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# A Shrinking Lake and a Rising Insurgency

## Migratory Responses to Environmental Degradation and Violence in the Lake Chad Basin

**T**he slow-onset environmental change occurring in the Lake Chad Basin (LCB) region of the Sahel is not a recent phenomenon, nor is it one that observers have only now begun to take note of. A bulletin published in June 1936 in *The New York Times* by the Associated Press reported on the efforts of French General J.M. Tilho to save Lake Chad, which had gradually decreased in size since Europeans had first discovered it 112 years previously (Associated Press, 1936). Despite Tilho's efforts to change the course of a nearby tributary, this shared vital resource has continued to dwindle over the years and today the issue has now become more pertinent than ever. The increased struggle for the lake's natural resources has had economic, social, and health-related ramifications on a growing local population. The emergence of conflict since 2009 due to violent extremist groups such as Boko Haram can, at least in part, be seen as a result of this slow-onset environmental degradation. It is the convergence of several underlying drivers—the deterioration of Lake Chad, demographic pressure, poor governance, a high degree of social diversity, and the rise of violent extremism—that have accelerated and exacerbated already complex migration patterns in 2014.

This paper seeks to examine the contraction of Lake Chad and the effects this has produced on the local population with regard to both conflict and migration. Section one explains the gradual evolution of the lake over the past 40 years and the underlying causes for this change. Section two will analyse the direct impacts of the lake's deterioration and the repercussions on poverty, resource conflicts, and ultimately violence and migration. Section three deals with past policy responses that have sought to address environmental degradation, the refugee crisis, and the security threat. The final section will take into account lessons from the past and current challenges to provide policy recommendations that seek to address both the symptoms and underlying causes of the crisis.

This paper draws on information from a variety of sources, including numerous reports, studies, conference proceedings, news articles, and online media, as well as on phone and e-mail interviews with field-based personnel at IOM and other humanitarian organisations. Efforts have been made to crosscheck these different data and, when necessary, point out any inconsistencies or flaws.

### **1. SLOW-ONSET ENVIRONMENTAL DEGRADATION IN THE LAKE CHAD BASIN**

The Lake Chad Basin is a geographic expanse covering 2,434,000 km<sup>2</sup> in the Sahel and spread across eight different countries. At the centre of the basin lies Lake Chad

itself, a shallow, freshwater lake shared between Cameroon, Chad, Niger, and Nigeria. It provides a vital source of water for both human and animal life in the region, and forms the basis of several economic activities that depend heavily on its resources, particularly fishing, agriculture, hunting and pastoralism (Onuoha, 2010).

Because it rarely reaches a depth of over seven meters, the overall surface area of Lake Chad is extremely sensitive to short and long-term climate variations as well anthropologic interventions. It is believed that in the 4<sup>th</sup> millennium BC, Lake Chad covered an estimated expanse of 400,000 km<sup>2</sup> (Onuoha, 2010). In the 1950s and early 60s however, its surface area covered approximately 26,000 km<sup>2</sup> and has since declined by over 90%, reaching its lowest point of 532 km<sup>2</sup> in 2004 (Onuoha, 2010). The northern portion of the lake is particularly sensitive and has completely dried up several times since 1975 (Lemoalle, Bader, Leblanc & Sedick, 2012). Today, Lake Chad has partially recovered from 2004 levels, now measuring around 2,500 km<sup>2</sup> (BGR, 2014; Essono, 2014). In addition to declining surface area, lake level depth has become more volatile in recent decades. Seasonal lake level variations averaged as low as half a metre and as high as one metre in the 1970s and 80s, whereas today variations can be as high as two metres (Geerken, Vassolo & Bila, 2010).

The Inter-Governmental Panel on Climate Change (IPCC) states that the two principle determinants of reductions in lake size are decreasing levels of precipitation and/or human interference (Onuoha, 2010). In the case of Lake Chad, both factors have played a major role in recent decades. Coe and Foley (2001) show that surface area decline in from 1950s to the mid-1970s was due primarily to reduced rainfall, whereas in the subsequent period, human activity nearly doubled the extent to which the lake would have otherwise declined. A long-term drought period from 1973-1984 not only directly reduced inflows from the lake's primary sources, but also forced agricultural communities who had depended on rainwater for crop feeding to increasingly turn to irrigation, further depleting lake inflows (Lemoalle et al., 2012). In the following years, irrigation activity increased four-fold when compared to the previous two decades (Coe & Foley, 2001). Human activity and climate conditions have thus become equal contributors to the lake's decline.

Since the 1990s, anthropologic intervention has continued to escalate. The region has seen a gradual rebound in rainfall levels and thus increased inflows into Lake Chad, yet the lake has continued to decrease in size due to misuse and overuse of irrigation practices and groundwater extraction (Okonkwo, Demoz & Gebremariam, 2014). Geerken et al. (2010) further show that groundwater extraction, in particular, has negatively altered the lake's hydrologic characteristics and has contributed to poor biomass recovery rates which should have otherwise benefited from the higher precipitation of recent years.

The anthropologic factors driving the changes in Lake Chad cannot be fully understood without examining the population dynamics in the region. In 1960, the population was estimated to number around 13 million. By 2013, it had grown to 47 million (BGR, 2015), and is expected to increase to 80 million by 2030 (Okonkwo & Demoz, 2014). In conjunction with this increase, a significant rise in livestock numbers has occurred in order to feed the population, which has put a further strain on lake use (Onuoha, 2010). The northeast region of Nigeria is the most densely populated area in the LCB. It is also highly diverse, and accounts for nearly half of Nigeria's 300 different ethnic groups (Onuoha, 2010). Here, population density corresponds to excessive degrees of groundwater extraction (Geerken et al., 2010). The city with by far the largest population in the region, Kano, has been identified as an "anthropologic hotspot", where the detrimental effects of human interaction on Lake Chad are the highest in the LCB (Okonkwo & Demoz, 2014).

## **A NOTE ON EXISTING FACTS, FIGURES, AND RESEARCH**

The above figures relating to the surface area reductions in Lake Chad are those most prominently reported in the media. While they are effective in adequately showing the dramatic size decline over the years, it is worth noting that researchers and environmental experts who study this region consider the size of the lake in the 1950s and 60s to have been abnormally large—an observation often absent from reports in the media. Four generally accepted classifications exist to express the size of Lake Chad, ranging from Large, Normal, Small, and Dry Small (Lemoalle et al., 2012). The 26,000 km<sup>2</sup> figure noted above easily falls into the “Large” classification, whereas 18,000 km<sup>2</sup> is considered the size at which the lake is at a Normal state and which was last observed in 1973-1975 (Lemoalle et al., 2012). Further overlooked in news articles is the fact that Lake Chad’s shallow characteristics mean dramatic fluctuations in size are not uncommon. Odada, Oyebande and Oguniola (2005) note, for example, that Lake Chad completely dried out four times between the years 1400 and 1901.

The tendency for some media outlets and environmentalists to downplay certain elements of the story is noted to give as accurate a portrayal of this slow-onset event as possible. A thorough perspective of this nature is helpful in determining the extent to which policies and corrective measures must be employed to stabilise the lake’s condition and restore it to a Normal state.

The origins of the information behind widely circulated reports are also important to consider. One of the most often cited studies, in UN documentation and elsewhere, is Coe and Foley’s *Human and natural impacts on the water resources of the Lake Chad basin*, published in the *Journal of Geophysical Research* in February 2001. Some researchers, however, believe this study to be flawed in certain aspects, even if its main findings are widely accepted and reported upon. Lemoalle et al. (2012) note that Coe and Foley’s satellite data analysis is insufficiently documented, but suggest that their work has endured due to lack of ground-based observational research. Additionally, their argument linking overgrazing to the shrinking of Lake Chad is, according to a recent FAO/LCBC conference, “difficult to substantiate” (De Young, Sheridan, Davies & Hjort, 2011). This suggests the importance of careful interpretations of existing data and the need for more high-quality research in the years ahead.

## **High vulnerability in the Lake Chad Basin**

Vulnerability to the impacts of environmental change in the Lake Chad Basin is extremely high. All of the region’s major economic sectors are engaged in climate-sensitive activities, and several of them, including fishing, agriculture, and livestock production, rely directly on the resources of Lake Chad itself (Okonkwo & Demoz, 2014). Moreover, the local population is dependent on the lake as a source of drinking water, sanitation, and as a means of carrying out religious or cultural activities (Onuoha, 2010). Yet, the capacity to respond to threats posed by the shrinking of Lake Chad are extremely limited due to conditions of poverty, low levels of economic and political stability, weak institutions, and inadequate information (FAO, 2014).

Low amounts of human, social, and technical capital in the region compound and exacerbate downward pressure on environmental capital. Poor education, health, and income are reflected in Human Development Index ratings in the four Lake Chad countries that are among the lowest in the world. Out of the 187 countries ranked in the 2014 UNDP Human Development Report, both Cameroon and Nigeria ranked 152, Chad 184, and Niger, at 187, was ranked the poorest nation in the world (Malik, 2014). The problem is particularly severe in northeast Nigeria, where in 2007 an estimated 72% of the population lived in poverty (Onuoha, 2010). This has left inhabitants with limited capacity to respond to the impacts of environmental change.

Social capital in the form of institutions is severely lacking as well. World Bank governance indicators for 2013, which include measurements of accountability,

government effectiveness, regulatory quality, rule of law, and corruption control, show that the four Lake Chad countries rank lower than the Sub-Saharan African average in nearly every category (Kaufmann, Kraay & Mastruzzi, 2014). Particularly relevant to the region is the Political Stability and Absence of Violence/Terrorism indicator, where Nigeria and Niger rank very low, 9<sup>th</sup> and 22<sup>nd</sup> worst in the world, respectively. In terms of regional institutions created specifically to oversee Lake Chad and other water resources in the LCB, the Lake Chad Basin Commission (LCBC) was established in 1964 by the governments of Cameroon, Chad, Niger and Nigeria following the signing of the Fort-Lamy Convention. The Central African Republic and Libya have subsequently joined the LCBC. Despite a mandate to sustainably manage Lake Chad and other trans-border water and ecological resources while promoting peace and security within the region, the commission continues to lack funding, data, and a strategic approach to carry out its objectives (Odada, Oyebande & Ogun-tola, 2005). Finally, even if effective institutions in the region are established, huge coordination challenges result in a failure to align the activities and objectives of local, state, national, and regional stakeholders (FAO/LCBC, 2009; Odada et al., 2005). As a consequence of these weak institutions and impediments to effective collaboration, populations in the LCB are at a greater risk of being negatively impacted by the effects of environmental degradation.

## **2. IMPACTS OF ENVIRONMENTAL DEGRADATION: A CONVERGENCE OF FACTORS**

The environmental degradation of the LCB region, particularly the shrinking of Lake Chad, has impeded development and contributed to conditions of poverty (Okonkwo & Demoz, 2014) for several reasons. All of the region's major economic activities have been adversely affected, leading to complex migration patterns in the past (Odada et al., 2005), which have carried through to 2014 where they have taken on a new, conflict-related dimension.

Food and water scarcity that have resulted from a decline in lake size have become major and chronic issues—among the worst in Africa. Not only must a growing population make do with lower water quantities, but the quality of water has deteriorated as a result of people defecating or washing clothes in the lake (Onuoha, 2010). Irrigation schemes developed in the 1970s in Nigeria that would have produced only a marginal negative impact on Lake Chad inflows can no longer operate as their intakes were designed for Normal lake conditions and not the Small or Dry Small states that have persisted in recent decades (Lemoalle et al., 2012). As a result, agricultural activity has become less feasible in the areas where these irrigation projects were to be utilised.

Reduced surface area and lake level mean that transportation and navigation along the lake has, to an extent, been affected as well with the emergence of a scattering of small islands and a wide-spanning ridge that was previously underwater. Known as the Great Barrier, the ridge now divides Lake Chad into a northern pool and southern pool. Prolonged separation of the two pools may have further implications for the ecological development and migration patterns of fish (Lemoalle et al., 2012). Between five and eight species of fish have died out in the region, and in one part of the LCB, fishing yields were reduced by up to 90% (Odada et al., 2005). In a part of the Sahel where 80% of the poor depend on fish as a regular and cheap source of protein, this development has profound implications for food security (De Young et al., 2011) as well as economic activity. Despite a decrease in fish stocks over the years, 150,000 fishermen still depended on the lake for their livelihoods as of 2010 (Onuoha, 2010).

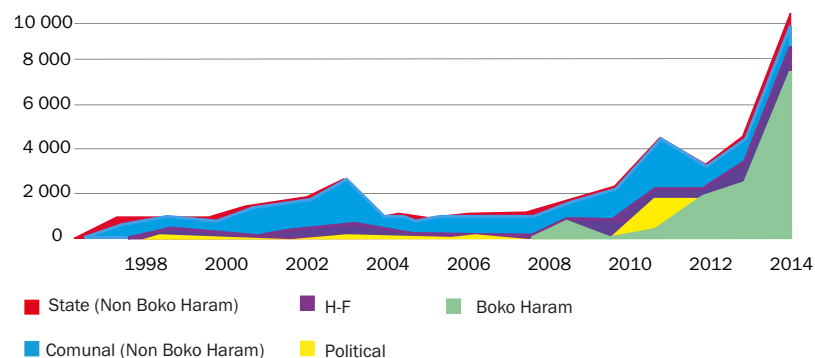
## Migration: Economic, Social, Demographic, Political, and Conflict-Related Drivers

Some of the local population have shifted their economic activities over the years as a way to adapt to the progressively smaller lake. Fishermen in particular, have migrated in search of better fishing grounds, either temporarily, such as on a seasonal basis, or permanently, as near-shore stocks are depleted (De Young et al., 2011). Some have been attracted to the small islands that have emerged in recent years, which now host to several fishing communities (Coly, 2015). In many cases, this leads to lengthening the distance fishermen must travel between their homes, fishing grounds, and the marketplaces where they sell their catch. Alternatively, these people may decide to exit the industry entirely to become farmers. Those who do often move to the fertile lands where the lake has receded in order to plant their crops (NASA/Goddard Space Flight Center--EOS Project Science Office, 2001).

Likewise, environmental changes in other areas of the LCB have drawn many farming households to the vicinity around Lake Chad in order to sustain their livelihoods. For example, decreased rainfall since the 1970s has resulted in once arable land in the northern areas of the LCB becoming unsuitable for millet cultivation. As a result, farmers have turned to the more fertile soil around Lake Chad, moving there in order to grow a different variety of crops (Lemoalle et al., 2012). Similar to fishermen, a large portion of farmers and pastoralists alike migrate on a seasonal basis in search of land better suited for agriculture or grazing (De Young et al., 2011). Fluctuations in the size of Lake Chad have undoubtedly impacted where they settle and how long they must travel in any particular season.

Additionally, fishermen, farmers, pastoralists or others struggling to maintain their livelihoods based on the lake's resources may decide to leave it altogether and migrate to a city in search of better opportunities. Often, it is the younger population who moves away and settles in urban slums where, according to an ICG report, they are more prone to lawlessness and violence (International Crisis Group, 2010).

**Figure 1. Fatalities in Nigeria from Social Violence, by Category, 1998-2014**



Herder-Farmer violence. We have distinguished a separate category of violence between herders (pastoralists) and farmers, which is analytically distinct from other types of communal violence and separate from the Boko Haram insurgency. Other categories include: State-related violence apart from the Boko Haram insurgency; Communal Conflict (between ethnic/religious/local groups) apart from the insurgency; Political violence (i.e. attributed to partisan actors); Boko Haram, violence by militants or state actors linked to the insurgency

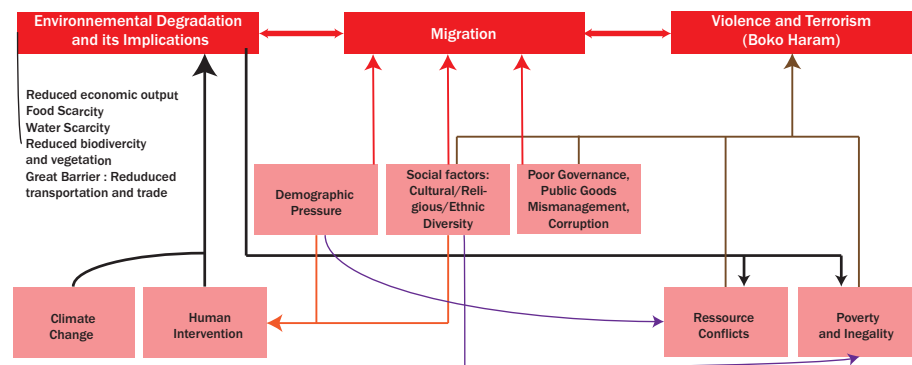
Source: Nigeria Social Violence Project, 2014 <http://www.connectsaisafrica.org/research/african-studies-publications/social-violence-nigeria/>

As a result of the adverse effects of environmental degradation on the region's major economic activities, domestic and cross-border international migration has escalated in recent years (Onuoha, 2010). With this occurring in the context of a

highly vulnerable, diverse population facing major threats of food and water insecurity, it should come as little surprise that conflict in the region has swelled in recent years, beginning in 2009 and reaching unprecedented proportions in 2014. According to a project at Johns Hopkins University which tracks social violence in Nigeria, fatalities jumped by over 50% in 2014 and were highly concentrated in the north-east – the region depending most heavily on Lake Chad and its resources (Nigeria Social Violence Project, 2014). The overwhelming majority of these deaths came at the hands of Boko Haram, the insurgency seeking to overthrow the Nigerian government and establish an Islamic state. By some accounts, Boko Haram was responsible for just under 8,000 deaths in 2014 (Nigeria Social Violence Project, 2014), while other sources place the number closer to half that amount (Barna, 2014).

At first glance, it may seem far-fetched to link environmental degradation in the LCB to the violence that has erupted since 2009. However, if the underlying determinants of this violence are closely examined on the one hand, and the implications of the deterioration of Lake Chad on the other, several ways in which the two are interconnected become clearly apparent. Onuoha (2010), argues that conflict as a result of environmental degradation can occur for two reasons: “*First, by intensifying the frequency of contact between and among the major livelihood systems, thereby making them more competitive rather than complementary. Second, it intensifies the pattern of migration as a response to the contraction of the lake*” (p. 32).

**Figure 2. Convergence of Environmental Degradation, Violence Inflicted by Boko Haram, and Migration in the Lake Chad Basin**



Source: Jason Rizzo

In the diagram above, competition among livelihood systems is represented by the two green arrows leading from the “Environmental Degradation and its Implications” section, on the left, to the “resource conflicts” and “poverty and inequality” boxes on the lower right. These factors, in turn, make up two of the four conditions under which Boko Haram and the violence it has inflicted have emerged. In north-east Nigeria, where resources are scarce and not equally distributed by the State, competition for control of these resources is fierce (Agbibo & Maiangwa, 2013; International Crisis Group, 2010), all the more so with nearly three-quarters of the population living in poverty and barely able to survive on what little they are currently able to secure. Noting the struggle for public resources in all areas of Nigeria, an excerpt from a report by the International Crisis Group (2010) states:

*Tensions have been exacerbated by policies favouring indigenous groups. In all parts of Nigeria, those who can claim to be original inhabitants have a disproportionate share of public resources, an exclusive right to buy and sell land and various other privileges. This generates a huge number of disputes and often*

*violent conflicts over competing claims, as well as over the validity of the “indigeneity certificates” issued by local government authorities, especially in the context of internal migrations* (p. 11).

Poverty in and of itself is a condition Boko Haram has found complementary to its empowerment; many of its recruits are poor, young and have little in the way of employment opportunities that would serve as effective alternatives to joining the insurgent group (Agbiboa, 2014; Barna, 2014). Moreover, the group has used funding to provide “alms to the poor and needy” (in line with the practice of zakat, one of the Five Pillars of Islam), and to extend basic services that the government has failed to adequately offer (Onuoha, 2012, p. 3). Conditions of poverty, therefore, have not only helped Boko Haram increase its membership base, but have also assisted the group in positioning itself as an organisation that is sensitive to the needs of the local population, especially in comparison to the government.

To visually represent Onuoha’s second point, namely that environmental degradation “intensifies the pattern of migration as a response to the contraction of the lake”, the red lines along the top of the diagram show the corresponding connections. In this respect, environmental change is seen as both a direct driver of migration as well as an indirect driver of violence by way of this migration. Thus, in the LCB, migration is not only a consequence of violence, it is also a driving factor of violence. In 2014, however, causality seems predominantly to have moved in the direction of violence impacting migration, reflected in the fact that communal violence unrelated to Boko Haram was relatively minor (Nigeria Social Violence Project, 2014).

Also apparent from the diagram is the fact that three other factors that have already been observed through their relation to environmental degradation and the vulnerability of the local populations have also played a role, either directly or indirectly, in creating the necessary conditions for Boko Haram’s emergence. Firstly, demographic pressures play an obvious role in exacerbating resource conflicts—more people translates to less finite resources to share among them—and thus indirectly contributes to increasing levels of violence.

Secondly, the social make-up of the local population, in this case high levels of ethnic diversity and a growing divide between Muslim and Christian groups, is also a factor that potentially serves to accelerate violence directly while also providing the necessary backdrop to facilitate the role of the other drivers. Collier (2009) notes that in poverty-stricken, resource-limited settings, people are incentivised to remain loyal to their ethnic group as a form of insurance. This has violent ramifications for regions like northeast Nigeria and the LCB as a whole, where political power is not always aligned with perceptions of ethnic or religious identity. As noted above, resources are not distributed in an equitable manner, thus the struggle to control them has become more prominent. In this light, it is apparent that social factors alone are likely exerting only limited influence on conflict in the region. Rather, it is through their interaction with poor governance and conflict over resources that ethnic and religious diversity provides, as noted by Agbiboa and Maiangwa (2013), “the fault line along which inter-group competition for power and resources occurs”.

It is worth briefly noting that this social dimension is also most certainly contributing to coordination failures that have aggravated problems of increasing anthropologic impact on Lake Chad. Collier (2009) argues that the provision of public goods, such as the management of water wells in rural villages is often better conducted in homogenous settings, or where efforts have been made by local governments to downplay social divisions and instead emphasise shared commonalities and a national identity. In the absence of such unifying policy measures in northeast Nigeria, this effect is likely contributing to the swelling anthropologic interference on the lake. For simplicity’s sake, this connection linking social factors to human intervention and thus environmental degradation has been left out of the diagram above.

A third driver of violence is the central role of poor governance, weak political institutions, and corruption. As has been discussed above, poor governance can be linked to environmental degradation, and the resulting impacts set the stage for increased levels of conflict. The Nigerian government, however, can also be more directly linked to violence due to its failure to address issues of poverty and resource scarcity, and its unwillingness to reign in a provocative, violent, and hugely unpopular military and police force. Both these points can be seen when examining Boko Haram's emergence and in its eventual turn toward violence in 2009. The group was initially founded as a peaceful movement in response to growing levels of corruption and poor public services (Barna, 2014). Its objective was to establish such services itself, including "mortality police" and a welfare system. In 2009, following increased tension with the Borno state government, Nigerian security forces extrajudicially killed the group's highly popular founder and leader, Mohammed Yusuf, along with a large number of his followers (Barna, 2014; International Crisis Group, 2014). The military crackdown no doubt triggered support for the group and provoked its shift toward violence.

**Photo 1.** Refugees arriving to small islands in Lake Chad following violence in Nigeria.



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The impact of violence on migration due to the underlying drivers of environmental degradation, a growing population, poor governance, and social factors, reached a critical point in 2014, which was by some distance Boko Haram's most violent year to date. Huge flows of forced migration were triggered in the north-east and contributed to Nigeria having one of the highest amounts of internally displaced people in the world (Barna, 2014). Cross-border international migration has also accelerated due to the violence. Initial reports in May 2014 estimated that 61,000 refugees had left the country for Cameroon, Chad, or Niger (UNHCR, 2014a). Of this figure, only 22,000 are thought to be Nigerian, with the remainder being mainly Niger nationals. In July, more than 15,000 people fled when Boko Haram entered and took control of the city of Damboa—the first time the group had succeeded in such an undertaking (Barna, 2014). By the end of 2014, IOM estimated that approximately 120,000 refugees had fled Nigeria for neighbouring countries (International Organization for Migration, n.d.).

The degree of internal displacement within Nigeria as a result of the violence was found to be even greater. In July, IOM implemented its Displacement Tracking



Matrix (DTM) tool in order to more effectively gather and monitor information on internally displaced populations within the country (International Organization for Migration, n.d.). When figures were tallied at the end of December 2014, they were starkly different from initial estimates. Data gathered by the DTM in five of the northeast states affected by the violence placed the number of IDPs at 389,281. Borno, the state bordering Lake Chad where Boko Haram activity is concentrated, was not included in this first DTM report due to security constraints. Here, however, the Nigerian National Emergency Management Agency estimated 522,523 IDPs. Taking the two previous figures in combination with IOM's estimate of 120,000 cross-border refugees, the total number of displaced people was thought to be over 1 million (International Organization for Migration, n.d.) in 2014.

IOM has since released five subsequent DTM reports using a unified system of data collection with the Nigerian government that now includes limited coverage of Borno state (Daviot, 2015). The latest figures are staggering. The DTM Round VI Report issued in October 2015 indicates that the number of IDPs in Nigeria alone has swelled to over 2.2 million (IOM & NEMA, 2015). 72% come from Borno state, and there are most probably many tens of thousands that are still unaccounted for given the limited access IOM and government officials have to this region. Overall, children make up 57% (approximately 1.25 million) of the IDP population (IOM & NEMA, 2015). To put this figure in perspective, the number of displaced children in Nigeria is more than 50% higher than the *entire* refugee or migrant population accounted for in the on-going European crisis (UNHCR, 2015).

### 3. POLICY RESPONSES

Policy responses designed to address the combined effects of environmental degradation, the refugee crisis, and the security threat have been slow to emerge, though awareness of the problem grew significantly in 2014 amid the escalating violence. Given the interconnected and multifaceted nature of the problem, no silver bullet will exist to tackle all of these challenges in a simple manner. Stemming the violence and providing humanitarian relief to the large number of refugees is of immediate concern, though long-term actions to address the underlying drivers of these problems must be streamlined and prioritised as well. This study will now examine the conditions facing refugees and IDPs, and the policy actions that have been enacted to respond to the crisis in terms of migration, violence, and environmental degradation.

Many refugees find themselves separated from their families and in highly precarious situations, in which the need to provide them humanitarian assistance is especially great. Emilie Poisson (2015), Africa Regional Director of External Relations & Advocacy at ACTED, a French NGO operating in the region and working in partnership with the UN, indicated that many refugees arriving in Chad are in poor physical condition following days with little or no access to food. Furthermore, their psychosocial state is often fragile after having experienced acute violence, death of family members, and loss of homes and livelihoods, yet access to even basic assistance and services in these areas is lacking (Poisson, 2015). A large portion of the refugee population in the region consists of unaccompanied minors or separated children. Women and girls are especially vulnerable to sexual and other forms of gender-based violence as arriving refugees.

In Cameroon, Chad, and Niger, there have been several documented incidents of refugees having to move more than once as a result of unsafe or unsuitable initial destinations. In an effort to avoid harbouring members of Boko Haram and other terrorist organisations, Niger had originally forbidden the establishment of refugee camps along the country's southern boarder (Barna, 2014). This forced many newly arriving refugees to seek temporary shelter in abandoned homes that were

susceptible to flooding during the rainy season (UNHCR, 2014a). It was not until early 2015, following attacks in Niger's Diffa region, that the government allowed camps to be set up for refugees, returnees, and IDPs (Poisson, 2015). In the far north of Cameroon, initial settlement communities have also been subjected to Boko Haram attacks, forcing refugees to flee an additional 150km to less-volatile areas (UNHCR, 2014a). In yet another example, several large refugee movements headed to the small fishing islands in Lake Chad, putting enormous pressure on host populations in terms of hygiene, space, and community life (Coly, 2015). According to Ibrahima Coly, Regional Coordinator for West and Central Africa at IEDA Relief, a UNHCR and IOM partner organisation, the government of Chad made concerted efforts in 2014 to relocate refugees from the islands to areas inland that are safer and where access to humanitarian assistance can be provided more easily (Coly, 2015). Nevertheless, the islands still serve as a layover point and several refugees are tempted to stay to practice fishing (Coly, 2015). As a result, Poisson (2015) notes "competition for land and natural resources between communities could potentially intensify." The above events suggest that in all destination countries, humanitarian protection and information related to safe areas of refuge were lacking in 2014.

The provision of assistance and services to IDPs in Nigeria was also scarce in 2014. The Internal Displacement Monitoring Centre (IDMC) noted that state emergency management agencies have limited capacities and no clear regulatory framework dictating their role in providing support to IDPs after their initial displacement (Rushing & Reed, 2014). As a result, the majority of IDPs first find assistance through host communities before any relief that may come from state or humanitarian actors. Indeed, over 92% of IDPs were living with host families while only 7.6% were living in camps at the end of 2014, with this ratio remaining largely unchanged throughout 2015 (IOM & NEMA, 2014; IOM & NEMA, 2015). Coly (2015) notes, that many host communities find themselves in desperate and poor conditions even before the arrival of IDPs, explaining why they are often unable to administer adequate humanitarian services to incoming people. Despite Nigeria's ratification of the Kampala Convention in 2012, there appears to be little political will to push through IDP policy reform (Rushing & Reed, 2014), although this may change with the election of Muhammadu Buhari as the country's new president.

There are some signs of hope on the policy and intervention front with regard to the refugee crisis. Efforts to overcome issues of coordination among national and international agencies are reflected in the 2013 publication of a joint humanitarian action plan by Nigeria's National Emergency Management Agency (NEMA), which entails improved data collection and overall response efforts (Rushing & Reed, 2014). Ms. Poisson (2015) of ACTED noted that international agencies are working "to strengthen collaboration with local authorities to ensure access to asylum, reduce the risk of refoulement and facilitate freedom of movement". Similarly, inter-agency assessments of refugee areas in Cameroon, Chad, and Niger were carried out in 2014 to identify needs and vulnerabilities of displaced populations. Child protection, gender-based violence, preservation of family unity, and the provision of services such as education and social protection were issues that were found to be most in need of improvement (UNHCR, 2014b).

Regarding the security threat posed by Boko Haram, actions have been implemented to stem the violence and address its underlying causes. Attacks on villages in all of the Lake Chad countries have prompted the governments of Cameroon, Chad, and Niger to intervene militarily in conjunction with the Nigerian army to more effectively fight insurgent forces (Coly, 2015). To confront the major issues of government and military accountability in Nigeria, the National Human Rights Commission has started to become more active in recent years, and in December 2013 succeeded for the first time in summoning some of the nation's top military generals to testify regarding allegations of unlawful violence and extrajudicial killings (Associated

Press, 2014). Several development projects are seeking to rectify the underlying problems of poverty and poor public services. One such example is a \$100 million joint program between the government, the UN, the African Development Bank, and Nigerian business leaders that was established in May of 2014 to create safer community and educational-based facilities in the north (Rushing & Reed, 2014). A proposal for a more comprehensive and long-term development programme is discussed in further detail in the following section.

**Table 1. National and international agencies are continuing to engage in the following activities to respond to the needs of refugees.**

Border monitoring to enhance access to asylum and prevent refoulement	Creation of mechanisms to allow for family tracking and reunification
Maintenance of civilian character of asylum	Enhancement of procedures to identify newborn children before or upon camp arrival
Refugee relocation from insecure areas	Identify and manage at risk children, including girls subjected to early marriage
Awareness campaigns to encourage refugees reluctant to move from insecure areas	Working with local authorities to establish Standard Operating Procedures (SOPs) in the interest of children
Piloting biometrics registration	Establish SOPs to provide aid and community support to people with specific needs
Provision of refugee and civilian documentation	Establish SOPs to prevent and respond to gender and other forms of sexual-based violence (GSBV)
Training and support of worker and refugee communities	Enhance provision of support to victims of GSBV
Enhancement of refugee camp safety through establishment of vigilance committees	Training of women in conflict prevention and mediation leadership roles
Support of social cohesion activities and women peace committees	Training of humanitarian and security personnel, especially in women's protection
Counseling to provide psycho-social support	

Source: Emilie Poisson, Africa Regional Director of External relations & Advocacy, ACTED (2015)

With regards to environmental degradation, indications are starting to emerge that policymakers in the LCB have begun to realise the gravity of the problem and its implications for future migration, violence, and socio-economic development. Last year, Chidi Anselm Odinkalu, chairman of Nigeria's National Human Rights Commission, stated that, "climate change is real, the consequences are real and it's got a serious national security consequence," though he further noted that Nigerians "don't take it seriously" (Associated Press, 2014). There have been several initiatives launched in recent years by the LCBC in conjunction with partner organisations. In 2008, a Strategic Action Programme (SAP) was passed by all LCBC member States, encompassing both short and long-term initiatives to reverse the environmental trends of the past half-century (LCBC, 2008). One of the most significant and relevant of these for 2014 is the Five-Year Investment Plan 2013-2017. In April, funding for the Plan was still in the process of being secured (LCBC, 2014), but part of the Plan will apparently include an inter-basin water transfer project (Premium Times, 2014) that would more than triple the size of the lake from current levels (LCBC, n.d.).

#### 4. POLICY RECOMMENDATIONS

Despite some of the noted policy progress in recent years, political commitment and concrete policy interventions still have a long way to go. Momentum must therefore continue to grow and future policy design should address the complex web of challenges in a holistic way. In this light, the following section details four key policy recommendations and the necessary preconditions that must exist for the desired outcomes to transpire. They should be considered as a joint package, as any of the following measures taken individually will have a limited impact on a problem that has several root causes.

As a prerequisite to all policy recommendations, it should be noted that significant effort must be made to ensure active stakeholder engagement at all levels. This issue was underscored in March 2014 by Jonathan Kamkwala, World Bank Manager for Water Resources and Disaster Risk Management, who said, “the issues are challenging at the sectorial, national and regional levels. As such, they require a variety of stakeholders to cooperate on solutions. The ministers of water, environment and agriculture will have to work together to ensure coordination of policies that affect the lake resources” (World Bank, 2014). This implies political will and a commitment to inclusivity on the part of all governments. As such, the new leadership in Nigeria would do well to finally establish the National Climate Change Commission, which was approved and passed by the National Assembly in 2010, yet has been pending presidential approval ever since (Onemola, 2014).

In terms of the specific policies aimed at environmental restoration and preservation, it is important to note that we are only now starting to learn of certain hydrologic characteristics of Lake Chad and the manner in which they are affected by human activity. The research conducted on the lake’s relationship with groundwater and underwater aquifers, for example, is just a few years old. Greater awareness, better data, and further research along these lines is needed in order to make informed policy decisions about proper resource management, especially in areas of dense human population that are prone to act as anthropologic hotspots. To its credit, the LCBC’s Five-Year Investment Plan calls for several studies that aim to improve understanding in the areas of water pollution controls, ground and surface water observation, water control for sustainable agricultural production, and exploitation and protection of the lake’s biological resources (LCBC, 2014). The ultimate impact of the proposed research, however, is contingent on sufficient provision of funds and proper implementation on the part of national governments and international partners. The current reality is a vivid, if disappointing, case in point. Nearly three years into the LCBC’s Five-Year Investment Plan, its current capacity to monitor real-time hydrologic indicators is severely restricted due to underfunded and unmaintained national monitoring networks, particularly in Nigeria and Cameroon (Walbadet, Moutadé, Ndara & Lawan, 2015).

##### **Policy Recommendation #1 (Environment) – Improve water efficiency**

As noted in the previous section, several projects are now being carried out or considered as a part of the LCBC’s SAP to stem the shrinking and degradation of Lake Chad. One topic area that should receive more attention is water-use efficiency. In order to enhance water and food security in the region, LCB countries must commission studies, carry out pilot projects, and scale up initiatives to decrease water wastage and improve the means by which water is used and transported. Odada et al. (2005) state that water-use efficiency in the region’s irrigation systems is very low, around 11%. With smallholder farmers accounting for 75 to 80% of the overall farming population (FAO/LCBC, 2009), the difficulty will reside in designing policies and programmes that appeal to and are adopted by a wide selection of farmers. Small-scale irrigation technologies have been successfully implemented in some areas (FAO/LCBC, 2009).

Additional small-scale irrigation options and pilot projects should be considered and then scaled up so that they are made widely available to all segments of the population. Appropriate marketing and educational materials that are flexible and tailored to the needs of individual communities should be incorporated into these initiatives to ensure their success.

Additionally, future large-scale irrigation schemes must take into account anticipated water level changes. Ideally they can be designed to allow for intake at various lake water levels and surface area dimensions. As previously mentioned, projects such as the one carried out in Nigeria in the 1970s have become irrelevant because their water intake was designed for Normal or Large lake conditions and not the Small or Small Dry conditions that have persisted since then.

### **Policy Recommendation #2 (Security) – Reign in the military and hold them accountable**

This recommendation is specific to Nigeria and aims to tackle one of the main drivers of violence in the region. The military must be reigned in and held accountable for their actions. To this end, the National Human Rights Commission must not only continue to be supported by the country's new leadership, but it must also be given the power to enforce decisions based on its findings. Information on efforts to bring the military and police forces to justice should be made widely available, especially to the population in the northeast of the country. One way of accomplishing this would be for the government to create a transparency and local feedback initiative, where people can easily receive the latest information regarding human rights abuses and further voice their grievances and/or contribute to public dialogue on security-related issues. Such a programme would also foster a gradual restoration of trust between locals and the government.

### **Policy Recommendation #3 (Migration) – Streamline passage of migrant rights legal framework**

To address some of the largest challenges presented by the refugee crisis, clear indications must be established around the rights of refugees, whether they are internally displaced, foreign refugees, or returnees. Agencies and ministries must also be given clear and distinct roles so that the provision of aid and humanitarian assistance is carried out in an effective and timely manner. These institutions must also be allocated the resources they need to carry out their work. Adequately trained personnel, funding, and access to accurate data and supplies are all obvious examples.

While Nigeria is the most conspicuous case in which a policy of this nature is needed (particularly with regard to IDPs), it would be to the benefit of all migrants and LCB host countries alike for governments to align as best as possible the legal protections and regulatory frameworks necessary to respond to emergencies. As has been demonstrated above, cross-border international migration as a result of both environmental degradation and violence is always to another LCB country. With this in mind, Cameroon, Chad, Niger, and Nigeria should consider the establishment of a new regional body, similar in concept to the LCBC, but designed with the specific objectives of aligning migration policy, gathering and disseminating data, establishing and maintaining a rapid-response fund, and better coordinating humanitarian efforts among national bodies. Even in non-crisis situations, this regional institution would play a vital role in monitoring voluntary and seasonal migration, and offering policy guidance to local governments to ensure equitable rights and services for all migrant groups. Doing so would not only help reduce the likelihood of migration-induced conflict between nomadic or semi-nomadic populations, but it would also provide an opportunity to identify in advance areas of potential resource or social dispute and then pre-emptively organise mitigation and response efforts.

**Policy Recommendation #4 (Cross-cutting) – Improve education and employment opportunities, particularly among women**

The above three recommendations can be seen as priority interventions to be carried out in the short and medium terms in order to address present-day failures in the LCB. Here, a fourth and final recommendation is considered as a long-term initiative designed to tackle several of the underlying and interlinked causes found at the nexus between environmental degradation, migration, and violence in the LCB. This recommendation calls for a comprehensive development programme to improve access to and quality of educational and employment opportunities in the region, particularly among poor women. Conditional cash transfer initiatives for mothers with school-aged children, teacher training, construction and renovation of schools, micro-credit schemes, adult training and education, and the establishment of women's employment associations are all examples of different components that could be included in the wider development programme.

If properly funded, designed and implemented, a programme of this nature is likely to produce several positive outcomes. The most obvious is an increase in the level of income among poor families, which would serve to reduce poverty as well as vulnerability to climate change and environmental degradation. It has already been discussed how Boko Haram was born out of and continues to thrive in conditions of poverty, poor public services, and weak governance. A major poverty reduction programme that produces higher income through better provision of education and employment opportunities would greatly diminish Boko Haram's rationale and motivational influence. At the same time, increased income levels can allow families to choose from a wider range of available migratory options in the event of violence, extreme weather events, or other life-threatening circumstances.

While these are all positive developments in their own right, several additional indicators key to economic and social development could be expected to improve as well. Past studies, for example, have found that higher levels of women's education and labour force participation are two of the most effective determinants in producing lower fertility rates (Sen, 1999). In the LCB, lower fertility and reduced demographic pressure would help to correct problems of resource conflict, human-induced environmental degradation, and migration. Higher overall educational achievement would also improve awareness on issues such as climate change, sustainable resource management, and environmentally friendly practices across different livelihoods. Employment initiatives that specifically target women, who often bear the greatest burden in situations of poverty, will also serve to reduce income inequality. Wilkinson and Pickett (2009), among others, have convincingly demonstrated that lower inequality has wide ranging positive implications on measures such as social trust, mental and physical health, life expectancy, and violence in both developed and developing nations. It can be further argued that increasing educational and economic activity among women would result in more inclusive social and cultural attitudes, which, in a region as diverse as the LCB, is essential in contributing to peaceful and cooperative co-existence among different ethnic and religious groups.

Similar programmes in the LCB that have been attempted in past were too short-term and narrowly focused to produce any lasting results. Nigeria recently concluded a one-year conditional cash transfer programme that, while temporarily improving income and educational enrolment, did little to address structural problems within the education system (Akinola, 2014). It is therefore important to emphasise that this recommendation calls for a long-term comprehensive package consisting of multiple component projects to address shortcomings at each stage in both the education and employment chains.

## CONCLUSIONS

Displacement of populations in the Lake Chad region in 2014 can be explained by five underlying and inter-related determinants. The slow-onset degradation of Lake Chad due to climate change and greater degrees of human activity that have interfered with the lake's natural characteristics is one key driver that has produced knock-on effects contributing to resource conflict and poverty in the region. These implications, in turn, when combined with poor governance (including corruption, and weak provision of public goods) and an ethnically and religiously charged setting have fuelled the rise of violent extremism, which can be seen as another key driver of migration in 2014. Demographic, political, and social factors are all strongly intertwined with environmental degradation and violence, and can also be viewed as direct drivers of migration in their own right. Additionally, a feedback loop can be observed between violence and migration. While violence contributed greatly to forced migration in 2014, migration itself as a response to reduced lake levels led to increased conflict as livelihood systems compete over resources.

Over 1 million people were displaced in the region following the events of 2014, a figure that more than doubled throughout 2015. Governments and aid agencies have had no choice but to begin to respond to the refugee crisis and its underlying causes. While important first steps have been taken, refugees and IDPs remain vulnerable and underserved, particularly in the areas of child protection, gender-based violence, family unification, education, and social protection. Likewise, current policy actions to address the root-cause issues of environmental degradation and violence are headed in the right directions, but are insufficient to reverse the current trends and ensure sustainable outcomes. As such, a comprehensive policy package should be considered to improve water-use efficiency, reform Nigeria's military, establish a clear and unified legal framework for migrant, refugee, and IDP rights, and enhance educational and employment opportunities among women. Success in both the short and long-term in any of these areas will require strong political will and a commitment to engage all stakeholders at local, state, national, and regional levels.

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