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CLIMATE CHANGE AND LIVELIHOODS IN THE LAKE CHAD BASIN

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Abstract

This study examines the implications of climate change on the livelihoods of communities around the Lake Chad Basin region. It adopted secondary source of data collection and the sourced data was analysed using content analysis. The finding of the study revealed that climate change has affected the socio-economic development of border communities in the Lake Chad Basin. Therefore, it concluded that the Lake Chad Basin Commission (LCBC) should enlighten the people in each community in the LCB on the adverse effect of climate change not only on their livelihoods but also on sustainable environmental development of the region.

Key words: Lake Chad Basin, Climate change, communities, livelihoods, terrorism, socioeconomic development

Introduction

The Lake Chad Basin (LCB) is one of the most important regions in Africa. The economic prosperity of the region is fundamental to achieving a befitting standard of living for the peoples in the surrounding and/or border communities. For the four border countries; Cameroon, Chad, Niger and Nigeria, the livelihoods of their people depend on the economic sustainability of the LCB. On the whole, LCB is not only important for the communities in the region but also for Africa in general; for whatever that happens to the region will definitely have ripple effect on "the world poorest continent" (Addae-Korankye, 2014:147).

The LCB representing about 8% of the total size of the African continent, with a population estimated at 40 million inhabitants as at 2010 (Lake Chad Basin Commission, LCBC, 2018), and the basin is of no small significance in Africa. Lake Chad is one of the world's largest and most historical Lakes in the Sahel region of Africa, precisely bordering North-Eastern Nigeria, North-Western Cameroon, South-Eastern Niger and South Western Chad republics (Abubakar, 2012). In the 1940s and 60s, according to the historians and some geo-archaeological and historical evidence the Lake was 25,000square kilometres and famous for being one of the largest water bodies in Africa (ThisdayLive, 21stSeptember, 2017; Abubakar, 2012). This was a great economic asset in the region.

Even though about 40 million people live in the region, about twenty two million people directly depend for their livelihood on activities carried out in the LCB and it has been a centre of development, trading and cultural exchange among the peoples living to the north of Sahara and those to the South (LCBC, n.d). The fishermen make a decent living off Lake Chad (Voice of America, VOA, 11th July, 2017), which provides job opportunities for millions, including

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labourers, artisans, food vendors, and fish merchants from different parts of the region (Olanrewaju, 2018). The fishes from the Lake are "amongst the most common and cheapest source of protein in the region" (De Young, Sheridan, Davies and Hjort, 2012:6). This, consequently, provides benefits and services for poverty alleviation, food security and contributions to national and regional economies (De Young, Sheridan, Davies and Hjort, 2012). The Lake, being extremely dynamic, constantly changing size, shape and depth in response to slight changes in annual precipitation and also linked to three main drainage systems; the Chari-Logone River subsystem (CAR); the Konadugu-YobeRiver subsystem (Nigeria); and the Yedsaram/Ngadda River Subsystem (Cameroon) (De Young, Sheridan, Davies and Hjort, 2012). The lake,

> 'is a source of water supply for drinking and a sound environment conducive to socio-economic development. It also offers a unique social and cultural environment contributing to the rich diversity of the region… in the 1960s, the best grazing land was in the Sahel zone of the Lake Chad Basin…good for extensive herding as there was rarely conflict with crop farming and it was estimated that seven (7 ha) hectares of land could feed one Tropical Livestock Unit for six (6) months of the year (LCBC, 2018:2).

Climate change, however, has changed the narrative in the LCB. The water of the Lake is said to have reduced drastically between 1350 and 1800 square kilometres (Abubakar, 2012; ThisdayLive, 21st September, 2017). Losing its traditional staples of water and vegetation which had sustained livelihood and bourgeoning economic activities for the people in the area (ThisdayLive, 21st September, 2017). It is undeniably correct to state that climate change has negative impact on the livelihoods of the communities in the LCB. Even though this might have engendered poverty in the region, the impact of climate change in the LCB could not be only economic in nature.

Consequently, this study attempts to examine the multidimensional impacts of climate change on livelihoods in the LCB. It is divided into five sections after this introduction. The first section is the theoretical framework, while the second is the conceptual analysis. While the ecological system theory is adopted as the theoretical framework, climate change and livelihoods are defined and conceptually linked together as it concerns the objective of this study. The third section focuses on the socioeconomic condition in the LCB. It examines the sources of livelihood of communities in the LCB. The fourth section deals with the analysis of the implications of climate change on the livelihoods of communities in the LCB. It examines the multidimensional impact of climate change in the LCB. The fifth and final section is the conclusion and recommendations.

Theoretical Framework

As earlier pointed out, the ecological system theory of Urie Bronfenbrenner is adopted as the framework of analysis for this study. Bronfenbrenner developed the theory from his work, the *Ecology of Human Development,* published in 1979. This theory has been redefined and adapted by various scholars, especially the environmentalists or the green thinkers of green

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politics that aim at the creation of ecologically sustainable world. Thus, the tenets of the theory are also embedded in ecologism and/or ecocentrism.

The rationale for the ecological system theory is based on the relationship between human behaviour and the environment (Ikehi, 2014). The theory states that all beings are fundamentally embedded in ecological relationships (Dauda, 2013). According to Ikehi (2014:104), the theory states that:

> Persons are in continual transaction with their environment. Environment affects behaviour; understanding the changes in the environment is a better way of adapting to the environmental changes; Systems (components of the environment) or subsystems are interrelated parts constituting an ordered whole (entire environment); Each subsystem impacts on all other parts and whole system; Systems can have closed or open boundaries; Systems always tend toward equilibrium.

It is believed that there are no convincing criteria, which can be used to make a hard and fast distinction between humans and non-humans (Dauda, 2013). Ethically, therefore, since there is no convincing reason to make a clear distinction between humans and the rest of nature, a broad emancipator project ought to be extended to non-human nature. As a natural corollary of the doctrine of sustainable development, the theory seeks to redefine the relationship between human beings and nature, and among human beings themselves (Gauba, 2003). It insists that human beings should no longer operate as the 'masters' of the natural world but as partners with other living organisms. This perspective also calls for a thorough-going change in the organization of human world itself.

The tenets of the ecological system theory are built on the fact that at the beginning of human civilisation, population was very small. People led a simple life. They were very close to nature (Gauba, 2003). Their needs were very limited. Whatever elements (like oxygen, nitrogen, carbon, etc.) they extracted from nature, those were replenished through the natural cycles. So the normal consumption by human beings did not cause any damage to nature. The stock of natural resources was so large and their consumption was so little that nobody could anticipate any shortage of these resources in the future.

The passage of time, however, led to the reverse of the sufficiency in nature. Consequently, ecological system theory is developed to remedy the adverse depletion of nature and provide for the ever-increasing demand of human being from nature. The theory has four central features. They are; resources conservation, human welfare ecology, 'preservationism' and animal liberation (Dauda, 2013). It recognises the full range of human interests in the non-human world as opposed to narrow instrumental economic interests in resources use. It also recognises the interest of the non-human community. As stated earlier, the theory is a corollary of the doctrine of sustainable development and it recognises meeting the needs of the present generation without jeopardising "the interest of future generations of human and non-human" (Dauda, 2013:69). This is why it adopts a holistic rather than an individual perspective with respect to population, species, ecosystems and ecosphere as a whole.

This theory is useful in this study as it provides guides in understanding the adaptive behaviours and actions that could be taken by farmers and other individuals in LCB whose

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source of livelihoods is agriculture and fishing for environmental sustainability of the region. It should be noted that understanding the change in behaviour in response to alterations in environmentis a necessary tool in proposing suitable agricultural practices and policies to conform to existing impacts of climate change in the LCB. This is because as a result of climate change in the LCB, there is increased shrinking of Lake Chad and other tributary rivers leading to switching of livelihood strategies by the farmers, pastoralists and fishers in the Basin. Furthermore, this theory isuseful to this study as it gives insights into adoptable measures by all stakeholders (governments in the region, peoples living there, development partners and supranational organisations) implementing adaptation mechanisms needed for farmers, pastoralists and fishers to survive and maintain their sources of livelihoods though the impacts of climate change are still prevalent in the region.It should be noted that the tenets of the theory can be situated in the doctrine of sustainable development, which believes in meeting the needs of the present generation without endangering the ability of the future generations from meeting their needs. This theory takes this further by including meeting the needs of non-humans and/or the nature.

Consequent upon the above, the theory is also applicable to this study in the sense that it explains the ecological relationships that exists among the people in the communities of the LCB and the nature that surrounds them. This explains the fact that human actions are parts of the incidents that culminate in climate change in the region. This is brought to the fore as the theory states that systems (different components of the environment) or subsystems (human activities in the LCB) are inter-related parts constituting an ordered or chaotic whole (entire environment). Therefore, the theory explains the intricacies in the relationship between human beings and nature in the LCB, and among human beings themselves in the region as well as how the actions of one (especially human beings) affect the welfare (causing climate change) of the other (the environment).

Conceptual Analysis

The two central concepts in this work are climate change and livelihoods. Even though each of them does not mean the same thing, the paper will establish the nexus between these concepts in line with the objective of this study.

Climate change ``

There are numerous works on climate change. Each of the works examines different angles of the concept making it seem *complex*. This is because it is the catch-all term for the shift in worldwide weather phenomena (Wired, Tuesday 15 May 2018) and the most uttered environmental term of present time (Rahman, 2013). It is perhaps the most complex and controversial concept in the entire science of meteorology (Todorov, 1986 cited in Werndl, 2016:3).

Generally, Werndl (2014) argues that there are two main kinds of definitions of climate discussed in the literature: distributions over time and ensemble distributions of the possible states of the climate variables. In a simple term, however, climate change has to do with a long time of change in atmospheric conditions and its impact on the globe (Akintola, 2016) due to

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human activities and natural phenomena. It is the changes in statistics of average temperatures, average number of rainy days, and the frequency of droughts over the years, decades, or even centuries to millions of years (National Research Council of the National Academies, 2012; Rahman, 2013). The changes are the results of natural variability or human activity (Ogbo, Lauretta and Ukpere, 2013). Apart from solar variability, natural gravitational and magnetic oscillations of the solar system induced by the planet's movement through space, Ocean ccurrent and cloud formation (Bast, 2010; 2013) among other natural causes of climate change, high level emission of carbon dioxide (CO_2), methane, nitrous oxide and other greenhouse gases (Akintola, 2016) are the anthropogenic causes of global climate change.

Noteworthy in the submissions of various international organisations that focus on climate change-related issues (Intergovernmental Panel on Climate Change (IPCC), the World Meteorological Organisation (WMO), United Nations Framework Convention on Climate Change (UNFCC), etc) and the arguments of scholars (Akintola, 2016; Rahman, 2013; Ogbo, Lauretta and Ukpere, 2013; Collier, Conway and Venebles, 2008; Okereke and Bulkeley, 2007; Meadowcroft, 2009) is the fact that even though climate change has both anthropogenic and natural causes, anthropogenic (human) causes take pre-eminence. Human activities compound climate change incidence because of poor climate governance. Poor climate governance is prevalent globally because there is no

> …resulting interaction and coordination requirements between different actors within and between activity levels and disciplines (that) need different forms of regulation…through a regulation mix, which includes statutory hierarchical forms of regulation as CO_2 emission limits, zoning maps, planning approval procedures or city development (Frohlich and Knieling, 2013:19).

Climate is poorly governed when adaptation and mitigation actions are not taken. It should be noted that adaptation in climate change-related issues has to do with adjustment of society to a changing climate and mitigation which requires shifts in current behaviour to end practices driving further climate change (Meadowcroft, 2007). As a result of poor climate change governance, therefore, the livelihoods of people are adversely affected.

Livelihoods

Livelihoods perspectives have been central to rural development thinking andpractice in the past decade (Scoones, 2009). Even though various studies (Scoones, 2009; FAO, 2007; Krantz, 2001; Organisation of American States, OAS, 2015) begin their analysis of livelihood from the definition provided by Chambers and Conway (1991), Ian Scoones, for instance, argues that any basic search of literature or development project material willuncover numerous mentions of livelihoods approaches, perspectives, methods and frameworks. According to him, in a mobile and flexible term, 'livelihoods' can be attached to all sorts of other words to construct whole fields of development enquiry and practice. These relate to locales (rural or urban livelihoods), occupations (farming, pastoral or fishing livelihoods), social difference (gendered, age-defined livelihoods), directions (livelihood pathways, trajectories), dynamic patterns (sustainable or resilient livelihoods)and many more. The focus of this study is on

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livelihoods that relates to occupations; the farming, pastoral and/or fishing communities in the LCB. The special focus, however, is on the impact of climate change on fishing livelihoods in the region.

Simply put, livelihoods are 'means of making a living', the various activities and resources that allow people to live a decent life (FAO, 2007:2). According to Young et al (2002) and Oxfam, livelihoods are ways in which people access and mobilise resources that enable them to pursue goals necessary for their survival and longer-term well-being, and thereby reducing the vulnerability created and exacerbated by conflict; it comprises the capabilities, assets and activities required for a means of living(cited in FAO, 2007). Noteworthy is to state that livelihood describes a condition of human living standard, though many scholars seem not to see it in this perspective. For instance, when International Recovery Platform (IRP) (n.d:1) submits that livelihoods can be described as "making a living", "supporting a family", or "my job", this, undoubtedly, is nothing but a description of standard of living. However, this standard of living may be befitting or not.

Consequently, livelihoods are believed to be well recognised by humans to inherently develop and implement strategies to ensure their survival (IRP, n.d). It enables people to earn a living to ensure that their basic needs are covered (OAS, 2015). This, however, can be at the individual or group level. Livelihoods at an individual level "is the ability of the individual to obtain the basic necessities of life, which are food, water, shelter and clothing" (Mphande, 2016:17). As a community of people doing similar things to survive, their livelihood is their ability to "access similar resources, share similar social and cultural values and have a comparable economic status" (FAO, 2007:3). This is because, as a group, it is believed that they share the same risks and kinds of vulnerability.

Even though the livelihood of a community is vulnerable to food insecurity due to the attack on the resources or assets (human, social, natural, physical and financial resources, FAO, 2007) that sustain such a community, the wealthy individuals within the same community have a wider choice of survival than the poor (Mphande, 2016). However, noteworthy is the fact that if there is an attack on the natural assets of the community, all members of the community are subjected to the same vulnerability context. This explains why all the members of communities in LCB are susceptible to food insecurity; for the attack on their source of livelihoods (majorly water resources), through climate change, make all of them vulnerable to low (agricultural) production. This is the reason for deducing the impact of climate change on livelihoods in the LCB from Chambers and Conway (1991) definition of the concept. In what seems like relating climate change (environment) to livelihoods, it is said that livelihoods have to do with:

> The capabilities, assets, income and activities people require…to cope with, and recover from, setbacks and stress (such as natural disasters and economic or social upheavals), and improve their welfare and that of future generations without degrading the environment or natural resources base (Chambers and Conway (1991) cited in OAS, 2015:11).

Therefore, even though Chambers and Conway (1991) may not have related climate change nor envisaged its impact on livelihoods, it is clear that climate change, especially in the 21st Century,

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has impact on standard of living of people globally. This is the reality of life for communities in the LCB. The vulnerability of livelihoods of communities in the region to food insecurity is heightened through climate change. Farming, animal husbandry andespecially fishing, livelihoods have come under heavy threat with the drastic reduction of water bodies of Lake Chad, which are the major resources and assets in the LCB.

Socioeconomic Condition in the Lake Chad Basin

Spanning the northern part of Cameroon, western Chad, south-east Niger and the north-east of Nigeria is an ecological advantage and availability of water resources that sustain livelihoods in the LCB.LCB has five bioclimatic zones; Saharan, Sahelo-Saharan, Sahelo-Sudanian, Sudano-Sahelian and Sudano-Guinea ecological zones (Dami, et al., 2011 cited in Ifabiyi, 2013). The surface area of the conventional basin is 967,000 squarekilometre, with a population from 30 to 50 million inhabitants (Ifabiyi, 2013; Lanzer, 2017; Ogbozor, 2016).Withthe various sources of water resources, Lake Chad being the most popular, make the basin fundamental to the socioeconomic livelihoods of its inhabitants.

The Basin has 7 hydrological units. The first is the Lake Chad. It is the 4th largest lake in Africa and6th in the world, with hydrographical basin area of 2,381,631 km^2, an active basin of 966,955km^2;a source of fresh water, fisheries, pastoral and agricultural land in the countries that it spreads across (Ifabiyi, 2013). Others are Lower Chari, Flood plains of the Logona, Komadogu-Yobe, Borno drainages, Bornu diagnostic basin and Lake Filtri (Fabiyi, 2013). Each of these sources of water is uniquely important in the sustenance of socioeconomic development of the region. For instance, Flood plains of Komadogu-Yobe is vital to food production in Nigeria, while Lake Filtri, because it is rich in pasture, is important for grazing (Fabiyi, 2013) across the region.

Therefore, Lake Chad Basin's water, banks and islands serve as major sources of livelihoods for fishing, farming/agriculture, and livestock rearing/animal husbandry (Ogbozor, 2016; LCBC, 1992). As sources of fresh water, fisheries and pastures, the Basin is a home to 120 species of fishes and 372 kinds of birds (Ifabiyi, 2013). This determines economic activities in the region. According to the LCBC:

> Farming, fisheries and herding are the most dominant activities, and it employs over 80% of the basin's population. The crops grown include cotton, groundnuts, cassava, millet, sorghum, rice, onions. The availability of agricultural raw materials led to the establishments of agro-allied industries such as cotton ginning, breweries, leather industry, and machinery, milling, and food industry (cited in Ogbozor, 2016:9).

In addition, there has been thriving cross-border trade in agricultural produce, fish as well as other goods and commodities in the LCB region (Nagarajan, Pohl, Rüttinger, Sylvestre, Vivekananda, Wall and Wolfmaier, 2018). Lake Chad is also said to act as a trading hub offering economic opportunities and resources of which people living around the Lake take advantage of.

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Consequently, the socioeconomic context of LCB is described as a complex system. This is despite the fact that, as pointed out earlier, agriculture (farming, pastoral and especially, fishing livelihoods) is predominant in the region. According to World Bank (2015:3), LCB is a highly productive socio-ecosystem and:

> It is characterized by the articulation of: mobility, multi-activity, and multi-functionality. Mobility refers to people responding to changing natural resources. Multi-activity means that a dominant proportion of the population of the Lake practice several activities (fishing, livestock, agriculture, and also trade, and crafts) to secure revenues. Multi-functionality refers to the successive use of the same space for fishing, agriculture, and livestock, following the rhythm of the annual floods and flood recessions.

Pitiably, there is the lack of implementation of effective national government's policies to support the working of the complex system to the advantage of the people (Nagarajan et al, 2018). With all the economic potentials of the region, most inhabitants of the region are poor. The Basin is considered thepoorest; most marginalised and neglected part of each respective country in respect to the provisions of basic infrastructures and social services (Ogbozor, 2016). Lemoalle&Magrin (2014) and Magrin et al (2015) also argue that human development indicators in the region are below national averages, which themselves are also low compared to the international standards (cited in Ogbozor, 2016) with much poverty, demographic pressure, and security threats (World Bank, 2015). Summarily, the socioeconomic context of the communities of the region is that of:

> Low socio-economic development indicators, low levels of education, high levels of poverty, low levels of national integration, historical government neglect and perceived and actual marginalisation...In all four countries, the region is seen as distant from the centre with politicians largely uninterested in its development (Nagarajanet al, 2018:10).

Climate change, however, is fundamental to one of the major reasons for pitiable standard of living in the region. Adverse environmental events have put the livelihoods of the communities in the Basin under intense pressure. It has increased the vulnerability of these communities to climate-related risks, especially food insecurity and unemployment. This has contributed to humanitarian crisis presently experienced in the region.

Implications of Climate Change on the Livelihoods of Communities in the Lake Chad Basin

With its vast pasture of cultivable land and wealthy fish stocks, LCB is an essential area both economically and environmentally to the sustenance of the livelihoods of the communities in the Basin (GIZ, 2015b cited in Awojobi, 2017). Specifically, in Nigeria, according to Ahmed

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Muhammed, the fishery in the region provides employment for over 2 million people, most of whom are engaged in fishing on a seasonal or part-time basis. The 150 000 tonnes of fish products produced from aquaculture which is important for food and income generation provides an alternative opportunity for vulnerable members of fishing communities (cited in De Young, Sheridan, Davies, Hjort, 2012). However, climate change has reduced the economic buoyancy of the region.

Noteworthy is to state that there are two drivers of climate change in the region. They are the seasonal migration of the Inter-tropical Convergence Zone (ITCZ) and the contrast between sea surface temperature and continental temperature in the Gulf of Guinea (German Federal Ministry of Economic Cooperation and Development, 2015). It is observed that during the past decades, the region was affected by several dry spells, marked by consecutive years of low rainfall, with impacts on water resources, vegetation covers and on agricultural production. The last severe dry spells in the region occurred at the beginning of the seventies and eighties. Since then, the region is gradually recovering, primarily driven by increasing seasonal rainfall. Eventhough, according to German Federal Ministry of Economic Cooperation and Development (2015), a general recovery from the droughts of the seventies and eighties to the 20th century can be observed, inter-annual rainfall variation is still high.

Of certainty is the fact that one-degree of global temperature rise contributes significantly to the decline of Lake Chad, which equates to destruction of people's vital resources and livelihoods (World Food Programme, WFP, 2016). As the Lake shrinks, "people settle in elevated areas of the former lake, making a living on fishing and farming" (German Federal Ministry of Economic Cooperation and Development, 2015:46). Over time, this will also lead to erasure of some fishing areas and combined with the reduction of fish stocks from overfishing and resulting from the Lake's recession, many fishermen have given up fishing to begin farming (German Federal Ministry of Economic Cooperation and Development, 2015). This has also led to migration of people to different parts of the Basin for survival. According to World Bank (2015), migration to LCB southern shores, for instance, intensifies pressure on resources for agriculture, fishing, and livestock farming in the rest of the lake area and resulting in conflicts.

Climate change thus engenders switching of livelihood strategies as the need for the shrinking water increased by farming activities and animal husbandry. Therefore, the chain "reactions have often heightened competition between farmers and other livelihoods" (WFP, 2016:32), leading to violent conflict in the Basin. This is because, as FAO (2017) notes, without agriculture and livestock support, many farmers and herders will resort to negative and sometimes irreversible coping mechanisms with long-lasting impact on their livelihoods. For instance, according to FAO (2017), climate change combined with the impact of terrorism, made 6.9 million people in the LCB food insecure during the 2017 lean season (June–August 2017). This has led to both humanitarian and ecological crisis in the region, according to FAO (cited in UN News, 11th April, 2017). Indeed, it is a double jeopardy for the LCB; Boko Haram activities and the negative impact of climate change are hitting hard on the people. Boko Haram activities have displaced over 2.4 million people and disrupted the livelihoods of hundreds of thousands of others (Daily Trust, 6th January, 2017). The sum of $2.2 billion is needed for humanitarian assistance in the region (Thisday Live, September, 21, 2017; ThisdayLive, 2nd August, 2018) because more than 10 million people are in urgent need of life-saving assistance and protection

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(UN Development Programme) and UN Office for the Coordination of Humanitarian Affairs (OCHA) (2018).Specifically, food insecurity remains high in the region. In fact, "Some 5 million people are food insecure. Parts of Chad and Niger have been hit by drought that has affected Sahel countries following poor rains in the 2017 season, leading to an early onset of the lean season" (UNOCHA, 2018:1).

On the assessment of the climate change implications for fishing communities in the LCB, the outcome of the workshop organised by FAO and LCBC in 2012 found that each of the five participating countries (Cameroon, Central African Republic, Chad, Niger and Nigeria) are affected as follows:

i. Reduction in water volume in Lake Chad and in the main rivers Chari and Logoon as well as smaller tributaries and in most cases permanent disappearance of pond since the dry season. This is exacerbated by irrigation for agriculture around the Lake and evapo-transpiration, further reducing water volume on the Lake and leads to increased pressure on water resources;
ii. Increased migration of fishers searching for better fishing grounds and increased movement of pastoralists searching for water sources moving both nationally and throughout other member states. This has increased localised conflict in the region over natural resources and land use;
iii. Increased spread of vector-borne diseases;
iv. Encroachment of aquatic weeds which disrupt ecosystems and access to the fishery resources through blocking of transport routes;
v. Deforestation and habitat destruction (including erosion of river banks and silting of the Lake); and
vi. Use of destructive fishing methods, such as using poison, or setting up net traps in bottle necks in water channels (cited in De Young, Sheridan, Davies, Hjort, 2012:3).

Even though annual fish production on the Lake still worth an average of US$ 60 million, fishers now need to migrate further to access fisheries and to transport their catches to the market (De Young, Sheridan, Davies, Hjort, 2012) due to the impact of climate change on the Lake Chad and the rivers feeding the lake.

The lake has shrunk from of its size in 1963 (Dieye, 2017) to a mere 1,350 square kilometres today (Thisday Live, September, 21, 2017). The result is degraded ecosystems, water shortages, crop failures, livestock deaths, collapsed fisheries, increased soil salinity and, as a result, increased poverty (Dieye, 2017). This also has a multiplier effect on the communities beyond the region. In fact:

> The inhabitants of the entire perimeter are indirectly affected through the food security and employment opportunities that are connected to the lake and its resources, e.g. through trade and value chains linking the lake resources to markets (Nagarajan et al, 2018: 22).

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This attests to the multifaceted impacts of climate change in the LCB. As it has been pointed out, this, in the long run, leads to increased poverty in the communities in the LCB. However, for the communities beyond the region, the multiplier effect of climate change emanating from LCB ranges from lack or inadequate access to water, adequate fishes, pitiable standard of living, lack of access to markets, among others. In addition, with time, climate change will heighten competition to the already scarce (water) resources in the LCB. This is inescapable as it is projected that the population in the Lake's basin will double over the next 30 years, likely causing an increase in water withdrawals for human consumption, irrigation, and industries (World Bank, 2015).

Conclusion and Recommendations

Undoubtedly, LCB is one of the most important regions in Africa. This study has demonstrated that cutting across four countries (Cameroon, Chad, Niger and Nigeria) and directly impacting Central African Republic, the socioeconomic importance of the Basin to the communities around it cannot be overemphasised. This study has also demonstrated the socioeconomic dynamism and complexity embedded in the LCB. The water resources in the area support the sustainability of the livelihoods of peoples in the region. The natural resources provide direct and indirect jobs for millions of people; the fishermen, labourers, artisans, traders, food vendors, fish merchants, pastoralists, farmers, transporters, among others. Also, the many species of fishes in the Basin are sources of protein to the inhabitants. The same water enhances the health and sanitation in the LCB.

However, some of the socioeconomic benefits derived by the communities surrounding LCB are diminishing speedily. As it has been demonstrated in the study, it is due to the negative impact of climate change in the region. The double jeopardy of Boko Haram activities and the negative impact of climate change have engendered forced migration and change of survival strategies by the people of the region. Because of the fact that some fishing areas are vanishing, people are changing livelihood strategies; from fishing to farming and farming to animal husbandry. This has heightened conflict in the region and deepening of poverty, food insecurity, as well as national and regional economic underdevelopment.Consequently, it is recommended that:

i. The LCBC should enlighten the people in each community in the LCB on the adverse effect of climate change not only on their livelihoods but also on sustainable environmental development of the region. This becomes imperative in order to curb all the environmental-unfriendly behaviours and actions of the people. They should be enlightened, for instance, on the adverse effect of using environmentally dangerous methods of fishing such as the use of chemical and/or poison, explosives, excessive exploitation of choice species, among others.
ii. Since FAO has recognised that the crisis in the LCB is both humanitarian and ecological, it should enlighten, teach and empower the communities in the region on

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sustainable farming system. This would not only help in solving the crisis of food insecurity but also bring about environmental or climate sustainability.

iii. Even though the region seems far away from the central administrative capitals of Cameroon, Chad, Niger and Nigeria, this should not be an obstacle to these governments from lending the first helping hands by providing for the humanitarian needs of their peoples. Though the needs of the people might be intimidating (based on the estimated amount of money needed for humanitarian assistance in the region), any support given by the governments would go a long way to assist the peoples.

iv. The assistance required from the international communities and development partners is not only on creating awareness on the crisis in the LCB, the WFP, FAO, UNDP, UN OCHA among others,should mobilise the world to come together and help solve the humanitarian and ecological crises in the region.

v. Even though FAO has been able to identify what I call double jeopardy in the LCB (humanitarian and ecological crisis), the emphasis in the development circles is on the contribution of Boko Haram activities to the crisis. Therefore, FAO, UN OCHA and other agencies of the UN should also give the deserved emphasisto the nexus between climate change and the crises in the region.

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