

# Implications Of Drought-Related Climate Change On Food Security In Lake Chad Basin

**Nwankwo, Donna-Carine Nkeiruka**

PhD - Research Scholar, Department of Political and Administrative Studies, University of Port Harcourt, Nigeria

**Dr Ukiwo, Okoroafor Ukoha**

Lecturer, Department of Political and Administrative Studies, University of Port Harcourt, Nigeria

*Abstract: Climate change as a global phenomenon has reduced the volume of water in the Lake Chad from 400,000 km<sup>2</sup> to about 2,500 km<sup>2</sup>. It is evidenced by the receding Lake Chad and dryness of the previous wetlands in Lake Chad Basin with dunes around the surroundings of the Lake. Social vulnerability theory was adopted in explaining climate change which is caused as both natural and human-made factors. Primary data generated for the study, descriptive and historical research design used in the study. The study found that both natural factors and human-made factors are responsible for climatic change which is causing more global warming with negative consequences on the entire region. However, the research established that the impact of drought-related climate change in the Lake Chad Basin has grossly affected the food security of the Basin populations. The resultant effect is on the livelihood of the people whose source of income deeply depends on the resources of the Basin. The implication of the findings of the study is for the Lake Chad Basin Commission to facilitate coordination of policy responses of member states towards mitigating the impact of climate on food security. The litmus test for coordination will be ongoing efforts to recharge the Lake Chad for sustainable livelihood of the population in the Lake Chad Basin.*

**Keywords: Drought, Climate Change, Food Security and Lake Chad Basin.**

## I. INTRODUCTION

Climate change has been a global challenge to food security in diverse ways. In 1997, the Kyoto Protocol became the first international agreement taken to curtail factors that contribute to climate change. Wishat (2009) revealed that human activities especially those that lead to burning of fossil fuels have unleashed waste gases and methane into the atmosphere massively resulting in the overwhelming warming up of the planet. The most severe impact of climate change is on food insecurity due to environmental degradation of natural resources. Many African countries are suffering from El Niño associated with climate change. An example of such incidence is the Ethiopian drought and the current drought in Lake Chad Basin. Climate change has interfered with most farming seasons and led to drop in the pastoral activities, fishing and generally all aspects of food production with significant danger to Lake Chad Basin population. Food and Agriculture

Organisation (FAO) of the United Nations in 2016 stated climate change has a severe effect on agriculture which undermines the livelihoods of millions of individuals. Also, climate change contributes to increased risk of food malnutrition, vulnerability to disease and food dependency. In order to curtail the global impacts of climate change, a series of international conferences have been held. These are the 2015 Paris Conference that took place in France, the 2016 Climate Change Conference in Marrakech, Morocco, and the 2017 conference presided by the Fiji Government in Bonn, Germany among others. These conferences were geared towards global reduction of causes of climate change and implementations of agreed policies nation-wide.

Africa region, with its arid and semi-arid climatic zones, is vulnerable to diverse forms of climate change as shown in rising temperature, erratic rainfall, desertification, and drought among environmental degradations. Climate change impact has made the Lake Chad recede over time. This was evidenced

in 1973 comparative studies of the size of the Lake reducing from its previous size in the 1960s. The impact has reduced the 'Mega Lake Chad' from a surface area of about 400,000 km<sup>2</sup> to about 2,500 km<sup>2</sup> (LCBC Report, 2016; Gadzama, 1991). The impact on food security have manifested in shrinking of Lake Chad due to global climate change positioning the region as a global reference to climate change and an environmental problem to Lake Chad Basin countries. Initially, Lake Chad Basin was a region known for intensive agricultural activities, a source of employment and centre for international trade and economic relations of the member countries. The impact of climate change has affected the smooth food production of the Basin countries.

The reduction is resulting from non-implementation of the Lake Chad Basin Commission policies on the management and sustainability of the resources in the region. The Lake Chad Basin Commission is a regional body formed in 1964 initially comprising the riparian countries of Lake Chad Basin. The commission later extended its mandate to other Basin countries, which is charged with the responsibility of protecting the Lake Chad and its natural resources as well as the integration of the member states. However, the policies of the Lake Chad Basin Commission have been undermined by its member-nations as they strive to survive the drastic reduction of Lake Chad water to achieve food security in the region. The Basin witnessed population explosion, migration, difficult economic situation, hunger, poverty and they posed eligible persons to terrorism. The Lake Chad Basin Commission Report in 2016 captures that the resources in the Basin are essential for the economic well-being of the people and to ensure food security. The basin population in order to survive, follow the shrinking Lake Chad without knowing that they are in the shores of another country. The situation is resulting in various vices and conflicts within states and other neighbouring countries.

However, to remedy the situation in the region, the International Conference on Lake Chad was held in 2018 to address climate-related issues and to revitalize the ecosystem for a sustainable livelihood, security and the development of the entire region with a replica effect in the entire African continent.

## II. STUDY AREA

### A. BRIEF INTRODUCTION OF LAKE CHAD

The Lake was formally known as 'Mega Lake Chad' with the massive freshwater body. Lake Chad situates in the Sahel region in Africa, and its wetlands take the second position as the largest area in the region (LCBC, 2016). There was an enormous natural resource within Lake Chad Basin that are so important for agricultural, livelihood and economic development of the people. The total surface area of Lake Chad is referred to as the Conventional Basin including Chad, Niger, Nigeria and Cameroon, Libya, Central African Republic, while Egypt and Sudan are observer member states. The position of Lake Chad is at the connection of four countries known as the riparian states is located in West and Central Africa due to their direct contacts with the Lake. They

are Chad, Niger, Nigeria and Cameroon. As a transboundary Lake, Chad Basin Development Authority in 2012 revealed that it was divided into Southern and Northern poles in 1773. The figure below shows the position of Lake Chad within the Basin:



Source: Chad Basin plan from <https://www.google.com/search?q=lake+chad+basin>

Figure 1: Map of the Lake Chad Basin Commission countries and an Observer Country

Member Country	Population	Total Area (km <sup>2</sup> )	Area (km <sup>2</sup> ) Within the Basin	Climate Type (north to south)	Rainfall in Average (mm per year)	Area Cultivated (% of the total territory in ha)
Chad	13,605,625	1,284,000	1,109,201	Desert and tropical	322	4,932,000
Cameroon	23,393,129	475,650	46,049	Tropical and equatorial	1,604	7,750,000
Niger	19,268,380	1,267,000	671,868	Desert	151	16,000,000
Central African Republic	4,803,082	623,000	217,340	Tropical and equatorial	1,343	1,880,000
Libya	6,317,080	1,759,540	1,548	Mediterranean and desert	56	2,055,000
Nigeria	183,523,432	923,768	180,364	Desert and tropical	1-150	41,700,000

Source: Compiled by Authors from LCBC Report (2016)

Table 1: Facts and Data of the Lake Chad Basin Commission Countries

## III. THE CONCEPT OF CLIMATE CHANGE

Climate change is a phenomenon attributed to natural and human causes. The Intergovernmental Panel on Climate Change (2001) defined climate change as a state a change can be noticed due to changes in the mean and/or the variability of the properties of mean which could be established through the procedure of statistical tests. Meanwhile, the changing process continues for a long time for a decade or more. However, climate change can take place as a consequence of social activities or natural variability in the environment. United Nations Framework Convention on Climate Change (2011) emphasised that climate change is subjected to direct and indirect human activities, altering the original atmospheric composition over a reasonable period globally. Human activities and natural factors affect the atmospheric conditions that disrupt the natural states of the climate.

#### IV. IMPACTS OF CLIMATE CHANGE IN LAKE CHAD BASIN

In the early 1960s, Lake Chad and the surroundings are sources of livelihood to the teeming population. Lake Chad was covered with a massive quantity of water and its wetlands engaged in various agricultural activities by the Basin population and surrounding counties. In 2016, the Lake Chad Basin Commission Report revealed that there were two remarkable stages of the Lake Chad: first stage covering about 20,000 and 25,000 km<sup>2</sup>, and the second stage covering an area of about 15,000 and 19,000 km<sup>2</sup>. However, those natural and massive anthropogenic factors have severely affected natural resources in Lake Chad Basin. These impacts were evidenced in a series of drought in 1973, 1982 and 2008 as captured in the evolution of the Lake Chad (Lake Chad Basin Commission Report, 2016).

#### V. CLIMATE CHANGE AND FOOD SECURITY IN LAKE CHAD BASIN

Impact of climate change in the Lake Chad Basin destroyed the natural resources in the region massively. The continuous rise in temperature in the arid and semi-arid zone of the Sahel region with extreme rainfall has worsened the situation in ensuring food security. The subsequent droughts in the area affected the livelihood of the population. They prompted massive migration of the population from the Northern Pole of the Lake where there are scarce resources to the Southern Pole where they struggle for the menial available resources. The herders in order to feed their cattle migrate towards Lake Chad. They also migrate to the cities in the various countries for economic gains and survival of their livestock.



Source: Field Work.

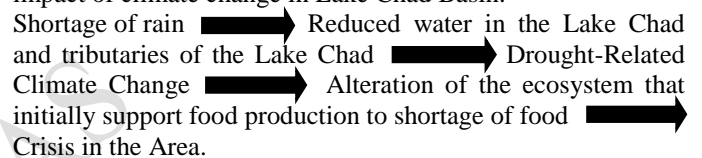
Figure 2: Impact of Drought on Food Production in Lake Chad Basin

Generally, the authors observed a colossal environmental degradation in the area. Also, the fishers, farmers, herders and foresters complained bitterly about the climate impact on the resources of the Basin. However, climate change has

immensely contributed to reduction in the quantity and quality of food production and generally affecting all aspects of food security in Lake Chad Basin.

#### VI. THEORETICAL FRAMEWORK

‘Social Vulnerability Theory’ was applied in analysing the research. The theory emerged in the 1970s by O’Keefe, Wisner and Westgate (O’Keefe, Wisner and Westgate, 1976) while discoursing disaster and natural hazards in the environment with issues arising from such challenges. The proponents stated that taking the naturalness from natural disaster maintained that socio-economic situations are responsible for natural disasters. The theory focused on the relationship of people with their environment. Also, the degree of possible global harm people may experience for being exposed to threats and disasters associated with climate change. However, that people are unable to withstand a hostile environment, they see themselves. Also, it explains the vulnerability of the population of Lake Chad Basin facing the impact of climate change in attaining food security in the region. The figure below can be used to further buttress the impact of climate change in Lake Chad Basin:



Moreover, the resultant effect of climate change in the environment may cause more disaster as people struggle over available natural resources in the region.

#### VII. RESEARCH DESIGN AND METHODS

The research was carried out in Lake Chad Basin using descriptive and historical methods in explaining the impact of drought-related climate change on food security in the study area. The opinion of some people that engaged in agricultural activities in Lake Chad Basin was gathered. Also, through observation of the current environmental condition of the Basin concerning food production. The authors also gathered data during the International Conference on Lake Chad in 2018 in Abuja, Nigeria. Secondary data sourced from internet, library, and documentaries on Lake Chad Basin.

#### VIII. RESULTS AND DISCUSSION

This section presents results on the implication of climate change on food security of Lake Chad Basin countries. The research revealed a significant impact of climate change in the Basin countries with implication on food security of those countries. The result showed that the drastic shrinking of the Lake Chad is as a result of high temperature an attribute of global warming. The reduction in the Lake water couple with drought areas and dunes have reduced agricultural land compared to previous years before the severe drought of 1973. It also showed that climatic change in the region is responsible

for low food production and various crisis such as migration, banditry, the proliferation of arms, poverty, and terrorism among, others in the region.

#### IX. CONCLUSIONS

The findings of the research revealed significant weather change resulting in shrinking of the Lake Chad and dryness of the surrounding environment of the Lake. It showed that natural and socio-economic activities contribute to climate change with a negative impact on food security in Lake Chad Basin. The impact of climate change is evidenced with the receded Lake Chad, drought-ridden swamps of the Lake Chad Basin and dunes harmful to food security. The implication of drought-climate change has a grossly negative impact on the livelihood of the population in the Basin.

#### X. RECOMMENDATIONS

There is a need for serious action by the Lake Chad Basin Commission to coordinate efforts of member countries to implement policies to mitigate the impact of climate change for sustainable food security in the region. Lake Chad Basin member countries, the Lake Chad Basin Commission, Food and Agriculture Organisation of United Nations and other donor agencies in the region to concerned in resuscitating and the development of the area to achieve viable food security.

#### REFERENCES

- [1] Food and Agriculture Organization of the United Nations (2016). The State of Food and Agriculture: Climate Change, Agriculture and Food Security. Food and Agriculture Organization of the United Nations. Rome, 2016. ISBN 978-5-109374-0. FAO and Kiroka, United Republic of Tanzania.
- [2] Food and Agriculture Organization of the United Nations (2016). The State of Food and Agriculture: Climate Change, Agriculture and Food Security. Food and Agriculture Organization of the United Nations. Rome, 2016. ISBN 978-5-109374-0. FAO and Kiroka, United Republic of Tanzania.
- [3] Gadzama, N. M. (1995). Sustainable Development in the Arid Zone of Nigeria. Monograph Series No. 1, Centre for Arid Zone Studies, University of Maiduguri. University of Maiduguri Press, Maiduguri.
- [4] Intergovernmental Panel on Climate Change (2001) Climate Change: Impacts, Adaptation and Vulnerability, Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change .Cambridge University Press, Cambridge, UK.
- [5] Lake Chad Basin Commission (2016). Report on the State of the Lake Chad Ecosystem. Bonn: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.
- [6] O'Keefe, P.; Westgate, K. & Wisner, B. (1976). Taking the Naturalness Out of Natural Disasters. Nature, Vol. 260: 566-567.
- [7] United Nations Framework Convention on Climate Change (2011). Fact Sheet: Climate Change Science – the Status of Climate Change Science Today. Retrieved on 30/09/2019 from [https://unfccc.int/files/press/backgrounders/application/pdf/press\\_factsh\\_science.pdf](https://unfccc.int/files/press/backgrounders/application/pdf/press_factsh_science.pdf).
- [8] Wishat, I. (2009). Air Con: The Serious Inconvenient Truth About Global Warming. Howling at the Moon Publishing Ltd, Auckland New Zealand.