Environmental Degradation, Livelihood and Conflicts: A Focus on the Implications of the Diminishing Water Resources of Lake Chad for North-Eastern Nigeria

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Abstract

Lake Chad has been a source of economic livelihood for millions of people inhabiting the catchment areas in the four riparian states, namely: Cameroon, Chad, Niger and Nigeria. However, in the last four decades, the size of the lake including its resources has continued to diminish. The impact of this depletion is being felt by Lake Chad basin population who depend on the lake for their means of livelihood. This paper focuses on the diminishing natural resources of Lake Chad as an empirical referent to analyse the relationship that can develop among natural resource diminution, livelihood and conflicts. Of particular attention is the incidence of conflict between and among fishermen, pastoralists, farmers and sometimes state security agents, and the tendency of the

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conflicts to degenerate into large scale intra-ethnic, intra-state and inter-state conflicts. The paper further draws attention to the implications of the diminishing water resources of the lake for the North-East zone of Nigeria, and makes recommendations suggested by the analysis.

Introduction

The relationship between environmental (natural) resources, livelihood and conflicts has long been established in literature. Environmental resources are critical to the survival of people and nations, both for subsistence and for economic mainstay. In some circumstances, access to or control of the resources of an environment has been a contentious issue often generating tensions and violent conflicts within, between and among nations. More often, a traditional type of analysis of resource issues as they relate to conflicts focuses on 'hard' resources such as strategic minerals, to the neglect of 'soft' resources (Bissel 1996:143) such as water, food, and land. This marginal attention exists in the face of one obvious reality: people derive their living from land, water, and other livelihood-sustaining resources, and fierce competition for them underlies conflicts in some parts of the world.

Interestingly, familiarity with existing literature on conflicts, particularly in Africa, suggests that an overwhelming percentage of these conflicts are resource-based conflicts (Masari 2006:4). The unfolding scenario in the Lake Chad basin, straddling the borders of Nigeria, Chad, Niger and Cameroon, is a nodal example in this regard. The rich water resources of the lake have been a source of economic livelihood, sustaining over 20 million people inhabiting the catchment areas of the four riparian states. However, in the last few decades, the size of the lake as well as its resources has continued to diminish. The impact of this depletion is being felt by the Lake Chad basin population who depend on the lake for their livelihood. Particularly worrisome is the rising incidence of conflict between and among fishermen, pastoralists, farmers and sometimes also

state security agents, and the tendency of the conflicts to degenerate into large scale intra-ethnic, intra-state and inter-state conflicts.

Against this backdrop, the present article addresses the following questions. What factors are responsible for the diminishing resources of the lake? What is the nature of the relationship between resource degradation, livelihood and conflicts in the context of the Lake Chad? And what are the implications of the diminishing water resources of the lake for the North-Eastern region of Nigeria? Following this introduction, we clarify the key concepts used in this discourse, and then proceed to a brief treatment of the theoretical framework within which we pose these questions. The rest of the discourse is subsumed under the four remaining substantive thematic sections.

Conceptual Explications

Given the tendency, particularly in the social sciences, for concepts to elicit varying interpretations, we will clarify our usage of these concepts – environmental resource scarcity, livelihoods and conflict – as a means of understanding their linkages in social existence.

The concept of *environmental degradation* refers to a situation of declining resources of an environment. In general, the environment provides all life support systems of every human society. These life support systems are built and sustained by the natural resources found in air, land and water. These resources include fresh/safe water, fish, arable land, plants, animals, mineral resources, air, among others. These resources often come in variable quantity and quality. Humans therefore exploit these resources for survival and sustenance. The misuse or over-use of these resources affects their quality and/or quantity in comparison with their pristine availability in the environment. Therefore, the issue of environmental degradation comes into play when these resources diminish in quantity or quality, or both.

According to Miller (cited in Jimoh 2006:276), environmental degradation refers to:

> The downward trend in the environmental resources such that their level of use in the human societies equally decreases at an increasing rate.

The problem of environmental degradation has generated both global and local attention. While international environmental concerns are usually couched in broad terms like climatic change and desertification, the environmental problem of concern to local settings and vulnerable groups is generally localised in nature, revolving around immediate issues that threaten their livelihood and survival. Examples include deterioration of rangeland, deforestation, degradation of topsoil, inappropriate disposal of waste, depletion of fresh water, pollution of air and water systems, and animals facing extinction. These problems directly or indirectly impact on human well-being. For example, declining soil fertility leads to poor crop yields while rangeland depletion reduces animal productivity, and any deterioration in water quality adversely affects the fish fauna.

Thus, environmental degradation refers to the process or a situation of depreciation in quantity and/or quality of the resources of the environment such as air, water resources, mineral resources, land, flora and fauna, as a result of harsh climatic factors, pollution and/or unsustainable exploitation by man. One notable implication of environmental degradation for social existence is that it usually disrupts the socio-economic life of the human population who are immediately dependent on natural resources for sustenance (Onuoha 2008a:1027). In most social contexts where there are weak regulatory mechanisms in a society, it can exacerbate the level of competition amongst the dependent population, and may engender conflicts.

The term '*livelihood*' entails an ensemble of activities, capabilities and resources needed to organise and maintain a living. A livelihood,

according to Chambers and Cornway (cited in De Satage 2002:4), comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. Livelihood best expresses the idea that individuals and groups strive to make a living, attempt to meet their various consumption and economic necessities, cope with uncertainties, respond to new opportunities, and choose between different options (Ouden, cited in Legesse 2006:43). The term livelihood gained much analytical relevance in the late 1990s when the idea of *sustainable livelihood* was popularised as a relatively coherent and integrated conceptual approach to reflect the environmental concern of the development efforts of international organisations.

Sustainable livelihood lays emphasis on the livelihood system of marginal groups, particularly the poor, and the way in which they adapt to maintain their livelihoods under conditions of severe environmental, socio-economic and political stress. A livelihood is therefore perceived to be sustainable 'when it can cope with and recover from shocks and stresses and maintain and enhance its capabilities and assets both now and in the future, whilst not undermining the natural resource base'. In this sense, Titi and Singh (1994:31) are of the view that sustainable livelihood entails:

> People's capacity to generate and maintain their means of living, enhances their well-being and that of future generations. These capacities are contingent upon the availability and accessibility of options which are ecological, economic and political and which are predicated on equity, ownership of resources and participatory decision making.

Therefore, the idea of livelihood is concerned with both environmental influence on human life and human influences on the environment. It focuses on the nature and quality of the relationship between human communities and the ecosystem: how the environment provides the resource base for human existence and how the nature of exploitation

of these resources by human communities enhances or undermines the natural resilience of the environment. It captures the intricate web of interaction between human communities and their environment in which people's quest for generating and maintaining their living creates both environmental and survival problems. The environmental problems capture the various instances of environmental degradation, while the survival problems are concerned with issues of struggle and conflict over access or control of these environmental resources.

The term '*conflict*' has been variously conceptualised. However, the multiplicity of definitions has always pointed at one fact: that conflict is an enduring aspect of social existence. It is believed that wherever a community of individuals is found, conflict is basically a part of their experiences. Thus, most conflicts are social in character and usually arise as human beings pursue their different survival and security needs. In this regard, Stagner (1967:16) defines conflict as:

> A situation in which two or more human beings desire goals which they perceive as being obtainable by one or the other, but not by both; each party is mobilizing energy to obtain a goal, a desired object or situation and each party perceives the other as a barrier or threat to that goal.

While Stagner conceives conflict from the point of view of incompatibility of goals, Coser (1956:3) perceives it in terms of the struggle between parties over desirable values. According to him, conflict refers to:

> Struggle over values or claims to status, power, and scarce resources, in which the aims of the conflicting parties are not only to gain the desired values, but also to neutralize, injure or eliminate their rivals. Such conflicts may take place between individuals and collectivities.

Although conflict may be conceived from different perspectives, one crucial defining element of it is the presence of two or more actors struggling to secure a thing of value or adjudged to be valuable of which the gain by any of the actors amounts to a loss or deprivation to the other

actor(s). The benefit that goes with access to or control of the 'valuable' and the deprivation or insecurity that follows denial of access underlie all conflicts. In this wise, Mark and Synder (1971:8-9) contend that a key element of all conflicts is the existence of resource scarcity where the wants of all actors cannot be fully satisfied and where the quests for such resources result in conflict behaviour.

Conflict, in this context, is defined as a situation of struggle between and/or among opposing individuals, groups, communities or states over certain perceived desirable values arising from differences in the action of any of the parties in the quest to realise or secure those values. The struggle may be over tangible values such as money, property, land, water, mineral resources, or animals. It may be intangible values such as power, influence, title, respect, and position, to mention but a few. Conflict thus arises from the interaction of individuals or groups who pursue incompatible goals using incompatible means, leading to a situation of deprivation for any of the parties. It assumes a violent dimension when: (i) there is no superior force or effective regulatory mechanism to balance the struggle and thus prevent the situation from becoming more intense, and (ii) the parties involved employ physical force or lethal means to inflict injury and damage, or to eliminate the opponent in the quest to secure the value(s) at stake.

Having clarified our concepts, we may proceed to present the theoretical framework within which we posed our questions.

Theoretical Framework

The link between environmental resources and conflicts has engaged the mind of scholars as Suhrke (1996), Baechler (1998), Percival and Homer-Dixon (1998), Homer-Dixon (1999) and Gleditsch (2001). Against this background, Homer-Dixon articulated the theory of eco-violence which we may usefully adopt here. Homer-Dixon and Blitt (1998) argue that large populations in many developing countries are highly dependent

on four key environmental resources that are very fundamental to crop production: fresh water, cropland, forests and fish. Scarcity or shrinking of these resources as a result of misuse, over-use or degradation under certain circumstances will trigger off conflicts. According to Homer-Dixon (1999: 30):

> Decreases in the quality and quantity of renewable resources, population growth, and unequal resource access act singly or in various combinations to increase the scarcity, for certain population groups, of cropland, water, forests, and fish. This can reduce economic productivity, both for the local groups experiencing the scarcity and for the larger regional and national economies. The affected people may migrate or be expelled to new lands. Migrating groups often trigger ethnic conflicts when they move to new areas, while decreases in wealth can cause deprivation conflicts.

The fundamental theoretical assumption of the theory is that resource scarcity is the product of an insufficient supply, too much demand or an unequal distribution of a resource that forces some sector of a society into a condition of deprivation. These three sources of scarcity are in turn caused by variables such as population growth, economic development and pollution. Thus, environmental resource scarcity will constrain agricultural and economic productivity, further inducing the disruption of economic livelihoods, poverty and migration. Migration can occur either because the environmental quality of a habitat has become unliveable or, more commonly, because the migrant's economic outcome is likely to be better in areas with greater resource availability. Both constrained productivity and migration are likely to strengthen the segmentation around already existing religious, class, ethnic or linguistic cleavages in a society (Gleditsch & Urdal 2002:286), and thus precipitate conflicts.

In this regard, Homer-Dixon (cited in Gleditsch & Urdal, 2002:285) presents his notion of environmental (or resource) scarcity with a pie

metaphor: qualitative degradation or quantitative depletion reduces the total size of the pie. A growing number of people sharing the pie imply that each share of the pie shrinks. And finally, if the pie is distributed in pieces of unequal sizes, some may be too small for people to survive on.

Within the context of Lake Chad, the eco-violence theory is analytically fecund to capture, if not explain, the intricate linkages that can develop between environmental resource scarcity, livelihood, and conflicts. In the Lake Chad area where rapid population growth and converging environmental trends contribute to the shrinking of the Lake, conflicts in the basin are likely to worsen considerably as resource scarcities interact with, or exacerbate other conflict-related social variables.

The Lake Chad Basin: Socio-Economic Importance and the Potential for Conflicts

The Lake Chad hydrological basin is located between latitudes 6° and 24° N and longitudes 7° and 24° E. The single most important geographical feature of the basin is Lake Chad itself. Lake Chad is believed to be a remnant of a former inland sea which has grown and shrunk in tandem with changes in climate over the past 13,000 years. It is an extremely shallow lake – rarely more than 7m deep – and has been susceptible to the increasing climatic variability and human impacts in the past 40 years. At its largest size, around 4000 BCE, the lake is estimated to have covered an area of 400,000 km^2. In the 1960s it had an area of more than 26,000 km^2. Between 1966 and 1997, it shrunk from 25,000 km^2 to less than 1,500 km^2 (Coe & Foley 2001). And between 1994 and 2004, it receded further dramatically, covering just an area of some 532 km^2. In essence, the lake has shrunk by about 90% of its size in 1960 (Masari 2006:2).

Figure 1: Map showing the Shorelines of Lake Chad and the Riparian States

Source: <http://encarta.msn.com/map_701513908/lake_chad.html>

Lake Chad is one of Africa's largest lakes, providing fresh water and other resources to more than 20 million people living in about thirty shore-line communities of the four riparian countries – Chad, Cameroon, Nigeria and Niger – which along with the Central African Republic (CAR) make up the conventional Lake Chad Basin Commission (LCBC). This includes 11.7 million in Nigeria, 5.0 million in Chad, 2.5 million in Cameroon, 193,000 in Niger and 634,000 in Central African Republic (Science in Africa 2003). It is located in the far west of Chad, bordering on North-eastern Nigeria. In terms of the conventional basin area, the distribution of the area among the riparian countries is as follows: 42% in Chad, 28% in Niger, 21% in Nigeria and 9% in Cameroon.

The Lake Chad Basin is drained by numerous rivers – the Chari-Logone, Komadugu-Gana or Lesser Yobe Ebeji, Ebeji Mbuli, Botha El Beed, the

Yedseram, Ngadolu, Ngadda, Komadugu-Yobe, Taf-taf and Serbewel. Of the above rivers, the river Chari – along with its tributary, the Logone – provides 90 per cent of the inflow to the lake, while the remaining 10 per cent comes from the Komadugu-Yobe river system. Three-quarters of the water entering the lake north of N'Djamena originate from headwaters in the Central African Republic and, to a lesser extent, Cameroon.

The lake which is located in the semi-arid region of the Sahara Desert is a vital source of fresh water and other resources for human, livestock and wildlife communities. The main economic livelihood in the basin includes fishing, agriculture and pastoralism. Fishing is one major occupation around the lake and all four riparian countries heavily depend on supplies from the lake. It is believed that over 150,000 fishermen live on the lake shores and its islands. At the peak of its production in the 1960s, the Lake Chad fisheries are said to have included fish of close to 80 species with an estimated annual fish catch of 130,000 to 141,000 tons up to the early 1970s. Recent estimates of annual fish production are said to be close to that of 1977, hovering within the range of 60,000 to 70,000 tonnes (Living Waters 2003). However, as a result of environmental changes since the 1970s, including fluctuations in the level of the lake, there have been considerable changes in the fish fauna. These include high mortality, the disappearance of some open-water species, and the appearance of species adapted to swamp conditions in areas where they were previously unknown (<http://assets.panda.org/downloads/mrwlakechadcasestudy.pdf>).

The raising of cattle, sheep and camels by local as well as nomadic herders provides additional means of economic livelihood in the basin. The lake which provides water and grazing lands for pastoralists and herders has been the traditional convergence point for the pastoralists: Tuareg, Toubou, Feda, Kanembu, Shuwa, Fulani and Wadai from Chad, Niger, northern Cameroon and northern Nigeria (James 1989:309). Some people raise livestock, typically moving closer to the lake for grass

in the dry season, then moving away in the rainy, mosquito season when some graze their animals up to 100 km away. After the droughts of the 1970s, many herders shifted from grazing animals like cattle and camels to browsing animals such as sheep and goats (Schneider 1985:60).

In addition to direct support to livelihoods, the lake serves as a veritable source of fresh water for drinking, sanitation and irrigation. The lake provides the water and the agricultural springboard for the production of commodities such as cotton, groundnuts, sorghum, cassava, millet, rice maize and onions. Most of the farming in the basin is rain fed, harvested by hand and cultivated without the use of fertilisers or other agro-chemicals.

As the fresh water and other resources of the lake continue to diminish, economic livelihoods have been significantly disrupted such that local populations relying on the lake for their survival have followed its receding waters. The result has been the incidence of resource conflicts within the basin.

Factors Responsible for Diminishing Resources of the Lake

In terms of the drastic diminution of the lake, three factors figure prominently: climatic changes, unsustainable exploitation of its resources by riparian states, and demographic pressure.

Climate change or fluctuation is one major factor in the drying up of the lake. The impact of climate change and fluctuations on Lake Chad hacks back to many decades. Early study on the hydrological history of the lake has found that the balance between water intake and evaporation is continually fluctuating, with the result that Lake Chad, because it is so shallow, is continually changing its size and shape. These fluctuations may be seen as of three different kinds: long-term, short-term and seasonal. They reflect variations in rainfall not only in the area of the lake itself but particularly in the watershed areas of the feeder rivers.

Fluctuations in the lake are thus a fairly sensitive indicator of climatic change over a substantial area of Africa (Connah 1981:21).

The impact of climatic variability, particularly the significant decrease in rainfall in the basin since the 1960s, has adversely affected the lake. There has been a decrease in the number of large rainfall events and in river inflows into the lake. Over the last 40 years, the discharge from the Chari/Logone river system at the city of N'Djamena in Chad has decreased by almost 75 per cent, drastically reducing the inflow into the lake. Coupled with this reduced rainfall is the problem of intermittent droughts. The region has experienced a series of back-to-back droughts in the 1970s and the 1980s which left serious adverse effects on the lake such as decreased flows in the major rivers that feed into the lake; falling of groundwater tables; disappearance of specific plant species and reduction of canopy cover; loss of wildlife populations; and increased soil erosion and/or loss of fertility.

Also, unsustainable exploitation or use of water resources of the lake by both the riparian states and local inhabitants is among the factors driving the lake to extinction. Large and unsustainable irrigation projects and impoundments built by Niger, Nigeria, Cameroon and Chad which have diverted substantial water from both the lake and the Chari and Longone rivers have greatly contributed to the shrinking of the lake. Most significant was the construction of both the Yaguou-Tekele dyke (on the Chari-Logone) and the Maga dam by Cameroon in 1979, and a series of dams by Nigeria such as the Tiga Dam on River Yobe, the Alau Dam on River Ngadda, and the Yedersdam Dam on River Yedersdam. Other examples of such projects include the South Chad Irrigation Project (SCIP) in Nigeria and the MAMDI Polder Project in the republic of Chad.

Coe and Foley (2001) contend that the competing demands for fresh water by the four riparian states of Lake Chad, mostly through massive irrigation projects, account for almost 30 percent of the observed decrease in lake area since the early 1960s. Until about 1979, irrigation had a modest

impact on the hydrology of the region. But between 1983 and 1994, the amount of water diverted for irrigation quadrupled over water used for the previous 25 years, accounting for 50 percent of the additional decrease in the size of the lake. In addition to the radically reduced lake surface area, the flow of water from the primary river system that feeds it has decreased by almost 75 percent over the past 40 years.

While irrigation projects have contributed to the drying up of the lake, the decreasing water level has in turn affected irrigation projects. For instance, the SCIP was designed to irrigate 67,000 hectares, but as water levels in the lake dropped in the late 1980s, no irrigation could take place. The SCIP had an unintended spin-off. Its dried-up canals have been taken over by the *Typha australis*, a rhizomatous plant that has offered a convivial habitat for the dreaded Quelea bird. The regular loss of rice and other grain crops to large flocks of Quelea birds has added additional pressure on the already fragile livelihood system of the lake basin population.

Beyond the vagaries of climate and unsustainable exploitation of the water resources of the lake, the surge in human population in the last few decades has also conduced to increased exploitation and degradation of the water resources of the lake. Harden (1968:238) has long hypothesised that Africa's growing population is the major cause of the degradation and pollution of most of the continent's lakes. With marked population increases, human activities have begun to play a more significant role in accelerating lake-level declines. Since the 1960s, human demands for water near Lake Chad have grown rapidly. Between 1960 and 1990, the number of people living in the lake's catchment area has doubled from 13 million to 26 million (UNEP 1999:398). It is currently estimated to be slightly above 37 million (UNESCO 2007). The average population growth within the basin is quite high, being 2.4-2.6% (Odada et al 2004).

Invariably, this population surge translates into increased pressure on the water resources of the lake by local people living around the lake. Growing human population in the lake region has necessitated the raising of increased numbers of livestock to feed the teeming population. The combined effect of the surge of both human and livestock populations is the accelerated exploitation of the resources of the lake by local inhabitants to sustain their survival and that of their livestock. It has led to overgrazing, unhealthy agricultural practices and intense fishing to feed the growing population (Onuoha 2008b). One impact of this is the destruction of the carrying capacity of the lake to replenish itself. In spite of the worsening state of the lake, researchers predict some 75% population increase by 2025 (Sambo 2006:2).

The foregoing analysis shows that the downward spiral of the diminution of Lake Chad is a rather complicated and intricate process engendered by the complex interaction between human activities and global climate change. To recap, as unsustainable abstraction of the water of the lake increases, coinciding with unpredictable rainfalls in the basin, the natural resilience of the lake began undergoing much pressure. As the climate became drier, the vegetation that supported grazing livestock began to disappear. Consequently, many herders shifted from grazing animals to browsing animals, which adversely affected the area's vegetation by consuming the remaining woody plants. In addition, the local people became more and more dependent on the remnant of the lake as a source of water to replace the water they had previously obtained from the monsoons.

Thus, human activities in the basin significantly exposed the natural environment of the lake to the harsh impact of climate change. Climate change in turn has compounded the shrinkage of the lake by squeezing its natural resilience (Onuoha 2008b). Put more simply, human pressure on the lake is the result of poor rainfall, itself the consequence of climate variation triggered by human actions. The dramatic shrinking of the lake

has left adverse impacts on the environment, economic activities and livelihoods, thus creating a situation conducive to conflicts.

Environmental Resources, Livelihood and Conflicts: The Lake Chad Experience

Water in the form of rivers, lakes or streams is a source of human interdependence, supporting and binding the livelihood of people. In this regard, a transboundary watercourse poses a very different challenge: it crosses a national frontier, linking users across borders and supporting different economic livelihoods.

Lake Chad as a transboundary lake in the West Africa region has served the above purpose for many decades. The lake has been a vital source of fresh water and other resources sustaining millions of people whose livelihood is directly linked to the ebb and flow of this important water formation. In addition to direct support for livelihoods, the lake also plays an important socio-economic role in regulating annual water supply, recharging groundwater and helping to control flooding. However, over the past forty years, the water of the lake has continued to diminish. This in turn has disrupted aquatic and other terrestrial ecosystems, the quantity and quality of fresh water, and the wider environment. Problems include reduced fish fauna, siltation, loss of vegetation, and grazing land.

Given the increasing depletion of the water resources of the lake, the major livelihoods – fishing, agriculture and pastoralism – have continually evolved different strategies to cope with the harsh environmental situation. For instance, the decreasing level of surface water for fishing has prompted some fishermen to either shift from relying entirely on fishing to farming or change their fishing method. The more adaptive ones now practise a form of 'enclosure fish culture' in which canals leading to dry depressions in the lakebed are dug. Water flows into the depressions, and fish are allowed to move into the relatively deeper water.

The canals are then blocked off and the fish allowed to grow and are later harvested (Science in Africa 2003). This has contributed to the high rate of depletion of the fish fauna in the lake.

More so, the shrinking of the lake has made agriculture precarious. The local people now resort to an inappropriate cultivation practice known as lake-bottom cropping or receding moisture cultivation which further exposes the lake to severe climatic impacts. The marked expansion of valley-bottom cultivation in Nigeria since the 1980s has meant that pastoralists and farmers now compete very directly for access to wetland areas with a consequent increase in conflict (Blench 2004:ii).

Pastoral communities have also been affected by the recession of Lake Chad since pasture has become very scarce around it. Cattle herders have been burning the sparse coarse vegetation that is left in the hope that new plant life will sprout and prove a more palatable diet for their livestock, but there is no evidence that this works. Instead, the process seems to loosen the dry soil and make it more susceptible to erosion (Science in Africa 2003.

The disruption of economic livelihoods as a result of the shrinking of the lake generated two conflict-prone variables: firstly, increased competition among the various livelihoods over the available water resources and secondly, increased human migration within the basin. Human migrations in the basin have been a function of economic-driven movements of pastoralists, farmers and fishermen in search of areas of better opportunities. As human population increased over the years, both competition over the lake's dwindling resources and the rate of migration have equally increased. Invariably, the situation in the basin suggests intricate linkages among population increase, resource depletion and migration patterns. This has created a complex web of interaction that underpins conflicts in the basin.

For instance, prior to independence, the lake has been a source of fresh water, fishing and grazing ground for farmers, fishermen and pastoralists

of different nationalities, and there was an infrequent and minor incidence of conflicts. However, with the emergence of international boundaries following formal independence as well as the recent population surge, conflicts over the resources of the basin such as fishing and grazing lands have assumed a frequent and sometimes violent nature. Conflicts over the resources of the lake manifest in two forms: conflicts of *ownership* and conflicts of *use*.

Incidences of *conflict of ownership* occur when the struggle over the resources of the lake borders on the question of which territory of the riparian states has the right to appropriate the resources of the lake. Conflicts of ownership usually involve parties from different nationalities. At the heart of these conflicts is the issue of struggle over water and fishing rights and it usually assumes both intra-state and inter-state dimensions. The issue of increased competition between the users has lead to rampant conflicts between downstream and upstream users (*The Guardian* 2000:20). Conflicts over fishing rights have been an important aspect of conflict of ownership in the Lake Chad waters in recent times.

This situation has been complicated by boundaries which have become more blurred as the diminution of the lake has intensified. Local populations relying on the lake for their survival have followed its receding waters. The result is a complex web of social, economic, cultural and political issues, threatening constantly to spill over into human rights and military tensions. For instance, in the early 1980s there were various allegations of very serious infractions and dehumanising treatments meted on Nigerian fishermen by Cameroonian and Chadian gendarmes. In one such occasion in 1983, the skirmishes resulted in the loss of 9 Nigerians and 75 Chadian troops, while 20 Nigerians and 32 Chadians were reported captured. Similarly, Nigerian fishermen and fish dealers operating from both the waters of Lake Chad and the various fishing villages on the Nigeria-Cameroon border have reported a repeated incidence of physical assaults, and often, incarceration

without the due process of law (Okon-Ekpenyong 1989:300). Conflicts over competition for the resources of the lake have continued to manifest as the lake diminishes. Recently, a Nigerian fisherman, Sanusi (cited in Murray 2007), contended that:

> It is difficult to determine boundaries on water, yet the gendarme from Cameroon and Chad always come after us and seize our fishing nets and traps and we have to pay heavily to get them back.

The second form of conflict in the basin is the *conflict of use*. It is conflict of use when it basically involves struggle over how the use of the resources of the basin affects or disrupts the livelihood of other users. At the heart of these conflicts is the competition for access to water and pasture and it usually assumes inter-livelihood or inter-ethnic dimensions. Fresh water in the form of rivers and lakes binds the livelihoods of people. The unique role of water as a shared resource that provides an input into the productive systems that maintain livelihood creates the very potential for conflict when competition over it intensifies as a result of decline in supply.

Given that water is a common thread that knits together the major livelihoods system (fishing, pastoralism and farming), the dynamics of water in the lake has made these livelihoods less complementary and more competitive. For instance, the diminution of the lake has adversely affected irrigation. The extant irrigation projects in turn have contributed to the reduction in the quality and quantity of water in the lake. This has affected both the fish fauna and the vegetation in the area; thus, leading to the switching of livelihoods (particularly from fishing to farming) and intense exploitation of the lake's water. Progressive diminution of waters of the lake forces farmers to migrate closer to the lake's shorelines. By farming on the emerging areas which hitherto afforded grazing lands for pastoralists, it heightens the frequency of the struggle between two of the major livelihoods in the basin – farming and pastoralism (Onuoha 2007:72). The need to ensure the survival of their livestock makes

pastoralists and herders to move indiscriminately through the farms in search of scarce water and pasture which surround the surviving lake. Consequently, the destruction of farms by grazing animals leads to conflicts, with serious injuries and death reported at times.

Although conflicts of resource *use* are common in the basin, and highly under-reported, the degree of conflict between different resources users ranges from insignificant to extremely tense, but conflict between pastoralists and farmers far outweighs all other types of resource conflict in frequency and importance in the Lake Chad area.

Implications of the Diminishing Resources of the Lake for North-Eastern Nigeria

Geographically, the portion of Lake Chad that is situated in the Nigerian territory borders on the North-Eastern region which consists of the current six states of Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. Of the estimated 20 million people that lived on the Lake Chad basin in 2003, about 11.7 million live in the North-Eastern region of Nigeria. Already, the effect of the Lake Chad shrinkage is being felt by the local population who depend on the lake for their livelihood. Hence, further shrinkage of the lake poses serious security implications for the North-Eastern region of Nigeria in particular, and the country in general.

First, the diminishing water resources of the lake will compound the problem of water security/scarcity in the region. Water scarcity occurs when the amount of water withdrawn from lakes, rivers or groundwater is so great that water supplies are no longer adequate to satisfy all human or ecosystem requirements, resulting in increased competition between users and demands (UNEP 2002). Interestingly, Nigeria has been fingered as one of the African countries likely to suffer water stress in 2025 (UNEP 2002). On the other hand, water security is about ensuring that every person has reliable access to enough safe water at an affordable price to lead a healthy, dignified and productive life, while maintaining

the ecological systems that provide water and also depend on water (UNDP 2006:12). These problems pose serious threats to human security in the North-Eastern region.

Although the lake's surface water and underground aquafers provide fresh water for wells and boreholes for the local inhabitants, people living around the lake lack access to safe drinking water and proper sanitation. This is primarily because as water quality deteriorates, saltwater intrusion degrades local wells, and water-related diseases inflict the people living in the region. The International IDEA (2000:268) has argued that access to safe drinking water, essential to human and animal survival, is very limited in the North-Eastern region. This lack of access to safe drinking water is responsible for the poor quality of life in the region because if affects people's health and productivity. The poor living condition will worsen in the event that the lake continues to shrink.

Secondly, the shrinking of the lake's water will pose the biggest single threat to food security, leading to the exacerbation of poverty in the region. Although there is pervasive poverty in Nigeria, available statistics in 2004 show that the existential condition of the vast majority of the inhabitants of the North-Eastern region is the lowest. While the prevalence of poverty (in percentages) in the South-South was 35.1; the South-East stood at 26.7; the South-West 43.0; that of North Central was 67.0; North-West was also high with 71.2; and North-East was the poorest with 72.2 (Soludo 2007:30). It has been noted that people around Lake Chad are among Africa's most chronically vulnerable to food insecurity. They deal with variability through mobility and through diversity of food sources (US Geological Survey 2007). Consequently, the poverty level in the North-Eastern region will be exacerbated in the near future as the shrinking of the lake contributes to crop failures, livestock deaths, collapse of fisheries, increased soil salinity, and significant disruption of economic livelihoods.

In addition to increased poverty, the diminution of Lake Chad will intensify the rate of migration and cross-border movement within the basin which will heighten resource and identity conflict in the North-Eastern region, and even beyond. Already, the shrinking of the lake has induced the influx of Udawa nomadic cattle herders from the Republic of Niger as well as the migration of citizens of Chad and of Nigerians further south in search of optimum opportunities. It has been noted that the long-distance migrants, usually referred to as Udawa, have been well-armed since the mid-1990s and are willing to use violence to assure their grazing (Blench 2004:iii).

Consequently, as areas dry up, farmers and cattle herders have had to move southward towards greener areas where they end up competing for the available scarce resources such as fresh water and arable/grazing lands with other economic groups or with host communities. This explains some of the conflicts between herders and farming communities reported in recent years in North-Eastern Nigeria. Some of the farmers forced to migrate from the Lake Chad area have gone to cities, as far as Lagos, where they take up menial jobs or swell the ranks of the jobless, adding to the social crises there (Science in Africa 2003). As water quantity diminishes or quality degrades over time, the net effect on the region will be unsettling: the frequency and intensity of conflicts within the region would escalate, leading to *ecomigration* and a mass of environmental refugees.

Recommendations

It is evident from the foregoing that further shrinking of the lake will create more problems for Nigeria in the near future. Therefore, there is the need for something drastic to be done to save the lake.

One way of mitigating the impact of this impending environmental disaster is for the political leadership in Nigeria to muster strong political will to jumpstart the replenishment project of the lake proposed by the

Lake Chad Basin Commission (LCBC). The Lake Chad Replenishment Project requires the damming of the Oubangui River at Palambo in the CAR and channelling some of its water through a navigable channel to Lake Chad, with the objective of rehabilitating the lake, rebuilding its ecosystem, reconstituting its biodiversity, and safeguarding it for present and future generations.

Although the political leadership in Nigeria has made commendable efforts in this regard, such as the provision of about 52% of the budget of the Regional Parliamentary Committee on Lake Chad, funding of a pre-implementation feasibility study and the organisation of international conferences and workshops aimed at finding a lasting solution to the shrinking lake, there is the need for stronger social and political networking with donor agencies, co-riparian states, community leaders and environmental NGOs to fast track the replenishment project.

More so, strengthening of an institutional framework, especially the LCBC, for regulating the exploitation of the resources of the basin is quite expedient. The signing of the LCBC convention, as far back as 1964, was a clear signal of the riparian countries' willingness to address issues relating to sustainable management of the lake and its catchment area. However, political, financial and logistical problems have significantly vitiated the effectiveness of the LCBC in regulating the use of the basin resources. It is significant to note that unilateral actions, political conflicts and micro-nationalist interests have prevented the riparian countries from cooperating as strongly as they should to strengthen the LCBC as the only viable supranational institution mandated to regulate the exploitation of the resources of the basin for their mutual benefits. The strengthening of the LCBC through greater political cooperation among riparian states, timely payment of annual subscription by member states, and vigorous implementation of capacity-building programmes for staff of the LCBC to enhance its effectiveness is another way of preventing the looming danger.

Finally, since the local communities are the primary beneficiaries and victims of the vagaries of Lake Chad, there is equally the need to integrate them in the management of the resources of the lake. This will enable them to play a strong role in articulating their needs in relation to their livelihood priorities as well as to work with local governments, environmental NGOs, the LCBC and donor agencies to achieve the overall objective of reviving and conserving the lake through sustainable exploitation. Although the priorities may vary from community to community, the bottom line should be adequate involvement or representation of the local people in the decision-making process. Such an initiative should explore means of harmonising the gap between government and local community interests. This is essential because governments' perception of the realities of the Lake Chad Basin is often times contrary to the local people's world view. Equally, attention should be focused on sensitisation, enlightenment and the training of local communities to protect both the shoreline of the lake and the adjacent areas as well as to create alternative means of generating energy to prevent wanton cutting of fire-wood by local inhabitants; an action that has greatly contributed to the desertification process. The integration of the local people and communities must go beyond the mere perception of them as stakeholders, but as key participants whose knowledge and participation are critically needed to ensure the success and sustainability of any project or policy designed to save the lake.

Conclusion

This paper traces the intricate linkages between environmental degradation, livelihoods and conflicts in the Lake Chad basin. It argues that environmental resource scarcity as a result of degradation often lead to disruption of immediate economic livelihoods, which interact with other social variables to produce conflicts in the basin. Based on the above findings, the paper concludes that if the diminution of the

Lake Chad is not halted, it poses serious security implications for Nigeria, and the North-Eastern region will be the hardest hit. To mitigate the impact, it advocates for greater political cooperation to save the drying lake, the strengthening of the supranational organisation to ensure sustainable regulation and exploitation of the resources of the lake, and the integration of the local communities in the management of the resources of the lake.

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