Chapter 5:
Climate change, human security and the humanitarian crisis in the Lake Chad Basin region: selected legal and developmental aspects with a special focus on water governance

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1 Introduction

Since independence from either the French or the English in the early 1960s, the countries of the Lake Chad Basin (LCB) region, with a longstanding history of violent conflict, have been plagued by serious humanitarian crises. This is inter alia due to complex political instability, weak economic and social policies, which have prolonged the national and international conflicts. Low levels of economic development vary between riparian nation states, poor education systems, widespread illiteracy, sharp gender disparities, high health risks, water and food insecurity are marks of the crisis-stricken region. The LCB area represents the poorest, most marginalised and neglected part of each respective country, with poor provision of basic infrastructure and social services; a situation that disfavours various aspects of human security. Nigeria has been hit by successive incidents of unrest, including *coup d'états*, civil wars and the recent rise of the Islamist extremist group Boko Haram, founded in 2002, that has terrorised the entire region. Chad has for a long time experienced a seemingly endless crisis of civil war since 1963. As an enclave country, it has often been exposed to threats of attacks, human trafficking and armed conflict from Libya, Darfur (South Sudan) and the Central African Republic. Being part of the route that migrants take to reach Europe, the Chadian desert supports the migrations of young people fleeing the unbearable situations of their origins. Niger, ranking second lowest in the world on the Human Development Index[1], suffers from continual structural calamities, weak sectoral policies and low levels of investment and development aid, as well as an influx of refugees from Mali and Nigeria. Meanwhile, Cameroon – despite its development deficits – has since 1967 borne the burden of huge refugee inflows from many neighbouring states. Following huge crop damage by locust swarms; the stagnation or decline of crop production, fishing and animal husbandry activities; the constant mobility of people; a sustained crime wave; and health, food and price insecurity despite

1 UNDP (2016). The Central African Republic ranks lowest in the world.

international and national efforts, research worldwide seeks a new understanding of the persistence of the humanitarian crises in the region.

Lake Chad is an international shallow fresh-water lake, which has receded significantly over the past decades due to overuse, poor management practices and expanding desertification. The LCB is located between Latitude 6° and 24° N and Longitude 7° and 24 E°. Covering 2,434,000 km^2, which is an estimated 8% of the total African surface area, the Basin is shared by the riparian countries of Chad (45%), Niger (28%), the Central African Republic (CAR) (9%), Nigeria (7%), Algeria (4%), Sudan (4%), Cameroon (2%) and Libya (0.5%).[2] However, only four of these are in direct contact with the lake, namely Cameroon, Chad, Niger and Nigeria.

Chad and Niger are the countries with the largest shared territory, but three-quarters of the lake water come from the CAR and Cameroon. More than 70 ethnic groups and a total population of about 38 million form the predominantly rural population around Lake Chad, most of which depend on the region's natural resources for their livelihoods.[3] The Human Development Indices (HDI) – a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living – in the region are among the lowest in the world.[4]

According to the United Nations, the long-running violence and military counter-offensives have affected 21 million people across the LCB and left nearly half of the region's population – 9.2 million people – in critical need of aid.[5] Chad, Niger and Nigeria have experienced periods of military rule. Chad and Nigerian politics are shaped by oil exploration. Transitions from military rule to democracy have occurred in Niger and Nigeria.[6] The LCB is conflict dense. Attacks have taken place in northern Cameroon since March 2014 and in southern Niger and western Chad since early 2015. Fighters move freely across national borders. They have some level of support from certain local populations in all four countries although there is also much anger directed against them due to continuing tactics of committing attacks against civilians.[7] Cameroon has seen a recent escalation of conflict and violence in its northeast and southwest regions, marked by violence against Anglophone activists by security forces,[8] bomb blasts and the proclamation of the independence of Ambazonia by secessionist groups.[9]

2 Odada et al. (2006: 1).
3 With further references see Nagarajan et al. (2018).
4 UNDP (2016); and Nett & Rüttinger (2016).
5 UNOCHA (2016).
6 Nagarajan et al. (2018: 9).
7 Ibid: 13.
8 Ruppel & Stell (2017).
9 ICG (2017).

In Chad, already hosting hundreds of thousands of refugees from conflicts in neighbouring Sudan and the CAR, clashes between settled farmers and nomads over land use rights and access to water occur frequently in the north. Niger, with a history of conflict between the state and some of its Tuareg communities, has also, due to its geographical location, felt the spill-over of conflict from neighbours Mali and Libya as well as Nigeria. New sites of conflict have manifested in Nigeria since its 2015 elections around the pro-secessionist mobilisation by and state reaction to the Indigenous Peoples of Biafra (IPOB) in the southeast and tensions around the killing of over 300 unarmed members of the Islamic Movement of Nigeria (IMN), a Shiite group, by the military, detention of their leader and protests ending in violence which add to pre-existing conflict around oil extraction in the Niger Delta, rural banditry and inter-communal violence.[10]

While the peoples of Niger and Chad are predominantly Muslim, Cameroon has a Christian majority with a significant Muslim minority and Nigeria roughly equal numbers of Christians and Muslims.[11] The role played by ethnic heterogeneity in local resource conflicts in the LCB region contributes to its population dynamics. The ethnic composition remains a crucial factor for mobilisation, turning the protest into collective violence triggered by language and religious loyalties. In trying to make a living through the exploitation of scarce water and land resources, the multi-ethnic groups have often engaged in interethnic and sectoral conflicts.[12] One particular instance is the recurrent deadly clashes between the Shuwa Arabs from the east of Lake Chad and the Fulani pastoralists from the south-west, over the limited fishing and animal husbandry opportunities at the southern pool of the Basin.[13]

As of 2016, over 30 million people inhabited the LCB.[14] This rapidly growing population – with an average growth rate of 2.6% – is ethnically highly heterogeneous, with over 70 groups who are Christian, Muslim and Animist by faith. The main groups are Kanuri, Maba, Buduma, Hausa, Kanembu, Kotoko, Bagger, Haddad, Kuri, Fulani, Massa, Mundang and Manga, and they often straddle the region's international borders, with the largest cities being Kano and Maiduguri in Nigeria, Maroua in Cameroon, N'Djamena in Chad and Diffa in Niger.[15]

10 Nagarajan et al. (2018: 17).
11 Ibid: 12.
12 Le Barbe & Lebel (1997).
13 Odada et al. (2006).
14 Cf. <https://www.gwp.org/en/WACDEP/IMPLEMENTATION/Where/Lake-Chad/> (accessed 18-5-2018).
15 Okpara et al. (2015: 2).

2 Diverse climate

The LCB region is located in the Sahel at the southernmost edge of the Sahara, but the lake itself is largely fed by precipitation further south in the humid tropics. This unique geography has created an oasis in an otherwise largely arid region. The LCB features strong diversity in climate, from the desert in the north to humid tropics in the south.[16] According to the Intergovernmental Panel on Climate Change (IPCC), the Sahel is the world's region with the most substantial and sustained decline in rainfall recorded, and climatic conditions are expected to deteriorate further.[17] Temperatures are projected to increase, and if the shrinking of Lake Chad continues at the current pace, the lake could completely disappear within the next 20 years.[18]

While the LCB region is generally and historically subjected to intense drought events, water scarcity is increasingly associated with the myriad of socio-economic and livelihood shifts around the lake, for which climate variability acts as an amplifier. Both overexploitation and climate change have the potential to contribute to increased conflicts over the distribution of natural resources.[19]

Depending on precipitation rates, which vary from an average of 1,400 mm/year in the south to 10 mm/year in the north, four climatic zones may be identified in the LCB, namely: the humid zone in the Basin's southern part (the territory of Cameroon and CAR); the dry sub-humid zone (the territory of CAR and Chad); the semi-arid zone in the central part of the Basin (the territory of Nigeria, Chad and Niger); and the northern arid and hyper-arid zone (territory of Niger and Chad). The northern half of the Basin is desert, containing the Tenere desert. Erg of Bilma and Djurab lying south of that comprises the Sahel zone, which is dry savanna and thorny shrub savanna. The main rivers are skirted by riparian forests, flooding savannas and wetland areas. In the far south, there are dry forests.[20]

Lake Chad constantly changes in response to variations in temperature and rainfall. A variety of ecological zones surround the lake, including deserts, forests, wetlands, savannas and mountains.[21] Three main drainage systems supply its water, namely the Chari-Logone River (in the CAR), the Komadugu-Yobe River (in Nigeria) and the Yedsaram/Ngadda River (in Cameroon). Lake Chad is, in fact, a tropical lake with associated wetlands. It has a northern and a southern basin of roughly the same size, which are separated by a sand barrier, referred to as the Great Barrier. It is very shallow with a general depth of less than four metres. The main rivers feeding the lake flow

16 Nagarajan et al. (2018).
17 Niang & Ruppel (2014: 1209).
18 See Nett & Rüttinger (2016: 13) with further references.
19 Niang & Ruppel (2014).
20 FAO (2009: 2).
21 Ovie & Emma (2011); Sullivan & Rohde (2002).

into its southern basin. When the water level is too low, the Great Barrier prevents water from flowing to the northern basin, causing that segment of the lake to dry up.[22]

3 Livelihood and sustainability

The LCB supports the human population, as well as millions of wildlife that include birds, mammals, reptiles and amphibians. There are populations of elephants, giraffes and lions. The local economy in the upper part of the catchment area is based on fishing, agriculture and pastoralism. Agriculture is primarily undertaken in rain-fed areas in the south and flooded areas. Hydrological and biophysical changes resulting from natural climatic variability and various human activities threaten the entire LCB, but the lake itself and the natural resources and ecosystem services are used by communities to pursue their livelihoods.[23]

Livelihoods are sustained by activities dear to the peoples' hearts. The main activities in the LCB are economic and include farming, herding and fishing, as mentioned earlier. At least 40% of the rural population of the Basin lives in poverty and routinely faces chronic food shortages.[24] Crop production based on rain is possible only in the southern belt, as highlighted earlier. Flood recession agriculture is practised around the LCB and in the riverine wetlands. Nomadic herders migrate with their animals into the grasslands of the northern part of the Basin for a few weeks during each short rainy season, where their livestock intensively graze the highly nutritious grasses. When the dry season starts, the herders move back south, either to grazing lands around the lakes and floodplains or the savannas further to the south. Livestock rearing is, in fact, most well developed in the northern section of the Basin,[25] while farming activities can be traced mostly on the edges of Lake Chad and in the south of the Basin.

All the LCB countries have alarming levels of hunger, with some witnessing extreme levels. The Global Hunger Index (GHI) is a multidimensional statistical tool that describes the state of hunger in different countries. The GHI value for Chad is over 30 and is between 20 and 29.9 for the other basin countries.[26] With poverty conspicuous throughout the Basin, many young people seek to flee the region or join armed groups leading to increased social unrest. It is expected that this will worsen in the coming years, as the security and economic situations have reached a critical point, demographic growth is large, and climate change is negatively affecting agriculture. Furthermore, with increasing environmental challenges, multi-activity has become common as individuals engage in several livelihood activities from fishing, livestock

22 McMichael et al. (2003).
23 UNEP (2004).
24 FAO (2017).
25 FAO (1983).
26 Cf. <http://www.globalhungerindex.org/pdf/en/2017.pdf> (accessed 18-5-2018).

rearing, agricultural, trading and handicraft making to secure revenue to sustain their livelihoods.[27]

4 Hydrological and biophysical changes

The LCB area has experienced serious hydrological and biophysical changes caused by climatic variability and various human activities. These threaten the entire LCB, the lake itself and the ecosystem and natural resources used by communities to pursue their livelihoods.[28] The depletion of soil fertility and freshwater supplies and the mismanagement of water catchment basins as a consequence of excessive deforestation have also contributed to encroachment by the Sahara Desert. The climatic changes have imposed on the region high temperatures, strong winds, high evapotranspiration (estimated at 2,200 mm/annum) and fluctuating rainfall patterns.[29] Annual rainfall varies spatially from nearly 1,400 mm along the southern pools to less than 150 mm near the northern end.[30] In fact, a short rainy season (June, July, August and September) and a longer dry spell are pronounced characteristics of spatial-temporal distribution of rainfall in the LCB.[31]

Because of the strategic location of the Basin, in a climatic transition zone, regions at the south of the lake tend to experience more rainfall than those at the north of the lake. The mean monthly rainfall for eight stations within the LCB area that are located in the southern parts of the Basin shows that distribution is common in tropical rainfall regions. Here, rainfall occurs from April to early November. The northern portion, however, only experiences (often very light) rainfall for a shorter period in July, August and September. What this means is that the level and size of Lake Chad depend on precipitation in the southern parts and how much of the run-off is transferred through the floodplains of the Basin to the lake.[32]

The distribution of surface water bodies has a high correlation with rainfall distribution. The southern parts have a few perennial rivers that act as lifelines to agricultural activities and human needs, while the north-east and north-west regions are characterised by intermittent water bodies that have low seasonal flow and dry up quickly at the onset of drought.[33]

Studies concerning mild and prolonged drought years in northern Cameroon show that the riverbeds of these intermittent streams are desiccated, primarily as a result of substantial water abstraction for irrigation and nomadic pasturing.[34]

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27 Mekonnen (2016).
28 Niang & Ruppel (2014); and UNEP (2004).
29 FAO (2009: 33).
30 Odada et al. (2006).
31 Coe & Foley (2001); Nicholson, Yin & Ba (2000); and Caminade & Terray (2010).
32 Charney (1975: 193-202).
33 Okonkwo & Demoz (2013).
34 Lienou et al. (2005).

The distribution of decadal monthly rainfall and temperatures suggests that there is a relationship between high temperature and low rainfall. Increased temperature leading to increased evapotranspiration is associated with increased drought.[35] Peak rainfall in August corresponds to the northward movement of the intertropical convergence zone (ITCZ).[36] Consequently, the history of drought in the Basin is defined by its changing rainfall patterns.[37]

From the middle of the 1960s, rainfall started to drop intermittently until the droughts of 1972-1975, which coincided with the shrinking of the Basin surface water level to 10,700 km^2 from its initial level of 25,000 km^2 in 1963.[38] Another drought, which occurred in 1982-1985, resulted in a drop in water levels in the LCB to 1,410 km^2,[39] the lowest basin surface level recorded over the past 100 years. This is evident in many river beds. Lake Chad was identified as one of the lakes at greatest risk of socio-political stress.[40] Over 13 years since this observation, the state of the lake's Basin has worsened in as much as it has shrunk by over 90% compared with its size (25,000 km^2) in the 1960s.[41] Lake Chad was vastly bigger (up to 400,000 km^2) several thousands of years ago than it was in the 1960s when it was known as Lake Megachad.[42] For the entire 20th century, the lake was at its highest level between 1960 and 1963.[43]

Furthermore, stream flow modification and water diversion, associated with the construction of large irrigation and water development projects along the Chari-Logone River and Kamadugu-Yobe River, are also identified as contributing to the shrinkage of the Basin over the period 1970-2013.[44] The construction (between 1979 and 1990) of the Yaguou-Tekele Dyke and Maga Dam beside the Chari-Logone River in Chad, and a series of other dams, such as the Alau Dam, Tiga Dam, and the Yeders Dam at the Nigerian end of the Kamadugu-Yobe River, has had a great impact on the lake's waters.[45] Between 1970 and 1990, the average water discharge from the Chari-Logone River to the Basin was 55% of the average of the period 1950 to 1970.[46]

It is estimated that about one-third of the water flow (since the 1980s) is diverted from the Chari-Logone River in the CAR before it reaches the LCB.[47] Water diversion

35 Dai et al. (2004).
36 Lélé & Lamb (2010).
37 Malo & Nicholson (1990).
38 Okpara et al. (2015: 7).
39 GIWA (2004).
40 Wolf et al. (2003).
41 Gao et al. (2011).
42 Drake & Bristow (2006).
43 USGS (2014).
44 Ibid.
45 Onuoha (2008).
46 Olivry et al. (1996).
47 Glantz (2004).

for irrigation and hydropower generation increased greatly between 1981 and 1990.[48] About 50% of the depletion in the lake's size since the late 1970s to 2000 was attributed to unsustainable water diversion and use for human activities, but recently arguments attributing water shortage to evaporation due to global warming are growing more popular.[49]

Consequently, the current state of the lake is one of acute water shortage. In 2000, the water supply was less than 500 m^3 per person per year.[50] This has not changed to date though the population has continued to increase. A change from cultivation of low water intensity food crops (such as wheat) to high water intensity food crops (such as rice) has added to water scarcity.[51]

Reduced water levels have caused increased alkalinity, increased anoxic conditions and worsened the effects of eutrophication.[52] Because the lake region is generally and historically subjected to intense drought events, water scarcity is increasingly associated with the myriad of socio-economic and livelihood shifts around the lake, for which climate variability acts as an amplifier. This has had a direct effect on food yields and famine in the area.

Relying on ecosystem health, subsistence farmers, fisherfolk and pastoralists suffer from accentuated unpredictability and relative decline in rainfall levels. In this dry region, even a one-degree global temperature rise contributes significantly to the decline of the lake, which equates to the destruction of people's vital resources and livelihoods. Accordingly, drastic consequences of global climate change fall on those whose activities have contributed the least emissions. With desertification erasing some fishing areas over time, shrinking the lake to reveal more land for cultivation, combined with the reduction of fish stocks from overfishing and as a consequence of the lake's recession, many fishermen have given up fishing to begin farming.

Household groups have switched livelihood strategies as the demand for water and water scarcity have simultaneously increased. These chain reactions have often heightened competition between farmers and other livelihoods. Impacts on income, food and nutrition security, labour generation and poverty alleviation are clear as climate-related water stress, and shortages exacerbate community vulnerabilities. Relying on increasingly exhaustive coping strategies and social networks to meet food security needs, people have moved around the Basin and diversified livelihood activities and adopted more drastic behaviours. As a result, the resilience of the socio-ecological system of the region is threatened as resources become more intensely used and depleted.

Reduced rainfall and streamflow modification reduce fishing grounds and modify habitats, which translate to declining fish catch and trade, lowered income,

48 GIWA (2004).
49 Coe & Foley (2001).
50 Henninger et al. (2000).
51 Odada et al. (2006).
52 Ovie & Emma (2011).

unemployment and increased poverty, and, ultimately, food and nutrition insecurity. For 40 years the only water in the lake has been found at its deepest point, namely the southern pool and to a certain extent in the marshes, in spite of high flow rates occurring elsewhere. The relative flatness of the terrain means that variations of a few centimetres flood the islands, as happened in 2012, or result in the lake shoreline receding by several kilometres. Such variations have not, however, been beneficial to fish reproduction, forcing fishermen to diversify their activities and move into farming, owing to the uncertainty and insecurity caused by the varying water levels of the lake.[53] The species of fish currently caught by fishermen, although once plentiful and varied, are struggling to survive the onslaught of overfishing and the drop in water levels caused by the variable climate. The reduced water levels have not only led to decreased fish catches but have also increased the productive capital expenditure of fishers, especially for hitherto near-shore fishers. Changes in fish distributions and productivity not only increase productive capital considerably but also inflate the cost of fish.

In the same vein, the lake's fishing communities have had to move in response to declining fishing grounds caused by a gradual but steady decline in water area.[54] Furthermore, the siltation of water bodies and watercourses, the proliferation of invasive aquatic plants, premature dewatering, the reduced biodiversity, increasing water pollution, and harmful fishing practices have not helped the fishing environment, as there has been a serious decline in fish production over several decades and the disappearance of once-common species. This has also affected the livestock herders and pastoralists. Livelihood patterns have shifted in large part owing to growing water shortages in the Basin. For example, decreased grazing land for animals has led herders to shift from rearing grazing animals (cattle and camels) to browsing animals (sheep and goats),[55] which has led to an increased removal of vegetation cover.[56] Moreover, water shortage has initiated shifts in livelihood patterns.[57] This, in turn, has led to increased removal of vegetation cover.[58] A declining annual fish catch (for example, the annual fish catch from the lake's fisheries decreased from 141,000 tonnes in the early 1970s to 70,000 tonnes in 2002) explains that fishers engaged in small-scale open water fisheries have had to switch to swamp and floodplain fisheries.[59] This required a change in fishing gear, from open water gear to specialised passive gears such as gill nets, cane traps and hooks. Because of reduced fishing areas, large-scale fishers have had to invest in bigger and safer boats to enable them to travel longer distances to access the

53 Cf. <http://www.cblt.org/sites/default/files/download_documents/report_on_the_state_of_the_lake_chad_basin_ecosystem.pdf> (accessed 18-5-2018).
54 Ovie & Emma (2011).
55 Onuoha (2008).
56 USGS (2014); and Herrmann et al. (2005: 394).
57 Living Waters (2003).
58 USGS (2014).
59 Cf. <http://www.cblt.org/sites/default/files/download_documents/report_on_the_state_of_the_lake_chad_basin_ecosystem.pdf> (accessed 18-5-2018).

open waters of the lake to catch species of higher value, as indicated earlier. Only the wealthy fishing households can make these adjustments, while the poor become poorer and remain more exposed to the exploits of terrorists in the region.[60]

5 Human security, conflict and migration

Adverse climatic events not only deepen poverty vulnerability but also have an impact on all aspects of human security, either directly or indirectly. Issues that potentially interrelate between climate change and human security include water stress, land use, food security, health security, environmentally induced migration and violent conflict.[61] Both overexploitation and climate change will continue to contribute to increased conflicts over the distribution of natural resources.[62]

Although violent conflict and migration are caused by different interacting factors, including social, demographic and economic drivers, it may be observed that migration and violent conflict in the LCB are also sensitive to the impacts of climate change. In fact, climate change has the potential to act as a risk multiplier threatening the stability of states and societies.[63] Examples of climate change impacts closely related to migration are floods and droughts exacerbated by climate change, which have resulted in an increased rural-urban migration. The nexus between climate change and violent conflict on the African continent has become the focus of a growing body of research in recent years. Mechanisms linking climate change to violent conflict include worsening livelihood conditions; migration and changing pastoral mobility patterns; tactical considerations of armed groups; and exploitation of local grievances by the elite.[64]

Extreme weather events can be a cause of violent conflict as they have the potential to intensify competition over scarce resources, especially in regions that lack efficient conflict management institutions. As droughts and expansion of the Sahel continues, southward migration has increased since people move south to seek basic resources for their survival and that of their livestock. This southward migratory trend, however, has not curbed natural resource degradation due to overexploitation.[65]

One major concern regarding human security is the issue of forced migration in fragile contexts. In recent years the number of forcefully displaced persons has increased significantly and caused a number of short-term human security needs, as well

60 Ovie & Emma (2011).
61 Ruppel (2013).
62 Niang & Ruppel (2014).
63 Rüttinger et al. (2015).
64 SIPRI (2017).
65 GIWA (2004).

as long-term challenges, including dealing with the legal status of displaced persons in a host country.[66]

Most forcefully displaced persons are internally displaced, namely displaced within the borders of their home country; and forced displacements are closely associated with violent conflicts. Official data differs in tracking ongoing migrations and displacements, as such numbers are mostly approximations of forced migration, unable to qualify the chaos of daily life within the Basin, which has lost many types of security. Capturing the threats within LCB, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) reported that as of 30 March 2016, beyond those taking refuge outside their home countries, the number of internally displaced people had surged. According to the International Organization for Migration (IOM) in 2017, displaced people were recorded in the following countries: Nigeria (3 million), Niger (252,000), Cameroon (396,000) and Chad (176,000). In total, 17,300,000 people are living in the affected area of which 2,200,000 are internally displaced people and 1,400,000 returnees.[67]

Added to this, are the death tolls, destruction of schools and hospitals, and the blocking of food supplies, market holdings, trans-border transactions and so on, in the region. Moreover, the relationship between climate change and armed conflict has an amplifying effect on the subsequent humanitarian and hunger crises in the region.

Community assets and food reserves are destroyed as Boko Haram strikes, which worsens already severe problems of food security and increases the prevalence of acute malnutrition in the region. Within a previously poor nutritional situation, due largely to food shortages resulting from environmental challenges, the incidence of conflict and regional insecurity (beyond pre-existing drought and desertification disasters, which steadily damage natural capital) appear as overlaying causes and effects of the regional crisis. Hence, the protracted conflict-induced humanitarian situation appears as a prolonged shock to a regional system already dealing with local food and nutrition insecurity for decades. Therefore, interruptions to daily life and routine coping strategies employed within areas of poor economic and low human development have compounded impacts, drastically affecting people throughout the region in one way or another and reducing their already constricted strategies for coping in a harsh environment. In many cases people have been uprooted from their homes, thereby losing social and physical capital, and, in other cases, have been compelled to drastically alter their networks, activities and previous sources of income.

According to recent reports from the Nigerian military, Boko Haram has resorted to using natural resources as a weapon and part of their strategy of violence. They have poisoned water sources such as wells and streams in areas where they were dislodged by state troops, making water use dangerous for both humans and livestock. While it

66 SIPRI (2017).
67 IOM (2017).

remains unclear whether this strategy is being systematically used as a weapon against civilians, it underlines the strategic importance of natural resources in the conflict.[68]

Ultimately, the causes for displacement and migration are manifold; however, climate change in the LCB region is definitely one of the interlinking issues. Other potential drivers of migration are push and pull factors related to the overall situation in the LCB region, and intervening factors that facilitate or restrict migration, all of which interact in different ways.[69] However, human mobility is a strategy (not only a reaction) to climatic changes that is characteristic of the LCB region, and the nature of the response is determined by the economic context of the specific communities.[70] For instance, family and kinship groups straddle national borders, and historically, people have migrated and traded freely across the region. There was always thriving cross-border trade in agricultural produce, fish as well as other goods and commodities. Lake Chad acted as a trading hub offering economic opportunities and resources of which people living around the lake took advantage despite the lack of national government policies to support this.[71]

6 Water scarcity and regional security

The importance of Lake Chad's transboundary waters creates a situation where conditions in one country can create adverse repercussions in another. A river basin is a source of ecological interdependence under which water stress and conflicts in one country can be transmitted to another.[72] This has regional security implications.

Research shows that when there were increased water crises in the region during the droughts of the 1980s and 1990s, people struggled for the scarce fertile areas and wetlands.[73] This crisis phenomenon has become the order of the day in the region since then. For instance, several militarised conflicts occurred over competing river claims, especially as resource users migrated in response to the shrinking lake. For example, between 1980 and 1994, almost 60,000 Nigerians followed the receding lake waters, fishing, cultivating crops and rearing animals within Cameroon's border of the LCB.[74]

By triggering hostilities with neighbours and damaging relationships between nations sharing the lake's common pool resources, the shrinking lake threatens regional security. In 1982 local people from Cameroon and Nigeria clashed over access to the

68 See Nett & Rüttinger (2016: 14-18) with further references.
69 Black et al. (2011).
70 Niang & Ruppel (2014).
71 Nagarajan et al. (2018: 10).
72 Tir & Stinnett (2012).
73 Hall (2009).
74 Ibid.

water resources around the southern end of the LCB.[75] In 1983, Chad engaged in a violent interstate conflict with Nigeria over the status of the islands in the lake with which both countries have borders.[76] This violence resulted in over 100 casualties.[77]

In the late 1980s, Nigeria and the Niger Republic clashed over water diversion and access to the Komadugu-Yobe River flow within the LCB. In 1992, there were clashes between upstream (Nigeria) and downstream (Niger) communities over access to the waters from the Tiga and Challawa Gorge Dams at the south-western end of Lake Chad.[78] All of these conflicts also increased the number of displaced people in the region.

With climate change causing reduced rainfall, reduced river runoff and more frequent droughts, the extent and impacts of water scarcity are far-reaching, particularly in the context of livelihood security. Thus, a collaborative stand exists between climate change, water scarcity, conflict and migration. Since 2005, competition and conflict over the use of water resources within the lake have continued to create security concerns at the lake's southern pool where the largest population of resource users live.[79] Water shortages and loss of livelihood options have driven vulnerable people into risky behaviours such as drug trafficking and the trading of arms. Large cohorts of young people deprived of their sources of livelihood constitute the major portion of terrorist groups and rebels in third world militias.[80] The rise of violent jihadist militants, who have killed over 10,000 people in the southern part of the lake, has been linked to loss of livelihoods and joblessness created by environmental degradation around the lake.[81] As water scarcity and poverty become more amplified and intense, the economic and political value that communities and nations place on the lake's resources are expected to increase.[82]

Growth in unilateral consumption and unregulated allocation and use of water (for instance through damming, diverting, dumping and draining activities) by one nation decreases the amount available to another state. In the wake of the droughts and water shortages of the 1980s, each riparian country unilaterally took decisions to construct dams and divert water away from the lake without recourse to existing water agreements and consultations with the Lake Chad Basin Commission (LCBC). This implied that previously agreed-upon river diversion arrangements (e.g. for agriculture, human consumption and industrial use) became politically problematic as the water levels of

75 Odada et al. (2006).
76 UCDP (2008).
77 Wallensteen & Margareta (1999).
78 Odada et al. (2006).
79 GIWA (2004).
80 Ohlsson (2003).
81 Ifabiyi (2013).
82 Onuoha (2008).

rivers flowing into the Basin continued to drop and as the resulting externalities became a burden for downstream countries.[83]

Water resources comprise less than 1,000 m^3/person/annum, and, as in the case of the LCB, water scarcity creates discontent and desperation, especially when it constrains socio-economic development.[84] Since the droughts of the 1970s and 1980s, agricultural production has continued to decline. For example, annual sorghum yield was less than 250,000 tonnes during the 1972 to 1975 droughts and 180,000 tonnes during the 1982-1985 droughts.[85] These yields have further declined to date.[86] The retreat of the lake resulting from a series of relatively dry years has created new areas of cultivable land, which has proven beneficial to local farmers. However, these farmers are particularly affected by seasonal variability, as the receding water levels affect their harvests and the quality of their products with related effects, like food shortages, malnutrition, high market prices and high levels of poverty and hunger.

It is also noticeable that, owing to diminishing rainfall, resources have been depleted and desertification has advanced in the region. Productive activities, including agriculture, fishing, livestock rearing and the trade of the respective products, have also been interrupted by Boko Haram's insurgency and systemic violence via methods such as poisoning of water resources, and also "pillaging of villages, destruction of public buildings, systematic abduction, imprisonment, rape and forced marriages of girls and women, and forced recruitment or execution of boys and men".[87] Where the locals can no longer sustain a living from their environment, looking elsewhere for survival becomes a better option. That better option was found with Boko Haram who offered the poverty-stricken population opportunities for a livelihood. When the youths' livelihood activities or bread-winning actions are cut off or reduced in the region, the only means of surviving hardship was to acquiesce to the attractive offers.[88]

7 Water governance

Effective water governance is essential for human security. This – in the context of climate change – also needs to take adaptation opportunities into account.[89] Water action, peace action and climate action need to move closer together to engender social stability in the transboundary lake region.[90] Conflicts about water in the LCB are

83 Odada et al. (2006).
84 Gleick (2000).
85 GIWA (2004).
86 USGS (2016).
87 Nett & Rüttinger (2016).
88 BIR (2015); Funteh (2015); and Mercy Corps (2016).
89 Babcicky (2013).
90 Gustafsson (2016).

interlinked issues regarding their environmental, vulnerability and security implications. In fact, the need to harmonise and drive actions on resource management and governance was already recognised in the mid-1960s following the adoption of the Fort Lamy Convention, which led to the establishment of the LCBC.[91]

7.1 The Fort Lamy Convention

The political basis for international boundary settlement between the LCB countries was provided by a formal declaration at the Fort Lamy Conference of heads of government in December 1962, where all riparian states agreed to recognise the existing national boundaries of the lake and by the subsequent solemn resolution of the Organisation of African Unity in July 1964 that its member states undertake to respect the frontiers existing at the time when they became independent.[92]

From the *uti possidetis* rule follows a need for careful documentary research to determine the historical origins and current validity of the water boundaries agreed upon between the then colonial powers in the LCB, namely, Great Britain, France, and (until 1919) Germany.[93] After the First World War and the defeat of Germany, former German territories fell to the League of Nations in 1919.[94] According to Article 118 of the Treaty of Versailles, Germany had to renounce its rights over its former colonial territories:

> In territory outside her European frontiers as fixed by the present Treaty, Germany renounces all rights, titles and privileges whatever in or over territory which belonged to her or to her allies, and all rights, titles and privileges whatever their origin which she held as against the Allied and Associated Powers. Germany hereby undertakes to recognise and to conform to the measures which may be taken now or in the future by the Principal Allied and Associated Powers, in agreement where necessary with third Powers, in order to carry the above stipulation into effect.

After the liberalisation of Africa from colonialism, African leaders chose to keep colonial boundaries for the interest of stability and certainty by utilising the *uti possidetis* principle. Since 1964, the water resources of Lake Chad have largely been regulated by the Lake Chad Basin Commission Convention and Statute signed on 22 May 1964 in Fort Lamy (today named N'Djamena).[95]

The Fort Lamy Convention, an instrument of public international law, attempts to balance the conflicting interests of member states. On the one hand, it prohibits any unilateral exploitation of Lake Chad's water by its member states, whereas, on the other hand, it recognises their sovereign rights over the water resources in the basin.

91 Sand (1974: 68).
92 Ibid.
93 For further references to the relevant colonial treaties see Sand (1974: 68).
94 Regarding former Namibian and Cameroonian German territories, see for further information Ruppel & Ruppel-Schlichting (2016 and 2018).
95 Jacobs & Mostert (2007: 15).

These opposite aims are difficult to reconcile and contribute to disputes as history has shown.[96]

Generally, the Fort Lamy Convention permits its member states to exploit the resources of the LCB and to utilise the surface and underground waters. The Convention acknowledges the right of member states to plan water-related projects if they consult the LCBC beforehand. While the Convention mainly deals with matters of diplomatic form and procedure, the Statute details the functions of the LCBC,[97] and certain principles of substance, including the basic compromise formula of Article 5 which requires member states to consult with the LCBC before undertaking new projects likely to have an appreciable effect on the overall water balance or water quality of the basin.[98]

Article 5 is the cornerstone provision of the Fort Lamy Convention, which establishes the principle of prior consultation between member states before they initiate measures likely to have marked influence on water quantity or quality, including groundwater reserves. It provides as follows:

> The Member States undertake a refrain from adopting, without referring to the Commission beforehand, any measures likely to exert a marked influence either upon the extent of water losses, or upon the form of the annual hydro graph and limnograph and certain other characteristics of the Lake, upon the conditions of their exploitation by other bordering States, upon the sanitary condition of the water resources or upon the biological characteristics of the fauna and the flora of the Basin.
>
> In particular, the Member States agree not to undertake in that part of the Basin falling within their jurisdiction any work in connection with the development of water resources or the soil likely to have a marked influence upon the system of the water courses and levels of the Basin without adequate notice and prior consultations with the Commission, provided always that the Member States shall retain the liberty of completing any plans and schemes in the course of execution or such plans and schemes as may be initiated over a period of 3 years to run from the signature of the present Convention.

Article 5(2) can be seen as the environmental regulatory arm of the Fort Lamy Convention. It uses, but does not define, the term 'marked influence'. In accordance with the object and purpose of the Fort Lamy Convention, the term should be understood as meaning a measurable and not totally negligible impact on the ecosystem of the basin and the interest of other riparian States.[99]

Regarding navigation on Lake Chad and its tributaries, Article 7 of the Fort Lamy Convention provides that the member states "shall draw up common rules to facilitate as far as possible navigation…on the lake and its surrounding navigable waterways", whereas Article 3 provides that the basin is to be open to use of all member states, without prejudice to the sovereign rights of each, and subject to the establishment of

96 Lorenzmeier (2013).
97 The legal texts are available online at <http://www.fao.org/docrep/w7414b/w7414b05.htm> (accessed 6-6-2018).
98 Sand (1974).
99 Ibid.

common rules for the purpose of facilitating navigation on the lake and navigable waters in the basin. Read in conjunction, the provisions prescribe that navigation on Lake Chad still falls under the control of riparian states, which is only regulated by international norms. Article 7 of the Fort Lamy Convention treats the LCB as being of common interest to the riparian states and not as common property.[100]

As the shrinking of the water reserves of the LCB shows, the approaches to resource management in the Lake Chad region have been inadequate. Additionally, droughts, population increase and movement, as well as civil strife are common in the region and have placed constraints on the effective management of transboundary water resources in the area. In order to achieve the aim of sound biodiversity conservation and development in the region, an improvement and strengthening of the rules on environmental protection and their implementation is necessary.[101] Altogether, the "loopholes in the Fort Lamy Convention have long been recognised", and the implementation of the Fort Lamy Convention has had limited success when it comes to the shrinking of the water reserves of Lake Chad.[102]

7.2 The Lake Chad Basin Commission (LCBC)

The LCBC was established on 22 May 1964 by the four countries that border Lake Chad: Cameroon, Niger, Nigeria and Chad. The CAR joined the organisation in 1996 and Libya was admitted in 2008. Observer status is held by Sudan, Egypt, the Republic of Congo and the Democratic Republic of Congo. N'Djamena, the capital of Chad, hosts the Headquarters of the Commission.[103]

Chapter IV of the Statutes of the Fort Lamy Convention regulates the LCBC, which in terms of Article 17 shall, in all respects, enjoy the status of an international body. According to Article 9, the LCBC has the following terms of reference:

(a) Preparing joint rules, permitting the complete application of the principles affirmed under the present Statutes and the Convention to which it is appended, and ensuring an effective implementation of such rules;

(b) Assembling, examining and diffusing information on the projects prepared by Member States and recommending the planning of joint works and research programmes within the Chad Basin;

(c) Maintaining liaison between the Member States with a view to the most efficient utilisation of the waters of the Basin;

(d) Following up the execution of works and studies in the Chad Basin falling within the present Convention and keeping Member States informed at least once a year through the exploitation of systematic periodic reports which each State undertakes to address to it;

100 Lorenzmeier (2013: 3).
101 Ibid.
102 Aginam (2008: 206).
103 See <http://www.cblt.org/en/lake-chad-basin-commission> (accessed 18-5-2018).

(e) Formulating common rules concerning navigation;

(f) Establishing regulations governing its personnel and ensuring their application;

(g) Examining complaints and assisting in settling disputes;

(h) Supervising the implementation of the provisions of the present Statutes and the Convention to which it is appended.

Article 11 stipulates that the joint regulations and recommendations of the LCBC shall be transmitted to the governments of the member states for their decision. The mandate of the LCBC is to sustainably and equitably manage Lake Chad and other shared water resources of the LCB, to preserve the ecosystems of the LCB, and to promote regional integration, peace and security across the Basin. Promoting international cooperation between the riparian countries in the LCB is the main task of the LCBC. Moreover, the LCBC has a mandate for examining complaints and promoting the settlement of disputes between the parties. It also serves as a general forum for the riparian states on other issues like environmental protection. The work of the LCBC has to be seen in the light of the difficulties the region is facing, its weak powers, and its serious lack of financing. On the positive side, the work of the LCBC contributes to the peaceful settlement of disputes in the region, and as an international body, it is a perfect tool for the harmonisation of conflicting national objectives.[104]

Most importantly, the LCBC is in charge of managing all surface and groundwater resources in the LCB, including aquifers. It is the role of the LCBC to ensure the most efficient use of the Basin's waters. This requires regional (as opposed to national) development, coordination and implementation of measures that provide integrated management mechanisms. Such orchestration of both national and regional activities in the LCB water governance system would ideally also be prepared to mitigate the causes and adapt to the effects of climate change at regional, national and local levels. More recent approaches to water governance and resource management in the LCB region have led to the adoption of the Water Charter for the LCB[105] in 2012 with the aim of facilitating the implementation of the Lake Chad Vision 2025[106] and the Strategic Action Programme for the LCB of 2008.[107]

104 Lorenzmeier (2013).

105 See <https://www.africanwaterfacility.org/fileadmin/uploads/awf/Projects/MULTIN-LAKE CHAD-Water-Charter.pdf> (accessed 12-7-2018).

106 See <https://www.cblt.org/sites/default/files/vision_2025_en.pdf> (accessed 5-6-2018).

107 Cf. <https://iwlearn.net/resolveuid/2cc8f6b24b896184e77164ab75cbf7b1> (accessed 5-6-2018).

7.3 The Water Charter for the Lake Chad Basin

The creation of the Water Charter for the LCB[108] is a response to the fact that precipitation and hydraulic flow conditions in the tributaries of Lake Chad are extremely variable and are likely to be affected by climate change; and that an uncontrolled increase in abstractions could cause significant effects and critically reduce the volume and surface area of the lake as groundwater resources are inadequately managed, and the basin's ecosystems are very sensitive to variations in inflows and pollutant discharge. The risk of the lake drying up, the unavailability of sufficient good quality water resources, the disappearance of animal and plant species, widespread poverty, and risks of inter-community and interstate conflict within the Basin prompt the need for more effective measures to strengthen the legal and institutional framework for the sustainable management of the Basin's environment.

The parties to the Water Charter (Cameroon, CAR, Libya, Niger, Nigeria and Chad) commit themselves toward the following international instruments:

- the United Nations Organisation of 26 June 1945;
- the Constitutive Act of the African Union of 11 July 2000;
- the Revised Treaty of the Community of West African States (ECOWAS) signed on 24 July 1993;
- the Treaty Establishing the Economic Community of Central African States (ECCAS) signed on 18 October 1983;
- the Treaty Establishing the Arab Maghreb Union (AMU) signed on 17 February 1989; and
- the Lake Chad Basin Commission Convention and Statute signed on 22 May 1964 in Fort Lamy.

Moreover, the parties recognise the importance of the provisions made by non-binding international instruments and fundamental principles on international watercourses and lakes, in particular:

- the 1966 Helsinki Rules on the Use of International Watercourses, adopted in Helsinki in 1966;
- the United Nations Resolution 34/186 of 1979 establishing principles for conduct to ensure the conservation and harmonious use of shared natural resources, adopted in New York in 1979;
- the Declaration of the International Conference of Water and the Environment on sustainable development, adopted in Dublin in 1992;
- the 1992 Declaration of the United Nations Conference on the Environment and Development and the Action Plan of the United Nations Conference on the Environment and Development, in particular, Chapter 18 on the protection

108 Document available at <https://www.africanwaterfacility.org/fileadmin/uploads/awf/Projects/MULTIN-LAKECHAD-Water-Charter.pdf> (accessed 5-6-2018).

of freshwater resources and their quality, adopted in Rio de Janeiro in 1992;
- the Declaration of the International Conference of Water and Sustainable Development held in Paris in 1998;
- the Millennium Declaration including the Millennium Development Goals adopted in New York in 2000; and the
- the Ministerial Declaration of the International Conference on Fresh Water held in Bonn in December 2001.

The Water Charter also refers to binding international agreements to codified law on international watercourses and waterbodies and its gradual development, inter alia:
- the African Convention on the Conservation of Nature and Natural Resources dated 16 September 1968, amended on 11 July 2003 in Maputo;
- the Convention on Wetlands of International Importance especially as Waterfowl Habitat, dated 2 February 1971;
- the Convention on the Protection and Use of Transboundary Watercourses and International Lakes, adopted on 17 March 1992; and
- the Convention on the Law of Non-Navigational Uses of International Watercourses, adopted on 21 May 1997.

The major aims of the Water Charter are to regulate the following issues:
- quantitative management of surface and groundwater resources;
- protection and preservation of water quality in the basin's aquatic ecosystems;
- emergency planning and preparedness to ensure the protection of people, the environment and water resources;
- ban on significant harm to others;
- water-borne disease;
- navigation;
- prior notification of planned measures;
- enforcement of environment, water, fishing and navigation rights and regulations;
- collection and exchange of data and information;
- common facilities, facilities of common interest and infrastructure asset management and ownership;
- rights of the basin populations;
- promotional actions;
- implementation of the charter;
- settlement of disputes;
- partnership; and
- financing.

According of Article 1 of the Water Charter, Lake Chad and the watercourses, aquifers and aquatic ecosystems contained in its hydrographic basin, are declared international waters. They are common heritage belonging to the member states of the LCBC. It

further provides that member states shall cooperate to achieve the sustainable management and development of Lake Chad in compliance with the rules and principles governing international lakes and watercourses.

In Article 3, the Water Charter stipulates that it constitutes a binding framework the global purpose of which is the sustainable development of the LCB through integrated, equitable, coordinated management of the Basin's shared water resources and environment. It also promotes good governance, sub-regional cooperation and solidarity based on the common interests of member states as key ideals. The Water Charter falls under the framework set by the Fort Lamy Convention for the creation of the LCBC, and the Statute of the Commission signed on 22 May 1964 at Fort Lamy, which it refines and supplements.[109] This is important to note when it comes to the conflict of laws, as the Fort Lamy Convention can be regarded as *lex generalis* and the Water Charter is *lex specialis* to the Convention.

The Water Charter urges member states to use the LCB's surface water and aquifers in their respective national jurisdictions equitably and reasonably to obtain optimal, sustainable benefits that are compatible with the legitimate interests of all the countries in the Basin and with the protection of Lake Chad and the watercourses, aquifers and aquatic ecosystems contained in its hydrographic basin.[110] In the event of natural disasters or disasters caused by human activities affecting Lake Chad or these watercourses, aquifers and aquatic ecosystems, member states are obliged to immediately notify all other Basin countries and the LCBC, thereby allowing them to proceed as necessary to prevent or reduce the effects of the emergency situation on their national territories.[111]

Interestingly, the Water Charter acknowledges that citizens of member states have a right to water and sanitation, which is a fundamental human right and is necessary for human dignity.[112] Member states are obliged to take all normative, institutional and operational measures necessary to guarantee that this right is effectively implemented.[113] Moreover, member states are required to make all necessary internal arrangements, in particular judicial, institutional, operational and financial arrangements, to ensure effective enforcement of the Water Charter.[114]

Where disputes arise from the application or interpretation of the present Water Charter, member states are urged to settle these in a peaceful manner and in accordance with the United Nations Charter, the Constitutive Act of the African Union and the Declaration on Principles of International Law concerning Friendly Relations and

109 Article 6.
110 Article 10.
111 Article 37.
112 Article 72.
113 Ibid.
114 Article 83.

Cooperation among States.[115] Member states are required to seek solutions to their dispute employing direct negotiation,[116] and only if they fail to come to an agreement after negotiation, bring the dispute to the Commission for attempted settlement by way of mediation.[117] If the Commission is unable to settle the dispute, any party to the dispute may bring the matter before the competent regional and sub-regional authorities, which shall, in turn, seek to mediate the dispute.[118] If all the aforementioned dispute resolution mechanisms fail, the disputing parties must bring the case for arbitration or judicial dispute resolution before the International Court of Justice.[119]

7.4 Other relevant international and regional instruments

There are several other important international and regional instruments of key relevance to water governance in the LCB. These are briefly outlined below.

On 25 September 2015, the United Nations General Assembly adopted Resolution 70/1 (Transforming Our World: The 2030 Agenda for Sustainable Development)[120] containing 17 sustainable development goals (SDGs) and targets aimed at ending poverty, protecting the planet and ensuring prosperity for all. Each goal has specific targets to be achieved over the next 15 years. For the goals to be reached, everyone needs to do their part including governments, the private sector and civil society. The 2030 Agenda for Sustainable Development is guided by the purposes and principles of the Charter of the United Nations, including full respect for international law. It is also relevant in the context of the implementation of the LCB Water Charter, and the following goals are particularly relevant for the LCB:

- Goal 1: End poverty in all its forms everywhere;
- Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture;
- Goal 3: Ensure healthy lives and promote well-being for all at all ages;
- Goal 6: Ensure availability and sustainable management of water and sanitation for all;
- Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all;
- Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;

115 Article 85.
116 Article 86.
117 Article 87.
118 Article 88.
119 Article 89.
120 UNGA Res 70/1 'Transforming our World: The 2030 Agenda for Sustainable Development' (21 October 2015 UN Doc A/RES/70/1).

- Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation;
- Goal 10: Reduce inequality within and among countries;
- Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable;
- Goal 12: Ensure sustainable consumption and production patterns;
- Goal 13: Take urgent action to combat climate change and its impacts;
- Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss;
- Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels; and
- Goal 17: Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development.

People residing in and around the LCB also need to be protected in terms Article 22 of the African Charter on Human and Peoples' Rights (1986), especially when it comes to the alleviation of poverty. Article 1 of the African Charter compels states to "adopt legislative or other measures to give effect" to the rights protected under the African Charter. Article 22 further stipulates that all people "have the right to their economic, social and cultural development with due regard to their freedom and identity and in the equal enjoyment of the common heritage of mankind" and that states have a duty, individually or collectively, "to ensure the exercise of the right to development". Finally, Article 24 of the African Charter prescribes that all people "shall have the right to a general satisfactory environment favourable to their development".

Similarly, the LCB Water Charter is also subject to various Regional Economic Communities' (RECs) regulatory regimes, such as the Central African Economic and Monetary Community (CEMAC) and the Economic Community of Central African States (ECCAS). CEMAC is composed of six central African states, namely: Cameroon, Republic of the Congo, Gabon, Equatorial Guinea, CAR and Chad. Its main mission is to promote peace and the harmonious development of its member states by establishing an economic union and a monetary union. The CEMAC countries are founder members of the African Union (AU), successor to the Organization of African Unity (OAU). However, all the CEMAC countries also belong to the ECCAS. In addition to the CEMAC countries, ECCAS includes Burundi and the Democratic Republic of the Congo (members of the Economic Community of the Great Lakes Countries), as well as Angola and Sao Tomé and Principe. ECCAS is one of the eight Regional Economic Communities (RECs) designated by the African Union as pillars for the implementation of the African Economic Community. At the ECCAS level, the organisation of a Conference of Ministers responsible for the forests of Central Africa in 2000 provided a framework for harmonisation initiatives. This followed the

Declaration of Yaoundé, in which the ECCAS heads of state proclaimed, among other things, their support for the preservation of biodiversity and the sustainable management of tropical forests. These commitments were institutionalised in the Treaty on the Conservation and Sustainable Management of Forest Ecosystems in Central Africa and to Establish the Central African Forests Commission (COMIFAC) (2005). COMIFAC is the body responsible for formulating, harmonising and monitoring forestry and environmental policies in Central Africa.[121] Unfortunately, COMIFAC so far has not fulfilled the necessary regional legislative harmonisation imperatives.

8 Conclusion

The reflection on selected developmental and legal aspects shows the interdependent complexity of climate change, human security, water governance and the humanitarian crisis in the LCB region. Millions of people depend on Lake Chad. However, the lake's volume has decreased by 90% in area in the last 40 years due to increased drought, as well as human-related causes such as increased irrigation withdrawals. Existing regulatory regimes seem inadequate in preventing the above.

Research has also highlighted the interconnections between the impacts of climate change on natural resources, dependent livelihoods and food insecurity on the one hand; and tension, conflict and mobility on the other.[122] The ongoing crisis is affecting more than 17 million people across northeastern Nigeria, Cameroon's far north, western Chad and south-eastern Niger. Caused by the ravages of violent conflict, extreme poverty, underdevelopment and climate change, more than 10.8 million people are in need of humanitarian assistance.[123] To give more attention to the vulnerability aspect, attempts to link environmental issues to humanitarian security should influence the understanding of the interactions between water scarcity and socio-economic predicaments, which are exacerbated by climate change.

Conflict and fragility are decreasing the resilience of communities making them more vulnerable to climate change which at the same time is further undermining livelihoods and exacerbating the competition around increasingly scarce natural resources. If not broken, this vicious circle threatens to perpetuate the current crisis and take the region further down the path of conflict and fragility.[124] The scarcer resources become, the more power vests in those who control them. Moreover, where state or customary institutions are unable to equitably manage natural resources, competition for scarce resources is more likely to result in violence and situations of fragility.[125] The nexus

121 Article 5 of the abovementioned Treaty.
122 See with further references IOM (2018: 52).
123 CARE (2018).
124 Nagarajan et al. (2018: 25-26).
125 Nett & Rüttinger (2016: 19).

between climate change, vulnerability and humanitarian crises can only be unpacked holistically. In response to this, foreign policymakers have attempted to identify entry points for intervention in the region and effective modes of engagement.[126] The role of humanitarian aid and development cooperation play an increasing role in addressing the root causes of the LCB crisis.[127] This justifies why the integration of climate adaptation, water governance and conflict management in conflict-prone settings is now incorporated within progressive discourses of international environment and development agendas.[128]

Drawing upon evidence in the region, the explanation for conflicts over scarce resources, land, water, and so on, lies in the vulnerable status of the people, and is reinforced by environmental change. Trying to understand the link between conflict and environmental change is not so much a matter of challenging issues intellectually as attempting to bring solutions to the issues. Therefore, science, politics and law need to be brought together to make a significant and timely difference to humanity and especially to those most severely affected.[129]

Climate change permeates the law in many ways creating intersections of law in its diverse fields. Climate change law, an emerging legal discipline, is both international and domestic in nature.[130] Climate law (national, regional and international) should also form part of a social protection system for the LCB region, which has been facing a longstanding history of violent conflict and crisis. This is partly due to complex political instability and weak regulatory, economic and social policies. Regarding the legal dispensation, it will still have to be seen how the implementation and domestication of the LCB Water Charter will help to improve the situation on the ground. It is further hoped that the substantive financial commitments made by the international community can propel its implementation, also in light of other African Union and regional regulatory obligations.

One key challenge according to the Lake Chad Development and Climate Resilience Action Plan (2015) is to improve water and natural resources governance of the LCB, especially when it comes to more effective decision making, control and participation in public policy.[131] This has also been acknowledged by Resolution 2349/2017 of the United Nations Security Council, which recognises the complex challenges faced by the LCB region and welcomes the development of programmes by the respective governments to help build and sustain peace by addressing the root causes of

126 Nagarajan et al. (2018: 27).
127 Ibid.
128 Ludwig et al. (2011).
129 Ruppel (2012 and 2013); Ruppel & Ruppel-Schlichting (2012); and Ruppel & Wulff (2016).
130 Ruppel (2013: 37).
131 See <http://documents.worldbank.org/curated/en/489801468186879029/pdf/102851-v2-WP-P149275-Box394847B-PUBLIC-v2-main-report-Lake-Chad-Development-and-Action-Plan-English.pdf> (accessed 28-5-2018).

the crisis. In the same resolution, the Security Council calls upon respective governments to strengthen their coordination and prioritisation within these programmes to enable more effective implementation.[132]

Whether climate change is gradually moving from mere politicisation towards a state of securitisation remains to be seen.[133] Once an issue is successfully securitised it moves out of the sphere of normal politics to be dealt with as an emergency issue without the normal democratic processes being brought to bear, and the securitising actor can, through this process, infuse the concept of 'security' with any meaning desired.[134] Although such development would have some merits, in the context of the post-2015 Development Agenda, human security has already become a critical reference point.[135] The Declaration on the SDGs emphasises a world free of poverty, hunger, disease, want, fear and violence; with equitable and universal access to quality education, health care, social protection, safe drinking water and sanitation; where food is sufficient, safe, affordable and nutritious; where habitats are safe, resilient and sustainable; and where there is universal access to affordable, reliable and sustainable energy.[136] Although the term human security itself is not mentioned in the declaration, it stresses that sustainable development cannot be realised without peace and security and that peace and security will be at risk without sustainable development.[137] This is particularly true in the LCB, where water poverty affects large sectors of the population with no access to safe drinking water or which experience droughts impeding agricultural production.[138]

There are also growing suggestions that the 2015 Paris Agreement on climate change and the SDGs should provide vital entry points to spearhead opportunities for cross-thematic integration of vital issues confronting less developed nations. At a minimum, the template provided by these international processes can facilitate ways in which institutional, financial, technical and political dimensions of policy integration can be understood, reconciled and/or negotiated.[139] After all, the Paris Agreement is an agreement under international law. Its central objective is the determination of binding quality goals for the protection of the climate for nearly the entire international community. For the first time in human history, the international community has agreed to a quantified climate protection goal. If this goal is to be reached it will be through Nationally Determined Contributions (NDCs). All countries in the LCB

132 Resolution 2349 (2017) S/RES/2349 (2017), adopted by the Security Council at its 7911th meeting on 31 March 2017.
133 Ruppel (2013: 23).
134 Taureck (2006: 55).
135 Wählisch (2016: 5).
136 UNGA Res 70/1 'Transforming our World: The 2030 Agenda for Sustainable Development' (21 October 2015 UN Doc A/RES/70/1).
137 Wählisch (2016: 6).
138 See also wording on water scarcity in Africa in Pope Francis' *Laudato Si* (2015: 28).
139 Okpara et al. (2018: 40).

region submitted their NDCs prior to COP21 in Paris. Although the failure to reach the announced NDCs is not sanctionable according to the Paris Agreement, the LCB countries are expected to make national provisions to guarantee enforcement of their commitments.[140] Thus, the next step will be to begin implementing measures to achieve the NDCs. In the LCB, as in other regions of the world, this requires a firm political will to act, to develop and implement policy means that will contribute to reaching these national goals.[141]

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