natural sources of climate change as it impacts on food security in Nigeria, look at it from the threats it impacts on food security.

Sources of Climate Change in Nigeria

It has been established that anthropogenic factors are the main causes of climate change in Nigeria. These anthropogenic factors are connected to reckless human activities. These will be examined to determine how they affect factors of climate change and pillars of food security.

Bush Burning and Tree Felling

Bush burning is a common practice during land preparation in Nigeria. Burning of household wastes especially polythene packaging materials, plastic containers and gas flaring increases the release of greenhouse gases especially CO_2 into the atmosphere thereby depleting the Ozone layer and increasing atmospheric temperature. Cutting down of forest, use of fairly used (second hand) items such as second hand cars, generators, refrigerators, gas cookers, freezers, microwave, ovens, television sets all promote emission of CO_2 into the atmosphere thereby promoting increase in temperature and subsequently global warming which over time leads to climate change.

Bush burning and tree felling in Nigeria is used to manage the land. This is done

during hunting and felling of trees used or sold as firewood for fuel. Climate experts and agriculturists have remarked that these human activities have contributed to global warming and also deprived the soil the key nutrients (Bashir, 2010). If the soil is deficient in nutrients, it implies that food crops arising there from will also have nutrient deficit, thereby affecting a pillar of household food security (food utilization). Bush burning increase greenhouse gas concentration especially carbon dioxide (CO_2) which in turn destroys the ozone layer, leading to increase earth's temperature, decreased precipitation, increased incidence of bush fire and further increase in greenhouse gas emissions and its corresponding consequences.

In addition, bush fire is common in Nigeria especially during the dry season (November - March). With the growing impact of global warming, the dry season is extremely dry in all parts of Nigeria. The heat waves coupled with the dry harmattan wind makes the weather so dry that the moisture content of fresh plants become low that even green leaves and plants burn vigorously during any fire outbreak. The fire most times spread too rapidly in an uncontrollable manner, destroying large acres of land resulting in loss of food crops, wildlife, forest plantations and desert encroachment. Bush fire result in loss of food crops, farmlands, wild - life, forest plantation and desert encroachment.

Loss of food crops, wildlife, forest plantation and desert encroachment destroy food availability, food stability, food accessibility and food utilization which are pillars of food security. Wildfires are usually a threat to the savannah region with low rainfall, low relative humidity and high temperatures. (International forest fire News, 2007). The fire database is not fully developed in Nigeria (Adedoyin and Olarenwaju, 2006), however, drought and desert encroachment increase the incidence of Bush fire. It is estimated that 53% of the Savannah is prone to annual bush fire. According to Oguntala (2015), losses to bush fire was estimated at $30 million in 1982/ 1983. This is a huge economic and agricultural loss which affects all the pillars of food security.

Desert Encroachment

Nigeria is one of the nations with great risk of desert encroachment. Eleven (11) Northern states are at the frontlines including Kebbi, Zamfara, Gombe, Yobe, Adamawa and Bauchi. Nigeria loses at least 35,000 hectares of its arable land annually to desert encroachment in the North.

Desert encroachment is reported to be moving southwards at a rate of 0.6 kilometres per year (Armstrong – Ogbonna and Onoh, 2015). Desert encroachment results in land deterioration, turning productive lands barren and unfit for human habitation. This threatens all the pillars of food security, economic and social stability. Loss of farmlands is followed by migration of peasant farmers to cities in search of sustainable livelihoods. Movement of peasant farmers to cities creates more people to feed with reduced farm productivity which further threatens all the pillars of food security.

Gas Flaring

Gas flaring has been practiced in Nigeria for several decades. Oil gas flaring is another major contribution to global warming. In Nigeria, about 75% of gases emitted is flared because there is limited technical facilities to make use of it, however during the Koyoto Protocol, World Bank (2007) stated that, Nigeria was listed among the 15 other oil processing countries that have progressively reduced gas flaring. Gas flaring promotes continuous emission of greenhouse gases into the atmosphere, thus, destroys farmland, food supply and all the pillars of food security, (Olaniyan, 2016).

Improper Waste Disposal

Waste disposal in some Nigerian cities is still a problem. Owing to inefficient evacuation of wastes by appropriate bodies, some citizens burn the waste or use burying method. Plastics, polythene bags, waste papers and other environmental unfriendly materials also are burnt regularly resulting in emission of greenhouse gases into the

atmosphere. This increases destruction of the ozone layer resulting in increased atmosphere temperature and its corresponding effects resulting to global warming and food security consequences.

Use of Fairly Used Equipment

The economic recession in Nigeria has resulted in very high inflationary rate (over 200%), reduced purchasing power and poverty, (World Bank,2007). Many citizens, therefore, acquire fairly used (second hand) items such as cars, freezers, refrigerators, gas cookers, electric cooker, electric iron, generators and microwave ovens. These items have been used, reused and therefore, are not efficient during combustion. Greenhouse gases are emitted into the atmosphere daily from these sources. It becomes very worrisome to note that 90% of Nigerians own different sizes of generators in the homes, offices, business premises and commercial and religious houses. Nigeria has no steady supply of electric power and adequate source of renewable energy; these contribute large amounts of greenhouse gases to the atmosphere on a daily basis. These gases have a great role to play in the destruction of the ozone layer, global warming and its consequences on the pillar of food security.

Influence of Increased Earth's Temperature and Intensity and Distribution of Precipitation on Food Security in Nigeria

All human activities responsible for global warming, climate change and its' consequences result in increased earth's temperature and alteration in precipitation. It is, therefore, important to look at these climate change factors closely and link this to pillars of food security. The increase in temperature is very drastic overtime resulting in heat waves, more demand for portable drinking water and no clear demarcation of rainy season from dry season. According to Bashir (2010), the dry season is very dry, and the rainy season is extremely cold. The number of rainy days and duration of precipitation is gradually decreasing resulting in reduction of growing season for planting of crops. Selective planting is carried out to ensure the survival of food crops that can withstand climate change. This has serious effects on all the pillars of food security.

Flooding

Flooding is caused by very heavy rains and flooding can be promoted by improper drainage system and blocked drainages due to careless human activities. Flooding is one of the environmental crisis Nigeria has challenged the environment. Flooding leads to damaged farmlands, destruction of access roads, loss of lives and properties, destruction of portable water, destruction of aquatic and terrestrial animals, destruction of livelihood activities such as farming, fishing, animal breeding and trading. It has also led to emergence of relief centres and internally displaced persons camps (Obuh, Uko-Aviomoh and Ohanaka, 2016, Nigeria, flood, 2013). The worst flood ever recorded in Nigeria occurred in 2012 when Cameroon released water from the Lodja dam. Thirty (30) out of 36 states of Nigeria were affected during this period. It caused damages estimated at N2.6 trillion, affecting 7 million people and generating internally displaced people's camps (Twari-Futayin, Paul and Godleads, 2015), floods and droughts result in food gaps and household food insecurity (Uko-Aviomoh, Eko, Akano and Oladoyinbo, 2013).

Youth's restiveness in Nigeria

High temperatures result in heat waves which has negative effect on human and animals. Increased atmospheric heat is known to decrease farming activities due to the impact of heat waves on the farming families. Young farmers resort to withdrawing from the farms as coping strategies but sometimes regroup to engage in dubious meetings leading to youths' restiveness and insurgency. Thus, youths' restiveness and insurgency in Nigeria can be remotely linked to global warming.

Climate change has contributed to emergence of several militant groups that are now common in the various regions in Nigeria, (Mayah, 2016). Although there may be some political and religious motive behind the formation and execution of the activities of these insurgency groups, extreme climatic conditions caused by

climate change is also a major reason for their activities.

Movement of Fulani Herdsmen

Fulani herdsmen are cattle herders based in Northern part of Nigeria. Fulani herdsmen migrate from the Northern part of Nigeria (during the dry season) to the South in search of green pastures for the cattle. The frequency of these movement has increased drastically because of the increased waves from climate change. The herdsmen have added a new dimension to their movement. Kidnapping, abduction, killing and rape is now associated with some criminal herdsmen in the guise of cattle rearing (Uko-Aviomoh, Eko, Akano and Oladoyinbo, 2013, Davidson and Zibiri,2019). In addition, these people unleash the herds on the farming communities while, destroying the crops, (Hameed, 2014, Adiagwai, 2017, Onah and Olajide,2020). Some of the states affected are, Benue, Delta, Edo, Enugu, Abia, Oyo and Nasarawa. Most farmers in the affected states have abandoned their farmlands resulting in reduction of crop yield, food supply, soaring food prices thereby affecting all the pillars of food security.

Food security is the ability of people to have physical and economic access to sufficient, safe and nutritious food that meet the dietary needs at all times and the food preferences for an active healthy life (FAO 2006, Uko-Aviomoh and Salami, 2011). Land ownership and use, soil management, crop and livestock selection, breeding and management including harvesting of crops all affect food security. Exchange of food requires efficient trading system and market institutions. It also requires efficient food storage, processing and transportation system, these are lacking in Nigeria (World Summit on Food Security, 2009, Uko-Aviomoh, 2017). Food Utilization is the biological absorption of food that requires a combination of energy and essential nutrients. It also requires creativity in terms of recipe development, meal planning and wise choice of foods (Obuh, Uko-Aviomoh and Ohanaka 2016, Uko-Aviomoh, 2017). Seasonal availability of food coupled with poor food processing, storage and underdevelopment of food industries in Nigeria has promoted food instability. Foods are not available all year round. Nigeria is currently undergoing economic recession and the citizens are facing food insecurity

Conclusion and Recommendations

Climate change was found to affect all the pillars of food security at different levels. Human activities were found to promote climate change in Nigeria. Climate change was found to promote insurgency, migration and also affect livelihood activities thereby leading to decreased food supply reduction of farming activities, farming families 'displacement, destruction of farmlands, destruction of food marketing/distribution system, reduction in food processing and utilization activities. Farming families' displacement was found to lead to poor meal planning and nutrient deficit which can trigger malnutrition, intensified hunger, hidden hunger reduced purchasing power and food security. Thus, identifying the natural and anthropogenic sources that threaten food security is halfway into creating a solution to food insecurity in Nigeria.

Based on this review the following recommendations are made:

1. Government must reduce the burning of fossil fuel thereby reducing the emission of greenhouse gases. This can be achieved if government, non-governmental agencies, individuals and other stake holders practice tree planting to increase the oxygen content in the atmosphere.
2. Renewable energy sources need to be generated to protect the environment and humanity habiting the space.
3. Provision of grazing fields, adoption of ranches for cattle herders and peace education at all levels of education should be a pivotal goal in Nigeria.
4. Waste disposal systems should be efficient to prevent households from using the crude method of waste burning or dumping the waste in drainages or by the road side.
5. Use of second hand or fairly used

equipment should be abolished and citizens should be empowered economically to afford the purchase of new equipment.

6. Continuous sensitization and close monitoring on the dangers of climate change should be pursued by relevant agencies such as NIMET.

References

Adagwai, F. (2017). Activities of Fulani Herdsmen versus food Security in Nigeria. Nigeria *Journal of Education, Health and Technology research, 9,* 50 - 58

Adedoyin, B. A. & Olarenwaju, A. V. (2006). fire situation in Nigeria. Disaster Monitoring Constellation (DMC) www.disastermornitoringconstellation retrieved: 20/07/2017

Armstrong-Ogbonna, A. & Onoh, I. (2015). Encroaching Desert fuels conflict in Nigeria. https://climate.earthjournalism.net.encroachment.desert retrieved 21/07/2017

Bashir, M. (2010). Fire in Nigeria: the impact of Bush fire and Tree felling. Daily Trust.allafrica.com retrieved 20/07/2017

Davidson, E & Zibiri, S. (2019). The Menace of Fulani Herdsmen attack and its effect on the economic Development of Nigeria. https://papers.ssm.com/2013 retrieved 28/01/2021

Gbadebo, CIT. Babayeju, A. A. & Uko-Aviomoh, E. E. (2012). Global warming, Causes, effects and control/measures. *Nigeria Journal of Education, Health and Technology Research 3* (2), 19 – 30

Hameed, B, (2014). Fulani Herdsmen and Threat to food Security. http://www.nigeriaobservernews.com/16032014/16032014/features4.html#vafpvqdjvom.retrieved 20/07/2017

International Forest Fire News (2006). Fire Situation in Nigeria 34,89-93. www.fire.uni-freeburg.de>ffn retrived 18/07/2017

Iwu, N. (2017). Climate change in Nigeria. Naijanews.com retrieved 20/07/2017

Mayah, E. (2016). 18 new Armed groups spring up in Nigeria. Premium Times. www.premiumtimes.com/news/topnews

Nigeria floods (2013). Floods in Nigeria. Wikipedia https://en.m.wikipedia.org.wiki. retrieved21/07/207

Obuh, J. I., Uko-Aviomoh, E. E. & Ohanaka, J. (2016). Boko Haram: A threat to food security in Nigeria. *Nigeria Journal of education, Health and Technology Research 8,* 237 – 247

Oguntala, A. B, (2006). The Climate aspect of 1982/1983 wildfires in Nigeria. World Agro forest centre. www.worldagroforestry.org retrieved 21/07/2017

Olaniyan,O. (2016). Global warming and its effects in Nigeria. thenationonlineng.net/global.warming retrieved 20/07/2017

Onah, I. & Olajide, B.E. (2020) Applying restorative Justice in resolving the farmers-herdsmen conflict in Nigeria. Retrieved from www.acord.org.za,AJCRS. Retrieved 28/01/2021.

Rye, J. A, Strong, D. D. & Rubba, P. A. (2000). Global warming and ozone layer. www.socialstudies.org./../650202html

Scientists' statement on Global climate disruption (1997). Washington DC, Ozone action, 1997. www.ozone.org/stateii.html

Taylor, K. (1999). Rapid climate change. *American Scientists,* 87, 320-327

Twari-Fufeyin, P., Paul, M & Godleads, O. (2015). Some aspects of a historic flooding in Nigeria and its effects on some Niger-Delta communities. *American Journal of water resource, 3* (1), 7-16

Uko-Aviomoh, E. E. (2017). Vocational/Technical Education, Economic recession and food security in Nigeria: the need for leadership training, lead paper presented at the Second Annual Conference of School of Vocational Studies, College of Education, Agbor, Delta State

Uko-Aviomoh, E. E. & Oso, O. O, (2008) Reducing the Health effects of Global warming: What Households can do. *Journal of Home Economics Research 9,* 80 – 90

Uko-Aviomoh, E. E. & Salami L. T. (2011). Food security and food diversity in Nigeria. *Nigeria Journal of Home Economics Research 2,* (1) 132 – 140

Uko-Aviomoh, E. E. Eko, M. E. Akano, R. A & Odadoyibo, C. A., (2013). Energy issues and risk management strategies for food security in Nigeria. *Journal of Applied Education and Vocational Research* 11, (1), 49-63