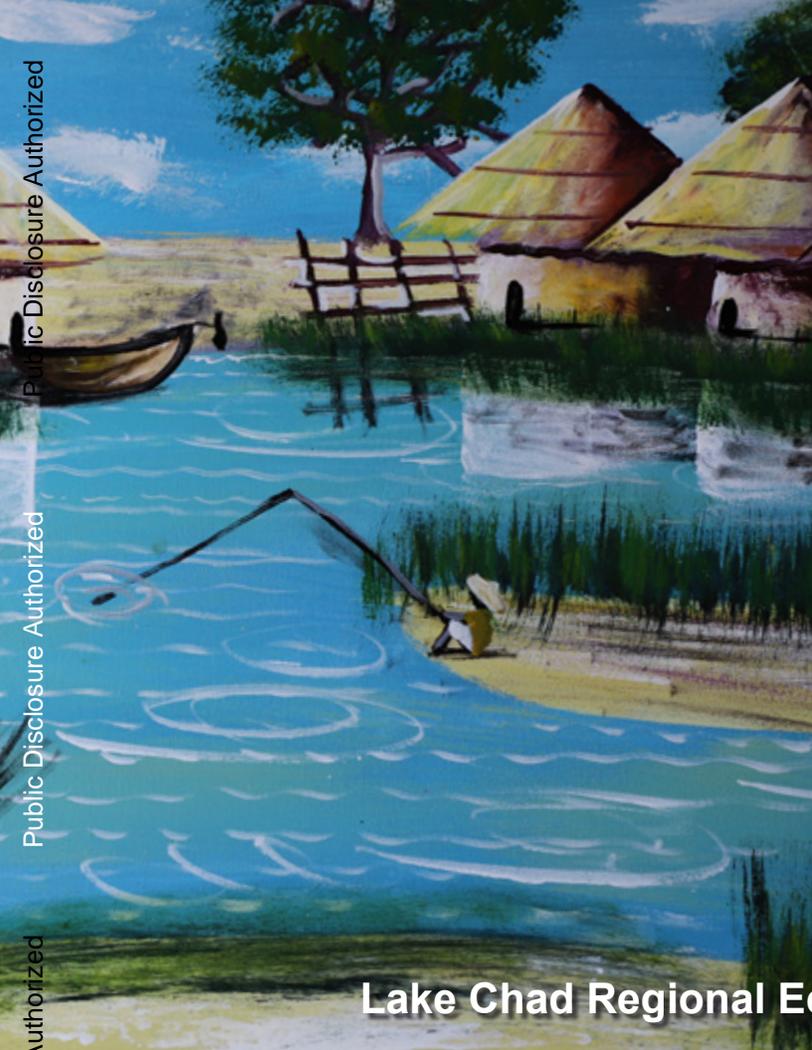


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Lake Chad Regional Economic Memorandum

Development for Peace



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Lake Chad Regional Economic Memorandum

Development for Peace

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Executive Summary

The context of the Lake Chad Regional Economic Memorandum: Understanding underdevelopment.

The Lake Chad region is an economically and socially integrated area located in west-central Africa. Spanning Cameroon, Chad, Niger, and Nigeria, this semiarid region faces a combination of long-term, structural barriers to development, layered on top of which are a complex set of exacerbating, near-term problems. The result is a situation of acute fragility that is trapping the region's 30 million inhabitants in a vicious cycle of low growth and endemic poverty. In turn, these conditions are fueling violence, conflict, emigration and displacement, land degradation, youth alienation, and a general sense of dissatisfaction with government institutions. In a region with limited traditional data, this memorandum presents new quantitative and qualitative evidence by integrating and leveraging existing population censuses, household surveys, administrative data, and information derived through the application of big data techniques to previously untapped datasets, such as nighttime light intensity, remote sensing data, and other geolocated data. This research offers valuable new insights on the nexus between suboptimal territorial development, on one hand, and climate change and conflict, on the other.

Development in the Lake Chad region is not only limited, but has shown few signs of historical improvement. The metrics of the socioeconomic development of the region paint a challenging picture. The region is characterized by high rates of poverty, low human capital, and poor access to key services. In the last three decades, economic activity and household incomes have been decreasing. The region has one of the highest population growth rates in the world, and fertility rates average around 5 children per woman. Communities in the vicinity of the lake are lagging compared with the socioeconomic standards in other parts of Cameroon, Chad, Niger, and Nigeria, which are already underperforming compared with other developing economies worldwide. For instance, in Nigeria's North East, which flanks the lake to the southwest, poverty rates are estimated at over 70 percent, almost double the rate in the rest of the country.

The underdevelopment or lagardness of the Lake Chad region is best understood as an agglomeration of interconnected factors.

This memorandum identifies and examines the interplay within and among long-standing structural factors (such as weak governance, lack of access to basic services, limited market accessibility, limited connective infrastructure, and socioeconomic exclusion), as well as with two exacerbating factors that have become more prominent in recent decades: violent conflict and climate change. The report then seeks to show the interconnections between these two distinct sets of challenges, namely, the long-term and structural challenges on the one hand and the more recent exacerbating factors on the other. The use of a spatial lens reveals a more granular and nuanced picture of the poverty trap in which the Lake Chad region has been caught. This opens the door to holistic policy recommendations, holding out the hope that the vicious cycle of suboptimal development and fragility in which the region is currently caught can be broken and replaced with a virtuous circle of economic growth, job creation, and poverty reduction.

Three Ds help explain territorial development: distance, density, and division.

In line with the interrelational nature of the Lake Chad region's underdevelopment, this memorandum adopts a cross-cutting approach to the analysis of the territorial hurdles faced by businesses and individual economic agents in the region. The first of the three spatial lenses the report adopts is *density*, which, as applied here, is defined as the economic mass or output per unit of land area (often measured as gross domestic product [GDP] per square kilometer). Economically active urban settlements are generally taken as a strong indicator of density (and growth potential). However, the Lake Chad region is lacking in this element. Except for the cities of N'Djamena in Chad and Maiduguri in Nigeria, which, together, account for around two million inhabitants, the vast majority of urban settlements in the region have fewer than 20,000 people. Rural migration is an ongoing trend in the region, and, because people are being displaced by conflict, the region has witnessed refugee urbanization rather than urban dynamism. The second lens is *distance*, which is the ease or difficulty of transporting goods, services, labor, capital, information,

and ideas between two locations. The Lake Chad region's record is weak on this measure. For instance, nearly two-thirds of the region's rural population live more than two kilometers from an all-season road. Couple this with low phone and internet connectivity, plus limited access to electricity and other basic services, and the effect on development is highly prejudicial. Completing the 3Ds is the concept of division, which is defined in both physical and social terms. *Division* captures tangible barriers to growth, such as crossborder trade restrictions, and differences in access to services and economic opportunities across population groups such as based on sex, age, economic activity (for example, between pastoralists and farmers), as well as displaced individuals and other vulnerable groups. The effect of each of the 3Ds alone is a serious impediment to growth, but, together, they make up a major derailment along the track to the inclusive growth of the Lake Chad region. Thus, this memorandum not only analyzes these three factors on their own, but also the interplay among them.

Two Cs—climate change and conflict—are exacerbating the region's fragility. The memorandum also focuses on two interrelated factors that are deepening underdevelopment in the Lake Chad region. The first is *climate change*, a worldwide phenomenon that presents significant, immediate, and unique challenges among people living in the vicinity of Lake Chad, at the center of the Sahel. Across the Sahel, temperatures are rising 1.5 times more quickly than the global average, leading to hotter general conditions and more erratic weather patterns. Droughts have become more severe and more recurrent in recent decades. The variability in the size of the lake—which shrank between the 1960s and the mid-1990s, but has been recovering since then—has affected livelihoods. Given that the region's agriculture is almost exclusively rainfed, the rise in temperatures is associated with major issues in food security and the incomes of farmers and herders. A second factor that is intensifying fragility is represented by *violence and conflict*, notably, the destabilizing activities of Boko Haram, a militant insurgency group that emerged in Nigeria in 2009 and then spread to the other three countries in the Lake Chad region. Between 2009 and 2019, conflict in the region led

to the displacement of an estimated 2.7 million people. In total, about 12.8 million people need humanitarian assistance. Nigeria's North East has been particularly badly affected. As with the 3Ds, the 2Cs feed into each other. The reduction in yields and farmer incomes caused by deteriorating climate conditions is lowering the opportunity costs of participating in violence. Likewise, the rising levels of violence are impinging on the capacity of governments to undertake climate mitigation and adaptation measures. A positive temperature anomaly of one standard deviation increases annual conflict events in the region by 17.6 percentage points. Similarly, conflict events in the Lake Chad region rose by an average of 8.9 percentage points in response to a negative anomaly of one standard deviation in a district's degree of greenness. Moreover, the impact of climate on conflict is strongest in areas that are largely agrarian and more densely populated.

The policy response needs to reflect the recognition that the development challenges in the Lake Chad region are interconnected. Given the extent of the region's socioeconomic challenges, a big push is required in policies and programs that can effectively promote territorial development, while addressing the drivers of fragility. This will require a strong consensus and prioritization of measures at the community, local, state, national, and regional levels. Measures aimed at tackling the region's challenges in isolation are not likely to result in sustained progress. An implication of the analysis in this memorandum is that an approach focusing on holistic policy levers represents the best chance of breaking the region's vicious cycle of suboptimal development and fragility. As exemplified by the analysis of the 3Ds and 2Cs, the factors behind Lake Chad's stubbornly high poverty rates are intimately interlinked and profoundly self-perpetuating. For instance, weak connective infrastructure (large distance) is shown to link to smaller economic agglomerations (low density), which reduces opportunities for trade and social dialogue and inclusion (high division). As all of this plays out against the backdrop of climate shocks and violent conflict, the vicious cycle is reinforced dangerously.

This memorandum concludes with policy options in four cross-cutting areas: infrastructure, trade, governance, and natural resource management. First, investing in infrastructure would help close connectivity gaps in the Lake Chad region, leading to higher productivity and better-quality jobs, particularly in rural areas. Important steps include improving road connectivity between cities and rural areas, expanding the delivery of basic services, and promoting digital infrastructure. Second, enhancing trade and regional integration would serve to reduce distance and division, leading to stronger agricultural value chains, higher incomes, improved food security, and greater stability. Promoting fishing and fish trading would be a timely step, as would be the gradual facilitation of crossborder trade, including through tariff harmonization (by taking advantage of the opportunities inherent in the Africa Continental Free Trade Area) as well as the visa-free movement of people. Third, strengthening the rule of law and the functioning of institutions through enhanced governance at the community, local, national, and regional levels are crucial for promoting the better delivery of basic services, which in turn are pivotal to address persistent gaps in human capital outcomes, to mitigate the devastating effects of violence conflict on lives and livelihoods, and to promote social inclusion. Improving coordination between federal and subnational governments, mobilizing domestic revenues more effectively, improving data for evidence-based policy making, and investing in local government capacity is vital to restoring a positive government presence in the Lake Chad region, as are measures to restore social cohesion and trust between citizens and the state. Fourth, the report recommends a renewed focus on natural resource management, including efforts to strengthen the sustainability of food systems and more effective land and water management practices suited to local agroecological conditions. This would require a solid regulatory environment and targeted support for producers, such as through the provision of credit, inputs, and extension services, as well as investments in technological innovation and knowledge transfers. Given the key coordinating role of the Lake Chad Basin Commission (LCBC), improvements to the organization's operating capacity are also a priority.

Pathways to development and peace. The policy levers highlighted in this memorandum are associated with elements of the 3Ds and 2Cs and have the potential to halt and reverse the self-reinforcing negative feedback loops of the vicious cycle. The goal is to inform the policy debate and build a consensus for integrative measures that will enable greater local density in economic production (by agglomerating labor and capital), reduce the distance to leading areas (increasing the flow of capital, labor, goods, and services), and lower divisions (causing living standards to converge), while addressing the conflict head-on (consequently increasing economic integration) and mitigating climate change (making income-generating activities more productive and resilient). A holistic agenda of this nature presents an immediate and realistic opportunity to break the Lake Chad region's cycle of underdevelopment and fragility and kickstart a positive cycle of more inclusive and resilient economic growth that is supported by broad societal consensus, high-level political commitment, and strategic and sustained policy implementation.

Part I: Overview of the Lake Chad Regional Economic Memorandum

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Takaaki Masaki (World Bank), and Carlos Rodríguez-Castelán (World Bank)

1.1 Introduction

1.1.1 Rationale

The region is noteworthy for important archaeological discoveries, its role in trans-Saharan trade, and its association with historic African kingdoms...

The Chad basin contains the earliest evidence of hominin occupation yet found in western Africa. Gritzner (2021)

The Lake Chad region is an economically and socially integrated area straddling four countries in West and Central Africa, namely, Cameroon, Chad, Niger, and Nigeria. The lake is situated in an interior basin, which was formerly occupied by a much larger ancient sea, sometimes referred to as Mega-Chad.¹ The region appears to have been continuously settled since 500 BCE.² Today, many social and economic indicators confirm that the area is a lagging region, though its rich natural resources and young population point to untapped economic potential. The Lake Chad region is a geographical crossroad and an epicenter in terms of the cultural, historical, and sociological characteristics of the local communities in the area. The historical economy of traditional livelihoods and trade around the lake has traditionally been mobile and crossborder. Despite the heterogeneity of structural factors in the basin countries, the crossborder movement and trade across the basin and the cultural ties and common identity in the area translate it into a distinct region. This region is currently facing shared security, economic, and climatic troubles.

An estimated 30 million people live in the Lake Chad region.³ The area consists of 10 national regions: the Far North Region in Cameroon; the Chari-Baguirmi, Hadjer-Lamis, Kanem, and Lac regions in Chad; the Diffa and Zinder regions in Niger; and Adamawa, Borno, and Yobe states in Nigeria (see Map 1.1 and Map 1.2). The majority of the labor force is occupied in primary sector activities—mostly agriculture, cattle herding and fishing—and indirect employment in related activities, such as trade, transport, and manufacturing. These economic activities contribute to jobs and food security among residents in the lake’s hinterlands and linked to the two regional metropolises with seven-digit populations: N’Djamena, the Chadian capital, and Maiduguri, the capital of Borno State in Nigeria.

The population in the Lake Chad region is growing at a rapid pace, putting additional pressure on the limited resources and basic services. Fertility rates are high, and the total population in the Lake Chad Basin countries is projected to double over the next 25 years.⁴ High population growth poses challenges in access to basic services, such as electricity and piped water; where access rates are already among the lowest in the region, with implications for human capital. Literacy and completion rates in primary education in the areas around the lake are significantly lower than in the rest of the respective countries. Furthermore, rather than converging, the gap in access to core services has been widening between the Lake Chad region and other parts of the countries.

Lagging in social and economic indicators, the Lake Chad region is characterized by weak territorial development. Compared with other parts of the basin

1 Gritzner (2021).

2 Ibid.

3 World Bank calculations based on the proposed administrative definition of the Lake Chad region, Linard et al. (2012), and remote-sensing data of Population Counts (dashboard), WorldPop, University of Southampton, Southampton, UK, <https://www.worldpop.org/project/categories?id=3>.

4 UNFPA (2017). The term Lake Chad Basin countries is used indistinguishably with Lake Chad region countries throughout the report to denote the four countries of the study: Cameroon, Chad, Niger and Nigeria.

countries, the Lake Chad region exhibits significantly higher poverty rates, chronic human capital deficits, and a historical lack of access to basic services and infrastructure. It has experienced little economic progress over the past three decades. The declining water level of the lake until the mid-1990s pushed people to migrate from rural to urban areas (although, since then, the water level has been recovering). Currently, the region is characterized by widening spatial gaps because urban agglomerations in the region are growing more quickly than rural areas. Rural areas have limited access to connective infrastructure; people are twice as likely to be disconnected from main roads and thus from access to markets and economic opportunities. In both urban and rural settings, women, youth, displaced persons, and other vulnerable groups face unequal access to services and to income-generating activities.

The long-term suboptimal territorial development challenges are exacerbated by the interplay of conflict and climate change. Ten years of conflict, driven by the Boko Haram insurgency, have left an estimated 12.8 million people in need of humanitarian assistance in the Lake Chad region, 2.7 million of whom are people displaced by the conflict.⁵ Human displacement and the disruption of markets and value chains because of the physical destruction of facilities and direct threats against traders have resulted in loss of productive assets and inputs. While the region has traditionally been a commerce hub connecting the four basin countries and providing ties with North Africa, crossborder trade and economic activities around Lake Chad have also been disrupted by the Boko Haram conflict. Counterinsurgency measures, such as border and road closures, restrictions on farming and fishing, and the movement of goods and people, have also put a damper on economic activity.⁶ The intensity of fighting has tapered off in recent years, but the conflict has spread from its original location in Nigeria's North

5 Of the 12.8 million people in need of humanitarian assistance, 10.6 million are in the three most highly affected states, Adamawa, Borno, and Yobe, in Nigeria's North East (USAID 2020).

6 UNDP and OCHA (2018).

Map 1.1: Lake Chad area



Source: Magrin, Lemoalle, Pourtier, 2015. *Atlas du lac Tchad*.

Source: Magrin et al. 2015.

Map 1.2: Administrative definition of the Lake Chad region



Sources: Masaki and Rodríguez-Castelán 2021; data of GADM Database of Global Administrative Areas, Environmental Science and Policy, University of California, Davis, CA, <https://gadm.org/>.

East and currently affects all four countries surrounding Lake Chad.⁷

In addition, climate change is increasingly becoming a significant risk to livelihoods and food security across the region. Rising temperatures and increasingly erratic rainfall patterns have rendered precarious the livelihoods of farmers and fishers who rely critically on uncertain water resources. Moreover, the greater frequency of climate anomalies (e.g., rainfall shortages, rising temperatures, and aridification) has been associated with a rise in conflict activities in the region.

The effects of conflict and climate change are painfully visible through remote-sensing technology. The economic effects of conflict can be seen from outer space. Areas directly or indirectly affected by Boko Haram are experiencing slower rates of growth (measured by nighttime lights). There is evidence of spillover effects. Thus, even at a time when Boko Haram activity was only occurring in Nigerian territory, it was possible to observe the negative effects on the neighboring countries of Cameroon, Chad, and Niger. There is also evidence of the long-term negative effects of climatic factors on population growth and economic agglomeration. As a result of the shrinkage of Lake Chad between the 1960s and the 1990s, areas near the lake experienced substantially slower population growth, particularly in Cameroon and Niger. This is likely explained by the loss of economic opportunities, including because the receding lake offered less irrigation for agriculture and cattle herding and lower incomes from fishing. Since the late 1990s, the level of the lake has been recovering.

This project helps close a critical knowledge gap by identifying opportunities to promote sustainable and inclusive economic growth in the Lake Chad region. Existing policy research is extremely thin. The report

draws insights from seven original technical papers that speak to different facets of the interlinked developmental challenges in the region.⁸ Given the limited availability of rigorous economic studies in the area, this research helps bridge an important knowledge gap. A better understanding of the interlocked challenges and mechanisms that have trapped the region in a low-growth, high-poverty equilibrium is essential to identifying policy instruments to improve service delivery, provide stability, and strengthen economic opportunities.

One of the main contributions of this Lake Chad Regional Economic Memorandum (LCREM) is the definition of a novel analytical framework to elaborate a comprehensive diagnostic of territorial development challenges in the presence of conflict and climate change. The proposed analytical framework captures the vicious cycle between suboptimal territorial development in the region and the systemic risks associated with the violent conflict and climatic shocks that the region faces and that negatively affect development outcomes. The framework helps identify policies with the potential to improve territorial development and reduce violent conflict and fragility, thereby allowing developing regions to escape the self-perpetuating vicious loop that makes them diverge from their long-term potential.

Another key contribution of this LCREM is the production of an innovative data-driven diagnostic on inclusive growth across the region in a context of limited data availability. The LCREM integrates both traditional and innovative sources of data to provide a rigorous economic analysis of the Lake Chad region. The ability to provide data-driven analysis is a particularly important feat, given that the data environment in the region is extremely poor. Primary data collection in the area is difficult because of tenuous security, access constraints, and—more recently—the COVID-19 pandemic,

⁷ The nature and frequency of violent events in Lake Chad Basin countries can be tracked through ACLED (Armed Conflict Location and Event Data Project) (dashboard), Robert S. Strauss Center for International Security and Law, Austin, TX, <http://www.acleddata.com/>; GTD (Global Terrorism Database), National Consortium for the Study of Terrorism and Responses to Terrorism (START), University of Maryland, College Park, MD, <https://www.start.umd.edu/gtd/>; UCDP (Uppsala Conflict Data Program) (database), Department of Peace and Conflict Research, Uppsala University, Uppsala, Sweden, <http://ucdp.uu.se/?id=1>.

⁸ See Appendix 1.C for a list of the technical papers prepared for this report.

which make in-person data collection unfeasible. In this particularly difficult data environment, the LCREM has performed extensive stocktaking and data-generation based on traditional sources of data, including household surveys, censuses, and administrative data, and new sources of data from satellite imagery and remote-sensing technology. This data collection and generation process has involved digitizing historical census population data dating back to the 1950s and standardizing and integrating existing micro-level household surveys available for the Lake Chad Basin countries. The new sources of data—remote-sensing and satellite data—leverage spatially and temporarily granular data on various development outcomes, including local economic activities (for example, nighttime lights), agricultural productivity, conflict, climate (rainfall, temperature), and infrastructure (roads, electricity, digital infrastructure).

The value of this LCREM also resides in its integral diagnostic of regional development challenges, focusing on a particular territory nested within several countries. Unlike a traditional Country Economic Memorandum (CEM) produced by the World Bank, which offers a country-level diagnostic of key development challenges and a policy agenda in a *single* country, this LCREM presents a comprehensive analysis of development challenges that are specific to the Lake Chad region. And it identifies policy directions that the Lake Chad Basin countries may pursue to facilitate their growth. This regional or territorial focus is unique and particularly important in framing current policy debates around inclusive growth because, around the world, poverty has become spatially concentrated and economic progress highly uneven across space.⁹ Unlocking economic opportunities for lagging regions thus entails regional interventions and coordination across different countries.

Given its novel framework and analytical approach in a context of limited data availability and its focus on a set of subregions across countries, this report represents a model for other, similar settings. Regions

around the world face a combination of territorial development challenges and a substantial risk of systemic shocks and are often caught in suboptimal equilibriums. The analytical framework and approach depicted in this LCREM, which explicitly address the feedback mechanisms among the challenges in a solution-oriented manner, can be useful beyond Lake Chad. It can help inform policy interventions in settings experiencing a similarly vicious cycle to identify challenges and opportunities for inclusive growth. In addition, because the characteristically limited data on the Lake Chad basin is also the typical setting of many lagging regions, the methods for data integration and analysis used in this report could also help inform evidence-based policy making in numerous data-poor areas.

1.1.2 Road Map of the Report

This report sheds light on the interlocked long-term territorial development challenges and the recently realized systemic risks affecting the Lake Chad region.

It summarizes the findings of seven technical papers, each investigating different aspects of the interlinked challenges faced by the region. These studies are accompanied by complementary research on labor market and geospatial socioeconomic trends, as well as by a review of the thin literature on economic development across the region. In addition to presenting the main results of the technical papers, the report positions the findings in the broader context of an analytical framework depicting the feedback mechanisms between the region's territorial development gaps and the self-reinforcing link to shocks, namely, violent conflict and climate change. **This analytical framework is presented in Section 1.2.** The rest of the report is structured as follows.

Section 1.3 describes the main social and economic trajectories in the region. It reviews long-term demographic trends—suggesting that population growth in the region is among the highest worldwide—and finds

9 See *World Development Report 2009* (World Bank 2009).

limited access to basic services in the areas surrounding the lake. Poverty and socioeconomic trends show that the region is lagging relative to other parts of the basin countries, and local economic dynamics indicate that the region has experienced little economic progress over the past decades. Agriculture is the main sector of economic activity in the Lake Chad region, accounting for the labor of a large share of young workers, as shown by the analysis of labor market data. Wage employment is limited, and the gap in the quality of jobs in the region extends into gaps by sex.

Section 1.4 argues that the low-growth, high-poverty equilibrium observed in the region is closely linked to the region's economic geography. A low degree of economic *density* (concentration of economic activity), in combination with great *distance* and wide *divisions* that limit the ease of movement of people, goods, capital, and ideas, appears to be derailing the region from a sustainable track of growth. The region shows low levels of density and urbanization, whereby urban agglomerations tend to grow more quickly than rural areas, with widening spatial gaps and a lack of regional convergence. Connectivity gaps limit access to markets and economic opportunities among people, particularly in rural areas, with implications for local economic development. Over the past 10 years, border closures in response to the Boko Haram conflict have limited mobility and the historically strong crossborder trade in the Lake Chad Basin. In addition to hampering trade, violent conflict has aggravated social exclusion in the region, curtailing access to services and income-generating opportunities, particularly among vulnerable groups. Violent conflict has driven the forced displacement of people in the region, resulting in one of the worst humanitarian crises in 2019.¹⁰

Section 1.5 discusses how the impact of climatic variation and violent conflict experienced in the region interlink with and exacerbate the territorial development challenges. Highly dependent on agriculture, the Lake Chad region is at particular risk

from harsh environmental conditions. The region has experienced a higher share of droughts compared with other areas in the basin countries, with implications for livelihoods and food security. More regular rainfall is associated with positive effects on local economic growth. The section also shows that climate anomalies, such as deteriorating vegetation, rising temperature, and erratic rainfall are closely linked with conflict events in the Lake Chad region, suggesting that there is a climate-conflict trap. Violent conflict has had significant negative economic effects in the region by disrupting trade and shattering agricultural production. The downturn in local economies is not only visible in the directly attacked areas, but has also spilled over to neighboring regions. The slump in economic activity is particularly harsh on less well developed and less well connected urban areas, highlighting the link among gaps in territorial development, conflict, and suboptimal development outcomes.

Section 1.6 presents policy directions structured around four crosscutting themes: infrastructure, trade, governance, and natural resource management. The crosscutting nature of these themes encourages the exploration of potential synergies across challenge areas. The discussion in the section aims to inform policy-making efforts to strengthen territorial development and mitigate the impacts of conflict and climate change. Such endeavors can increase the likelihood of breaking free from the self-reinforcing negative mechanisms and boost the potential return of the region to a path of stability and inclusive economic development.

¹⁰ OCHA (2019).

1.2 Analytical Framework

Socioeconomic and governance challenges across the region are interlocked with issues of fragility, conflict, and harsh environmental conditions, which have trapped the region in a low-growth, high-poverty cycle. The region faces multidimensional challenges related to weak governance, low human capital, limited market accessibility and economic opportunities, poor citizen security, regional instability, limited connective infrastructure, and engrained social exclusion.¹¹ The poor quality of services in the region has been exacerbated by the destruction of public and private infrastructure.¹² These mutually reinforcing challenges have resulted in a fragile region characterized by conflict and violence, endemic poverty, limited economic opportunities, especially among youth, land degradation, insecurity, and general dissatisfaction with public institutions. Climate change and demographic trends—the rapid growth and young age-structure of the population—amplify and exacerbate these threats. A lack of central government presence that predates the ongoing crisis, particularly in rural areas, has left a governance void in the region.¹³ Already weak, the social contract between citizens and the state has eroded in recent years, as governments are increasingly less able to provide basic public services in the region as a result of the widespread insecurity. This has reduced the trust of citizens in government, which also fuels the conflict, especially where a sense of exclusion exists.¹⁴ Armed rebel groups have taken advantage of this gap in governance, particularly in public service delivery, to provide valued

access to health care, food, religious education, and funding that is aimed at strengthening their position.¹⁵

This report proposes an analytical framework based on two main components: (a) a self-reinforcing link between suboptimal territorial development and fragility, conflict, and violence (FCV) and challenges relating to climate change and (b) policy instruments aiming at strengthening territorial development and mitigating risks. The report is guided by the analytical framework illustrated in Figure 1.1 that draws analytic elements from *World Development Report 2009: Reshaping Economic Geography* (World Bank 2009), *World Development Report 2010: Development and Climate Change* (World Bank 2010), and *World Development Report 2011: Conflict, Security, and Development* (World Bank 2011).¹⁶ Furthermore, this LCREM is aligned with the World Bank FCV strategy's two pillars of engagement: (a) preventing violent conflict and interpersonal violence and (b) mitigating the spillovers of FCV.¹⁷ The center of the illustration in Figure 1.1 helps explain the outcomes observed in the region, including low growth, high poverty rates, and a low human capital index. The framework depicts the feedback between suboptimal territorial development and systemic risks prevalent across the region, such as violent conflict, weather shocks, and resource scarcity. All these risks negatively affect development outcomes, which results in a vicious cycle. This negative feedback loop deviates lagging regions from their long-term economic potential, leading to lower

11 Such as exclusion from local decision-making processes and capture (of policies, services) by elites (World Bank 2018).

12 Al Jazeera (2017); Obi and Eboreime (2017). Further details available under the '3.4 Human capital outcomes and access to basic services' section, below.

13 Magrin and Perouse de Montclos (2018).

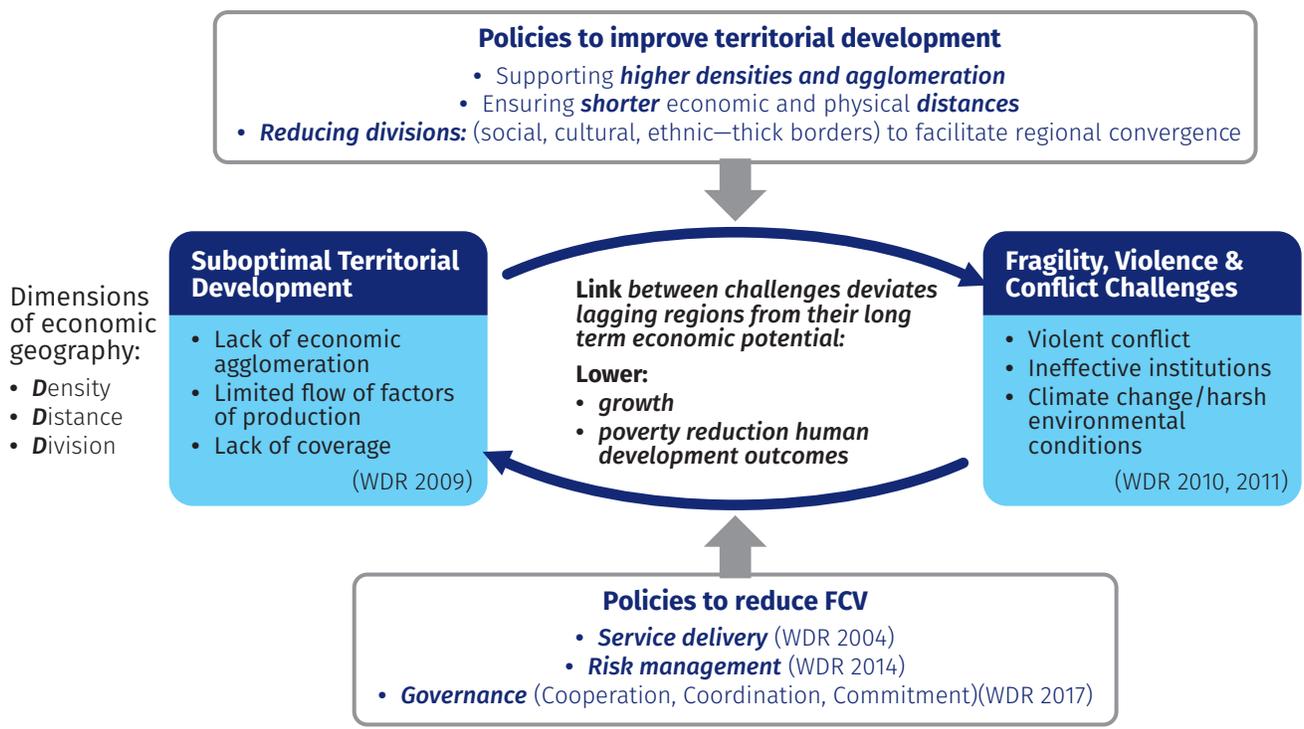
14 Magrin and Perouse de Montclos (2018). Horizontal inequalities—differences (real or perceived) in access and opportunities across groups—can create grievances among disadvantaged groups, making countries more vulnerable to conflict (United Nations and World Bank 2018).

15 Vivekananda et al. (2019). Local evidence suggests that the ISWAP faction of Boko Haram has sought to fill social service provision gaps and foster income-generation opportunities to try to win over Lake Chad Basin communities and secure its position. According to community members and security sources, ISWAP has set up state-like structures in the Abadam, Kukawa, Guzamala, Marte and Monguno local government areas in Borno State, north-east Nigeria (Samuel 2019).

16 The report is also informed by World Bank (2003, 2013b, 2017).

17 For more information, see World Bank (2020b).

Figure 1.1: Analytical framework to identify opportunities to strengthen territorial development and address fragility in the Lake Chad region



Source: World Bank elaboration based on World Bank 2003, 2009, 2010, 2011, 2013b, 2017.

growth, stagnant poverty reduction, and low human development outcomes.¹⁸ The policy framework (top and bottom of the figure) identifies policy options that can help strengthen territorial development and reduce FCV, helping the region break this vicious cycle.

Territorial development challenges are understood through three dimensions of economic geography, the three Ds: density, distance, and division. A low local *density* of economic production limits the efficient agglomeration of labor and capital and, thus, the potential for economic growth. Economic and physical *distance* to leading areas restricts the flow of capital, labor, goods, and services, and thus the opportunity for individuals and firms. Physical, sociocultural, ethnic, or other

thick *divisions* and borders curb convergence in living standards, including through the unequal coverage of basic services and by hindering the spread of the benefits of growth.¹⁹ Suboptimal development outcomes derived from low density, long distances, and thick divisions tend to exacerbate FCV challenges, low government capacity, and the scarcity of resources. These collectively create a negative feedback loop that leads to worsened development outcomes.

Territorial development challenges often intersect with challenges related to the two Cs—conflict and climate change—thus exacerbating the gap between lagging and leading areas. Areas with low economic density (insufficient agglomeration to foster economies of

18 Given data constraints, alternative variables may be used as a proxy to illustrate these indicators; e.g. using nightlights as a proxy of economic growth, living standards for poverty reduction and malaria incidence for human development to show how due to challenges and shocks these indicators deviate from their optimal trajectory.

19 While the inverse—active crossborder dynamics, trade and mobility—can be a factor of resilience.

scale in production) and high unemployment tend to be a fertile ground for illicit activities and violence.²⁰ Enforcing the rule of law in areas distant and disconnected from markets is also more difficult for governments that are limited in reach or lack relevant incentives. Violent conflict often leads to an overall increase in transaction costs, which raises physical and economic distance to markets. Divisions also aggravate distance. For example, differences in language, place of origin, and ethnicity are magnified by conflict over scarce resources and constitute strong barriers to internal migration.²¹ Economic distance, meanwhile, limits economic opportunities and employment among a population, particularly among young people. This lowers the cost of engaging in illicit economic activities and violent behavior. Rebellion is often perceived to offer a viable living to followers who have no other source of livelihood.²² Violent regions, for their part, tend to exhibit high levels of corruption, weak rule of law, and ineffective institutions, all of which make them less successful at attracting economic activity. This demonstrates the close link between violence and economic isolation. Shocks to the system, such as violent conflict arising from adverse environmental conditions because of human activity or from pandemics, can limit the flow of capital and labor, affecting income-generating activities and leading to lower growth and higher poverty rates.

Conflict and climate change pose challenges to household access to basic services and the ability of households to accumulate and use productive assets.

Violent conflict in affected regions tends to interrupt public service provision or even render it impossible and typically leads to the depletion of household productive assets. It often also results in the forced displacement of people, including over national borders, and the

deterioration of infrastructure, further interrupting access to services and the erosion of assets. The inability to use assets productively and to access services can deepen existing divisions and frictions among groups.

Fragility and conflict pose challenges for public and private investment.

This increases economic distance and lowers economic density, leaving affected areas increasingly isolated.²³ Discrimination can likewise be reinforced by profound divisions, such as the social or political differences associated with persistent disparities in living standards. Unequal social and economic opportunities and the public perception of such inequality can adversely affect social cohesion by deepening grievances and feelings of exclusion and marginalization, which, if unaddressed, can lead to tensions and sometimes turn into violent mobilization. Additionally, climate change and harsh environmental conditions can limit opportunities in lagging areas, aggravating existing problems and perpetuating disparities. Lagging areas that face difficult climatic conditions, lack access to basic services, and experience poor governance in a region affected by insurgencies and conflict are often burdened by violence. Lagging regions—lacking access to basic services and the ability to use assets productively and subject to suboptimal economic and social development outcomes—are thus as much a driver as a consequence of FCV, in a vicious cycle that makes escaping the fragility trap difficult for countries.

Guided by this analytical framework, the next sections synthesize the previous literature and policy reports, while also drawing on original policy research prepared for this Regional Economic Memorandum that contribute new knowledge on the trends and drivers behind the region's low economic growth and high poverty rates.

20 Unemployment and idleness are cited as the most important factor motivating young people to join rebel movements in areas affected by violence, according to the 2011 Conflict, Security, and Development World Development Report. At the same time, the relationship between unemployment and violence has not been established as clearly through econometric analysis, likely due to poor data and/or because the link is indirect rather than direct (World Bank 2011).

21 World Bank (2009). A study of 11 Sub-Saharan countries showed that, while ethnicity was a strong predictor of differences in under-5 mortality, if combined with geography, it predicted the probability of survival among children (Brockerhoff and Hewett 2000).

22 World Bank (2011).

23 Isolation tends to result both in divided identity groups and in marginalization, as well as fewer economic opportunities. For example, the average GDP per capita of all landlocked developing countries is three-fifths that of their maritime neighbors (World Bank 2011).

1.3 Recent Socioeconomic Trends in the Lake Chad Region

1.3.1 Long-Term Demographics

Poverty rates, economic growth, and other core socioeconomic indicators in the Lake Chad Basin trail the indicators in other areas of the countries.

Population growth in the Lake Chad Basin countries is among the highest worldwide. The population of Cameroon, Chad, Niger, and Nigeria is forecast to double over the next 20 years. The Lake Chad region had an estimated increase in population by 14 million between 2000 and 2020.²⁴ While significant progress is being made in other regions of Africa, countries in the Lake Chad Basin are still lagging in the demographic transition. Indeed, the classic pattern of demographic transition—a significant decline in under-5 mortality leading to a sharp drop in fertility—has not yet unfolded in the Lake Chad Basin countries. The average number of children per woman in most Lake Chad Basin countries remains high, at close to or above five children per woman, with no signs of a significant decline.²⁵ Fertility rates are higher in the lake area than in the rest of the corresponding countries. For example, the areas of Cameroon and Nigeria that surround the lake present rates of 6.8 and 5.8 children per woman, respectively, compared with 4.8 and 5.3 children per woman in the rest of these two countries. In Niger’s Diffa and Zinder regions, fertility rates are even higher, at 8.2 children per woman compared with 7.5 children per woman in other parts of the country. The

Lac and Hadjer-Lamis regions of Chad are the exception: the average fertility rate is slightly lower than the average in other parts of the country (6.2 versus 6.5 children per woman, respectively).²⁶

Some of the critical drivers behind demographic shifts in the Lake Chad region are related to climate and environmental factors. In the 1970s, the Sahel experienced severe droughts that strained the livelihoods of agriculturalists and pastoralists across a vast area. The droughts reduced water levels dramatically, dividing Lake Chad into two separate bodies of water, the northern and southern pools. By the 1980s, the water area had shrunk to 2,000 km² (from 25,000 km² in the 1960s). NASA satellite pictures reveal a clear deterioration in the lake’s surface area, decreasing by approximately 82 percent since the 1960s (Map 1.3).²⁷ The droughts drove some people from the region to migrate toward the lake. Some moved to the lake’s shore, but most chose to migrate to the numerous islands in the lake for their fertile farmland, fishing opportunities, and pastures.²⁸

The historical population growth in the Lake Chad region is rapid, but not especially more rapid than in the other parts of the countries. An analysis of historical population census data tracking total and urban population patterns at a fine spatial level from the 1960s to the 2010s in three of the four Lake Chad Basin countries—Cameroon, Chad, and Niger—shows how demographic dynamics have shifted in areas near the lake.²⁹ A simple comparison of the annual population

24 World Bank calculations based on 2020 data of Population Counts (dashboard), WorldPop, University of Southampton, Southampton, UK, <https://www.worldpop.org/project/categories?id=3>.

25 See <https://wcaro.unfpa.org/en/publications/demographic-dynamics-and-crisis-countries-around-lake-chad>.

26 Data on total fertility rates come from the latest Demographic and Health Surveys available in each country: Cameroon, 2018; Niger 2012; Nigeria, 2018; and Chad, 2014.

27 It has been estimated that Lake Chad lost about 90 percent of its surface water area (around 23,000 sq. km) between the mid-1960s and the mid-1990s. While its water level has been slightly recovering since the mid-1990s, it is still on average 80 percent less than it was in the mid-1960s.

28 See Vivekananda et al. (2019).

29 Nigeria was excluded from this analysis because of a long history of disputed census results. The results presented in this section are taken from Jedwab, Haslop, et al. 2021, technical paper for this report.

growth rate between the Lake Chad region and the other parts of the countries reveals that population growth in the two areas is roughly the same. In Cameroon, the annual rate of population growth in the Lake Chad region between 1956 (the earliest year of census data availability) and 2005 (the latest census year) is 2.8 percent, which is slightly lower than the rate in the rest of country (3.2 percent). In Chad, the annual population growth rate of the Lake Chad region between 1948 and 2009 (3.2 percent) exceeded the rate in the rest of the country (2.6 percent), whereas, in Niger, these numbers are

roughly the same (around 3.5 percent for both the Lake Chad region and rest of the country between 1951 and 2017).

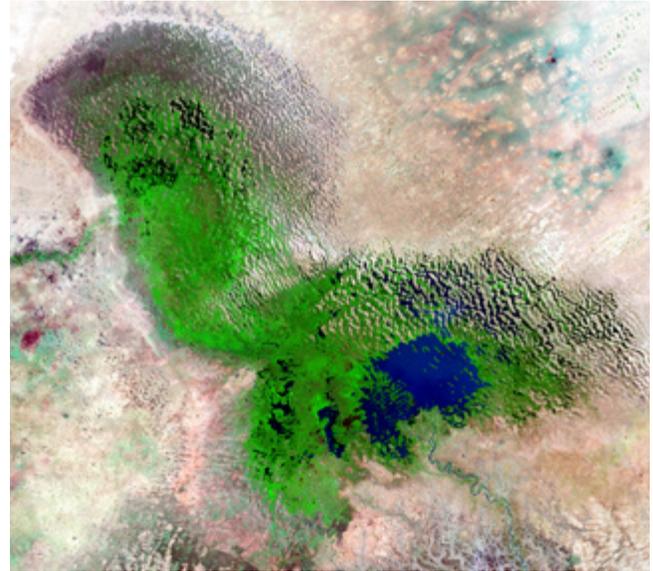
The shrinkage of Lake Chad between the 1960s and mid-1990s—the level has been recovering since then—posed downward pressure on population growth in areas proximate to the lake. This effect was particularly pronounced in Cameroon and Niger, where areas close to the lake saw as much as a 40 percent relative slower growth in population. One explanation for this

Map 1.3: The evolution of Lake Chad

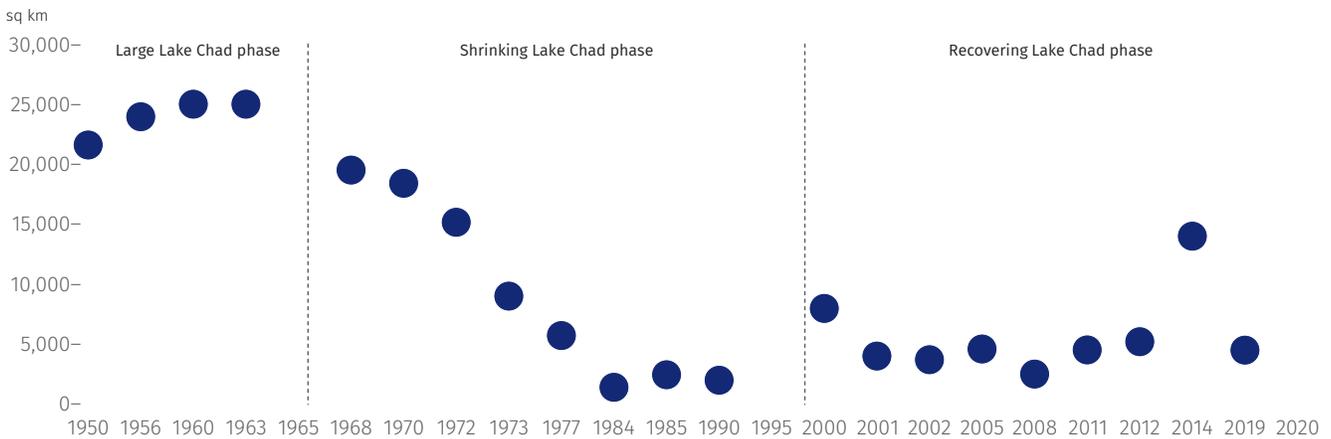
a. Satellite imagery, 1972



b. Satellite imagery, 2018



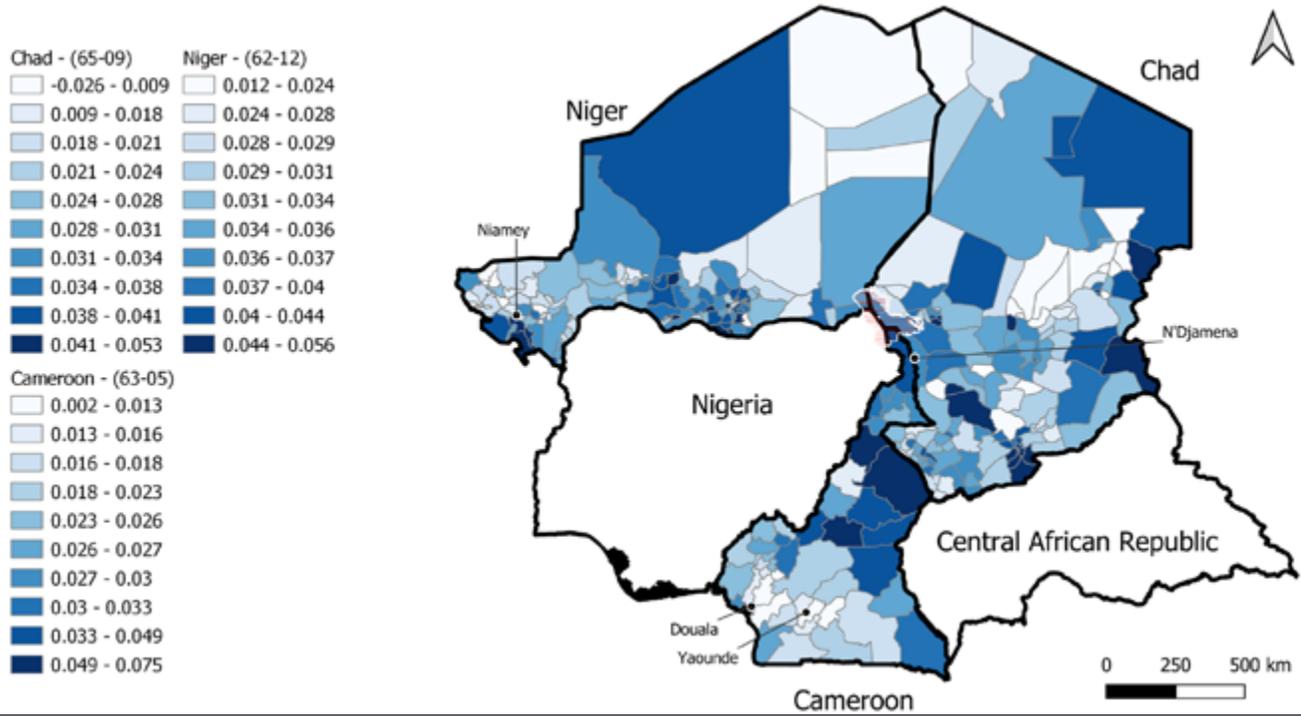
c. Total water surface, 1950–2020



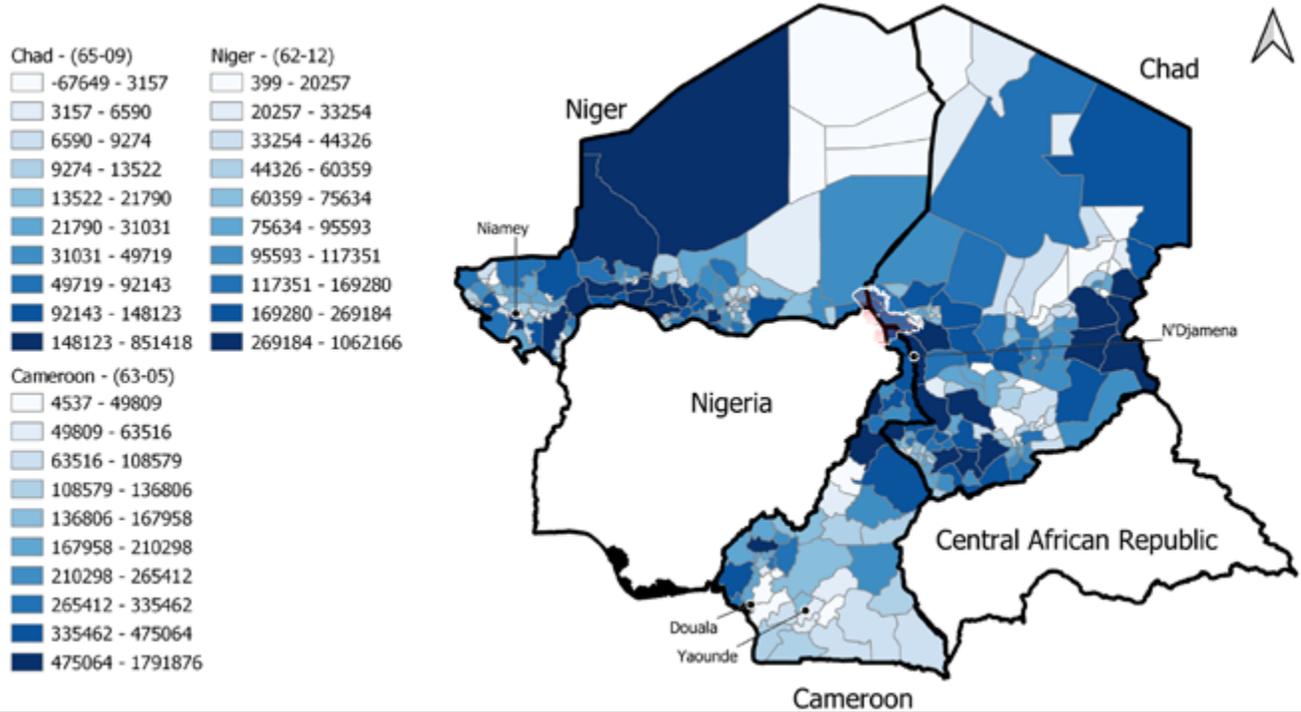
Sources: Panels a and b: UNEP/DEWA/GRID Geneva, based on NASA's satellite images. Panel c: Olivry et al. 1996; S'edick, no date; FAO 2009; LCBC 2015; Okpara et al. 2016; Ighobor 2019.

Map 1.4: Historical map of population growth, Lake Chad Basin countries, 1950s–2010s

a. Annual growth rate in population



b. Absolute change in population



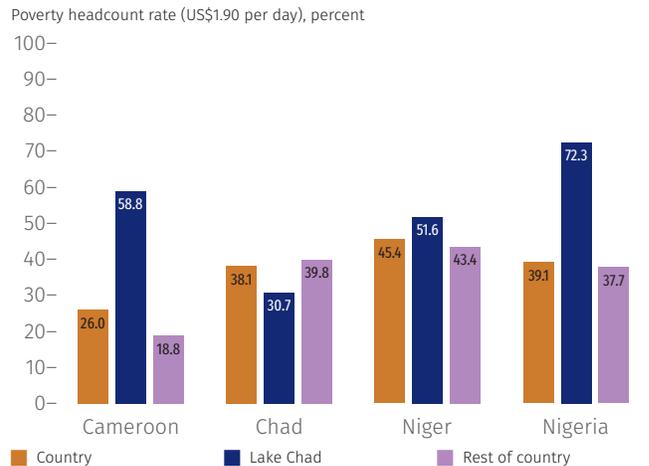
Source: Jedwab, Haslop, et al. 2021, technical paper for this report.
 Note: This figure shows the annual population growth rate and absolute change in the size of population by historically consistent subdistrict boundaries reconstructed for Cameroon, Chad and Niger. Nigeria is not included because of data limitations. These three countries are divided into 113, 138, and 119 subdistricts, respectively. Lake Chad is shown in the center of the map.

relationship may be the loss in economic opportunities. As the water level receded between the 1960s and the mid-1990s, the lake shore moved farther from cultivated land, increasingly limiting irrigation possibilities. A smaller lake also reduces incomes in fishing communities. It can likewise impact cattle herding (requiring proximity to the water and vegetation around the lake), an important sector in the Lake Chad region, where herders typically sell their cattle to urban markets in Nigeria. Recent years have seen signs of the lake water level resurging from its lowest level (roughly 2,000 km²) in the 1990s to roughly 14,000 km². It remains to be seen whether this resurgence in the water level will attract more people into the basin areas by generating new economic opportunities.³⁰

1.3.2 Trends in Poverty Reduction

Given its high poverty rate, low human capital, and poor access to key services, the Lake Chad region is characterized as a lagging region. An analysis of the most recent household surveys available for each country shows that households in the Lake Chad region are poorer compared with households in neighboring regions (Figure 1.2).³¹ The regional poverty rate in the Far North Region of Cameroon (59 percent) is three times higher than the rate in the rest of the country (19 percent). In Nigeria, the poverty rate in the Lake Chad region (72 percent) is nearly twice as high as the rate in the rest of the country (38 percent); part of this spatial gap is likely explained by the devastating impact of the Boko Haram conflict in Nigeria's North East.³² Chad is the only exception. There, the poverty rate in the country's Lake Chad region (31 percent) is lower than the rate in the rest of the country (40 percent).³³ This is explained by the fact that the areas in Chad around the lake are near the capital of the country, with a consequently higher urbanization rate and a relatively high population density.

Figure 1.2: Poverty is more severe in the Lake Chad Basin than in other parts of the countries



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.
 Note: Data on poverty are based on the latest household surveys conducted in Cameroon (2014), Chad (2011), Niger (2014), and Nigeria (2018). Rest of country = outside the Lake Chad region; LCB = within the Lake Chad Basin region.

There is also a significant spatial gap in poverty *within* the Lake Chad region. Poverty is most prevalent in the parts of the Lake Chad region that lie within Nigeria. The poverty rates in Adamawa and Yobe states reach as high as 74 percent and 70 percent, significantly higher than the national average of 38 percent (Map 1.5, panel b). These regions are also home to the largest number of the poor in the Lake Chad region (Map 1.5, panel c). Kanem Region in Chad has the lowest poverty rate (19 percent) across the Lake Chad region.

Not only is the level of poverty high in the Lake Chad region relative to the other parts of the countries, but the pace of poverty reduction in the region is slow. There is little sign that the spatial gap in poverty between the Lake Chad region and neighboring regions is narrowing. In Cameroon, for instance, poverty declined by 4 percent in the Far North Region compared with a 6 percent decrease in the rest of the country between 2007 and 2014. While Niger as a whole saw a reduction in poverty from 51 percent to 45 percent between 2011

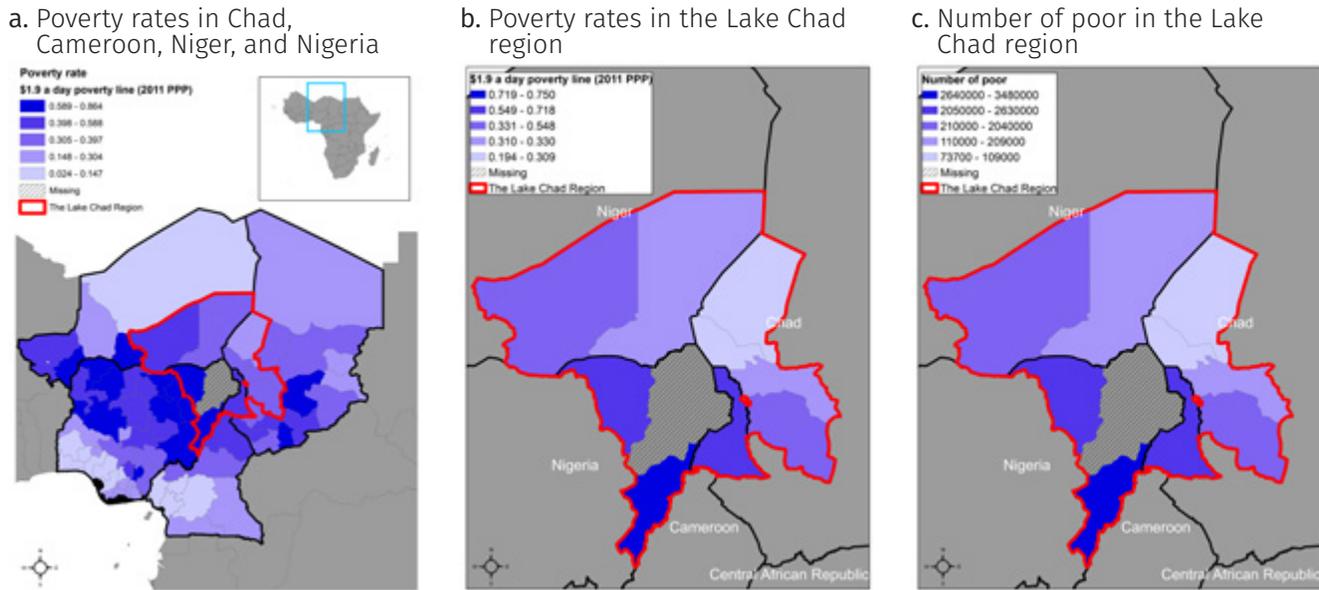
30 Vivekananda et al. (2019).

31 The results presented in this section are drawn from Masaki and Rodríguez-Castelán (2021), technical paper for this report.

32 The country's Borno state is excluded from the analysis given that there is no representative household survey for that state.

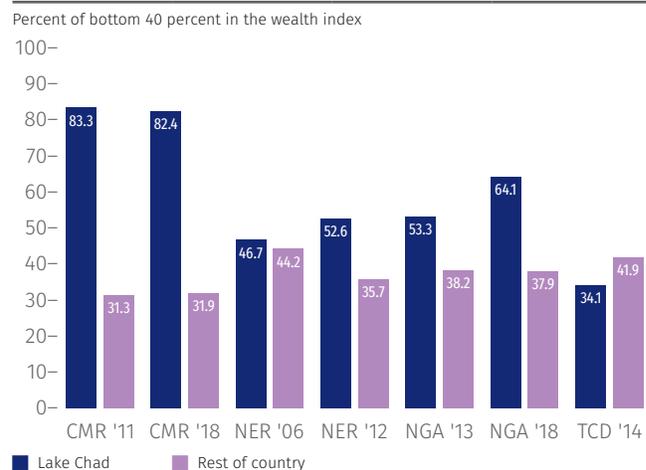
33 Mahmood and Ani (2018).

Map 1.5: Poverty in the Lake Chad region



and 2014, the Lake Chad region in Niger experienced a slight *increase* in poverty, from 48 percent to 52 percent. This pattern of nonconvergence in welfare and poverty is corroborated by data on the ownership of assets and how they have changed in the Lake Chad region. The share of households that are relatively asset poor—or in the bottom 40 percent of asset wealth distribution in a given survey by country and year (the bottom 40)—shows no clear sign of convergence between the Lake Chad and non-Lake Chad areas of each country (Figure 1.3).³⁴ For instance, in Niger and Nigeria, the share of asset-poor households increased in the Lake Chad region, while, in Cameroon, the share remained almost unchanged between the two latest rounds of the Demographic and Health Surveys. These findings suggest that wealth gaps between the Lake Chad region and the rest of the countries may have worsened.

Figure 1.3: Asset deprivation in the Lake Chad Basin versus other parts of the countries



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.
 Note: Data based on the latest two rounds of Demographic and Health Surveys in each country. CMR = Cameroon. TCD = Chad. NER = Niger. NGA = Nigeria. The year refers to the year the survey was conducted.

³⁴ The wealth index was constructed for the latest two Demographic and Health Surveys in each of the Lake Chad Basin countries. Our wealth index is a composite measure of various household assets, including housing materials, access to electricity, cooking fuel, access to improved water, as well as ownership of various items such as televisions and bicycles. We applied a principal component analysis to generate the composite index. To make our wealth index comparable over time within the same country, we applied the same coefficients for use as weights across the two latest surveys. “Asset-poor” households refer to those households whose wealth index score is in the bottom 40 percent of distribution for the given survey country/year.

Food insecurity is also an increasing concern in the region. Undernourishment tends to be driven by escalating conflict and competition over natural resources and by climate change and environmental degradation spurred by population growth. The Lake Chad Basin was recently characterized as one of three major food insecure hotspots in West Africa, where food insecurity is on the rise after having declined for several years, according to a World Bank and FAO report.³⁵ Between 2014 and 2019, the number of undernourished people in West Africa rose from 32 million to 56 million (that is, from 10 percent to 15.2 percent of the population). The highest numbers were found in northern Nigeria (5.0 million), Cameroon (1.4 million), and Niger (1.4 million). The United Nations Office for the Coordination of Human Affairs puts the number of people facing crisis and emergency levels of food insecurity in Nigeria's North East at 4.3 million, and 500,000 children are at risk of severe malnutrition.³⁶ Food insecurity is likely increasing because of COVID-related impacts. Five million more people were acutely food insecure in West Africa in 2020 during the lean season between June and August, compared with the five-year average, that is, 17 million versus 12 million people, respectively).³⁷ Between March and May 2021, 19.6 million people required immediate food assistance.

1.3.3 Local Economic Dynamics

In addition to lagging in terms of core poverty indicators, the Lake Chad region has experienced little economic progress over the past three decades. An analysis of local economic growth based on nighttime light intensity—which serves as a useful proxy for capturing both the size of local economic activities and the change in this activity over time—shows that the intensity of nighttime light is strongly correlated with the

distribution of people and economic activity (Map 1.6, panel a).³⁸ Overall, nighttime light grew more quickly in areas that appear to be more densely populated or characterized by higher levels of economic activity (as indicated by nighttime light), particularly in Nigeria's North Central and South West (Map 1.6, panel b).

Seen from space, the regions near Lake Chad in Cameroon and Nigeria exhibit a relatively low level of luminosity and lower rates of growth. The gaps in the intensity of nighttime light between the Lake Chad region and other parts of the countries are particularly stark in Cameroon and Nigeria, whereas, in Chad and Niger, the average intensity of nighttime light is slightly higher in the Lake Chad region (Map 1.6, panel c). The annual rate of growth in nighttime light is also slower in the Lake Chad region compared with other parts of Cameroon and Nigeria. This implies that there has been no substantial regional growth in the areas around the lake. In Nigeria, in particular, increases in the intensity of nighttime light between 1992 and 2013 were much slower in the Lake Chad region compared with the rest of the country (Map 1.6, panels c and d).

1.3.4 Human Capital Outcomes and Access to Basic Services

In addition to monetary poverty indicators and economic growth, the Lake Chad region lags in key human capital indicators.³⁹ The literacy rate (ages 15 or more) and the completion rate in primary education (ages 14–25) are significantly lower in the Lake Chad region compared with the national average (Figure 1.4). Child health conditions in the region are also grim. For instance, child stunting is roughly 10 percent–15 percent higher in the Lake Chad region compared with other

35 The other two areas are the Central Sahel and eastern Mauritania (World Bank and FAO 2021).

36 OCHA (2020).

37 World Bank and FAO (2021).

38 The analysis of nighttime light relies on Defense Meteorological Satellite Program–Operational Line-Scan System data that are intercalibrated by Li et al. (2020), allowing for a better comparison over time. The intensity of nighttime light is measured in a digital number ranging from 0 and 63 that represents an average of lights in all nights after sunlight, moonlight, aurorae, forest fires, and clouds have been removed algorithmically, leaving mostly human settlements.

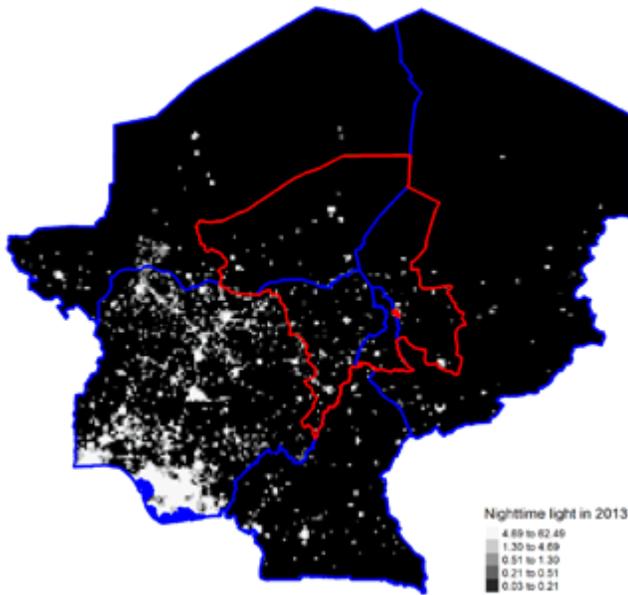
39 The results presented in this section are drawn from Masaki and Rodríguez-Castelán (2021), technical paper for this report.

parts of the countries (see Appendix 1.A, Table A1). Based on original analysis performed for this report, these results are in line with other studies. For example, according to the International Crisis Group, the gross school enrolment rate in the lake area of Chad is below

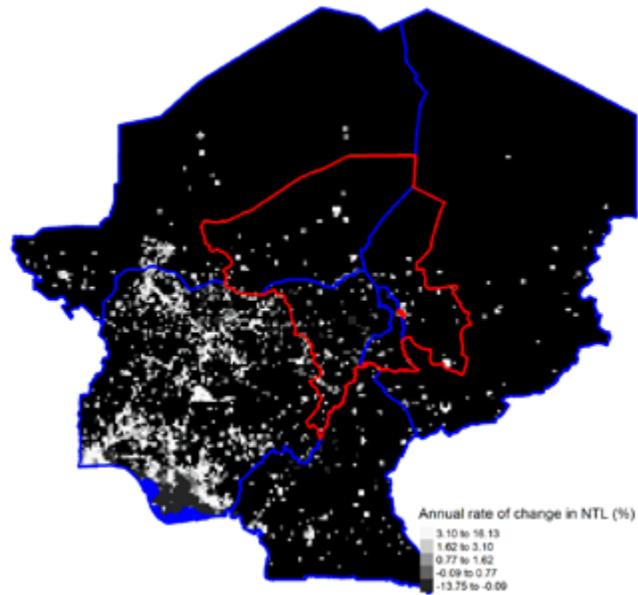
30 percent, and community teachers (largely the parents of pupils) generally stand in for trained teachers.⁴⁰ In the Chadian part of the lake, there is only one doctor for every 140,000 inhabitants, that is, a quarter of the national average.⁴¹ The low access and quality of education, health

Map 1.6: Growing economic gap, Lake Chad region and rest of the countries, 1992–2013

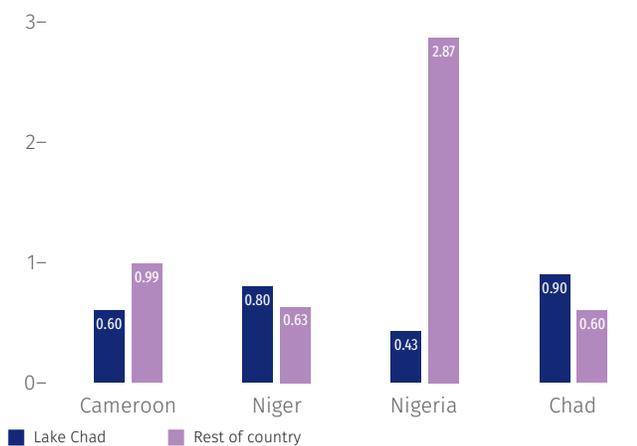
a. Nighttime light intensity, 2013



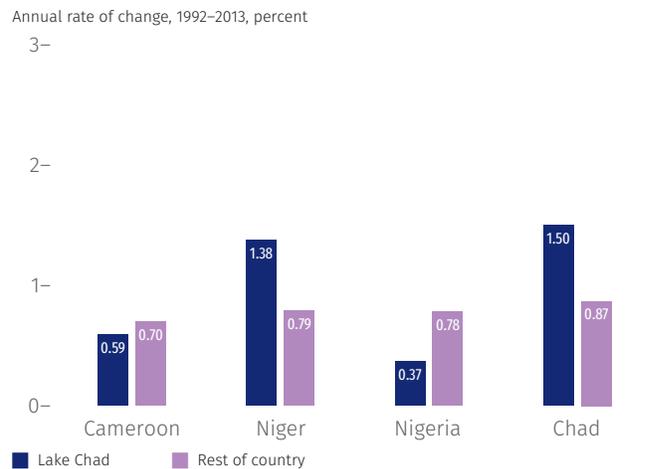
b. Annual change, nighttime lights, 1992–2013



c. Nighttime light intensity, 2013



d. Change in nighttime lights



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.

Note: Panel a shows the mean of nighttime luminosity in 2013 based on stable Defense Meteorological Satellite Program intercalibrated nighttime lights data (Li et al. 2020) at a spatial resolution of 10 kilometers. Panel b shows the annual rate of growth in the mean of nighttime luminosity between 1992 and 2013 in percent. Panels c and d show the mean of nighttime luminosity and the annual rate of change in nighttime luminosity in percent during the same time period. The calculations for panels c and d were performed only on a subset of grid cells that are lit (with a positive value in digital number at some point between 1992 and 2013) thus excluding areas that are largely rural and unpopulated.

40 ICG (2017).

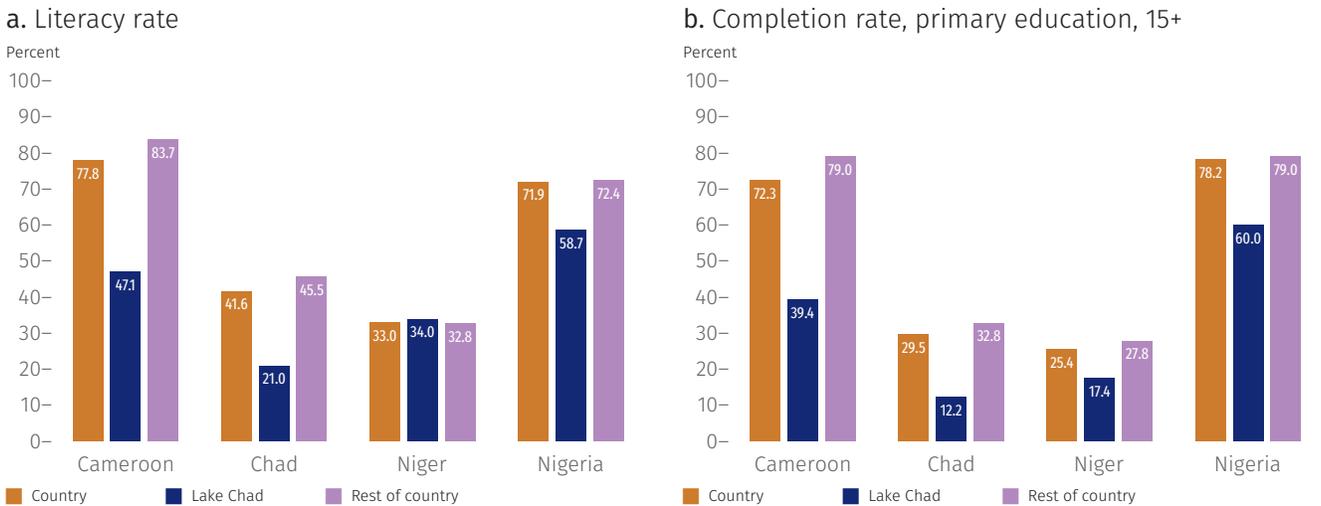
41 ICG (2017). The figure for Chad is much lower than in Cameroon’s Far North region (1/52,000) or Niger’s Diffa region (1/24,500), both close to the lake.

care, and other services in the region has been aggravated by the erosion of infrastructure, both public and private, resulting from the conflict.⁴²

Access to core public services in the Lake Chad Basin is also among the lowest in the area. The national

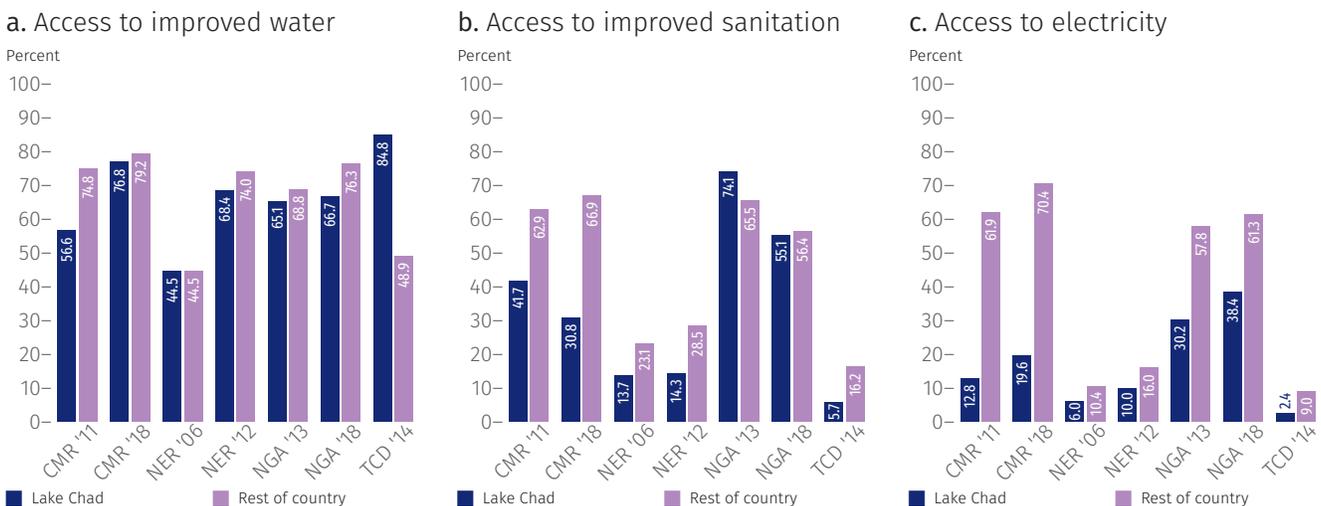
average rate of access to electricity in Cameroon, Chad, Niger, and Nigeria is 62 percent, 8 percent, 14 percent, and 59 percent, compared with an estimated 20 percent, 2 percent, 10 percent, and 38 percent in the Lake Chad region, respectively. The Lake Chad areas of Cameroon and Chad suffer from lower levels of access to improved

Figure 1.4: Literacy and primary school completion rates are lower in the Lake Chad region



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.
 Note: Data on poverty are based on the latest household surveys conducted in Cameroon (2014), Chad (2011), Niger (2014), and Nigeria (2018). Rest of country = outside the Lake Chad region.

Figure 1.5: Access to core public services in the Lake Chad region



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.
 Note: The figure shows the percentage of households with access to improved water and sanitation and electricity. Data on access to these core public services are taken from the two latest Demographic and Health Surveys in each country. CMR = Cameroon. TCD = Chad. NER = Niger. NGA = Nigeria. The year is the year in which the survey was conducted.

42 It is reported that, during the armed group's eight-year rebellion, almost 1,400 schools have been destroyed in Borno and more than 57 percent of schools are unable to open because of damage or being in areas that remain unsafe (Al Jazeera 2017). Regarding health facilities: "Insurgents have destroyed about 788 health facilities in the region. In Borno 48 health workers have been killed and over 250 injured. The state has lost up to 40 percent of its facilities and only a third of those left in Borno state remain functional," (Obi and Eboime 2017).

water and sanitation facilities compared with other parts of the countries (Figure 1.5). This gap is particularly pronounced in Cameroon, where the rate of access to improved water and sanitation is, on average, about 36 percent lower in the Far North Region than in the rest of the country.

There are also signs of a widening gap between the Lake Chad region and the rest of the surrounding countries in access to improved sanitation and electricity. In Cameroon, the share of households with access to improved sanitation in the Lake Chad region declined from 42 percent to 31 percent between 2011 and 2018, whereas the rest of the country experienced a modest improvement (from 62 percent to 67 percent) over the same period. A similar divergence pattern emerges in Nigeria, where access to improved sanitation in the Lake Chad area decreased from 74 percent to 55 percent between 2013 and 2018, a more rapid rate of decline than in the rest of the country (where access fell from 66 percent to 56 percent). Progress in expanding access to electricity in the Lake Chad region has also stagnated. In Niger, the regions of Diffa and Zinder saw access to electricity improve by 4 percentage points (from 6 percent to 10 percent) between 2006 and 2012, a slightly lower increase than in the rest of the country (where access improved by nearly 6 percentage points, from 10.4 percent to 16.0 percent) (Figure 1.5).

1.3.5 Trends in Agriculture

Agriculture constitutes the main sector of economic activity in the Lake Chad region. According to the latest household expenditure survey available in each country, the primary sector (agriculture, cattle herding, and fishing) accounts for about three-fourths of employment in areas near Lake Chad (Figure 1.9). Agriculture also

generates significant indirect employment in related activities such as trade, transport, and manufacturing (for example, food processing, leather industry, brewing).⁴³ The main crops produced in the Lake Chad area include subsistence crops (cassava, millet, rice, sorghum, and onions) and cash crops (cotton, groundnuts). Red peppers are also an important cash crop along the Yobe River in Niger. Most of the farming in the Lake Chad Basin is rainfed, harvested by hand, and cultivated without the use of fertilizers and other agrochemicals. Millions of people—particularly in Cameroon, Chad, and Niger—depend on the lake for most of their economic activities and livelihoods. The resulting pressure on the soil and the depleting water resources pose serious sustainability problems for these activities.⁴⁴ At the same time, rather than a homogeneous market, agriculture in the region is a complex sector, encompassing both farming and herding. The two modes of production sometimes compete over resources and land. The competition over land between farmers and herders is often cited as a source of conflict, which is exacerbated by climate change and the lack of land rights. Tenure insecurity can limit access to land, investment in agriculture, and productivity. The limited capacity of local customary and informal mechanisms of enforcement of land rights across the region do not appear to be sufficient to cope with competition among farmers and herders.⁴⁵ It is estimated that, in 2018, there were more than 1,800 deaths across Africa from transhumance-related conflict associated with the added pressures on access to land.⁴⁶

The Lake Chad region has seen an increase in arable or cropland areas over the past two decades, although recent years have seen a slight decline. According to an analysis of geospatial data from the European Space Agency,⁴⁷ the annual growth rate of cropland area inside the study area near Lake Chad in the four countries started at 0.31 percent during 1992–2000, fell to 0.24 percent

43 UNEP (2004).

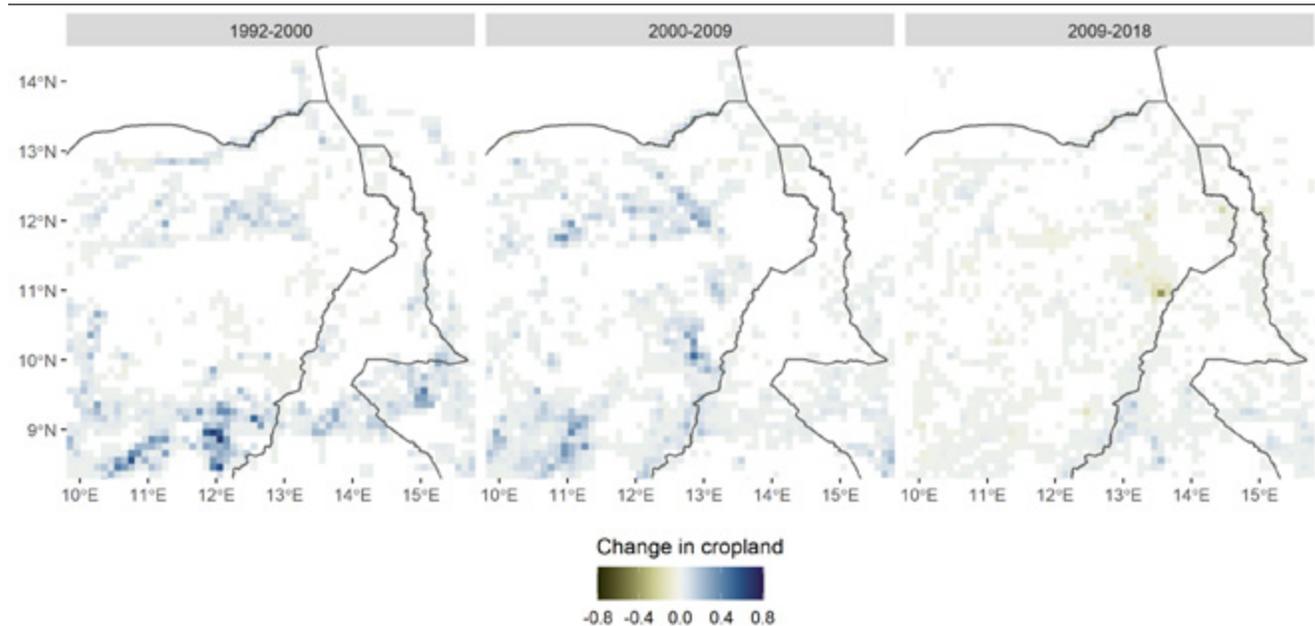
44 Odada et al. (2005).

45 World Bank and FAO (2021).

46 Skah and Lyammouri (2020).

47 The results presented in this section draw on Blankespoor (2021), technical paper for this report.

Map 1.7: Trends in cropland area: 1992–2000, 2000–09, and 2009–18



Sources: Blankespoor 2021, technical paper for this report; data of ESA 2017.

during 2000–10, and was slightly negative during 2010–19. The annual growth rate of cropland area outside the study area in the four countries started at 0.48 percent during 1992–2000, fell to 0.33 percent during 2000–10, and was slightly positive during 2010–19 (Map 1.7). Irrigated areas represented only about 5 percent of the cropland area inside the study area and about 3 percent of the cropland area outside the study area between 1992 and 2019. The poor quality of irrigation—exacerbated by the variability in the level of the lake and the associated water resources as well as by the intensification of conflict leading to the destruction of irrigation systems—has made agricultural productivity in the region particularly vulnerable to erratic rainfall patterns and climate change.⁴⁸

Most of the agricultural production within the Lake Chad region is spatially concentrated in the three states of Adamawa, Borno, and Yobe in Nigeria’s North East. Map 1.8, panel a, illustrates the distribution of subnational agricultural gross domestic product (GDP) circa 2010, which is derived using a data fusion

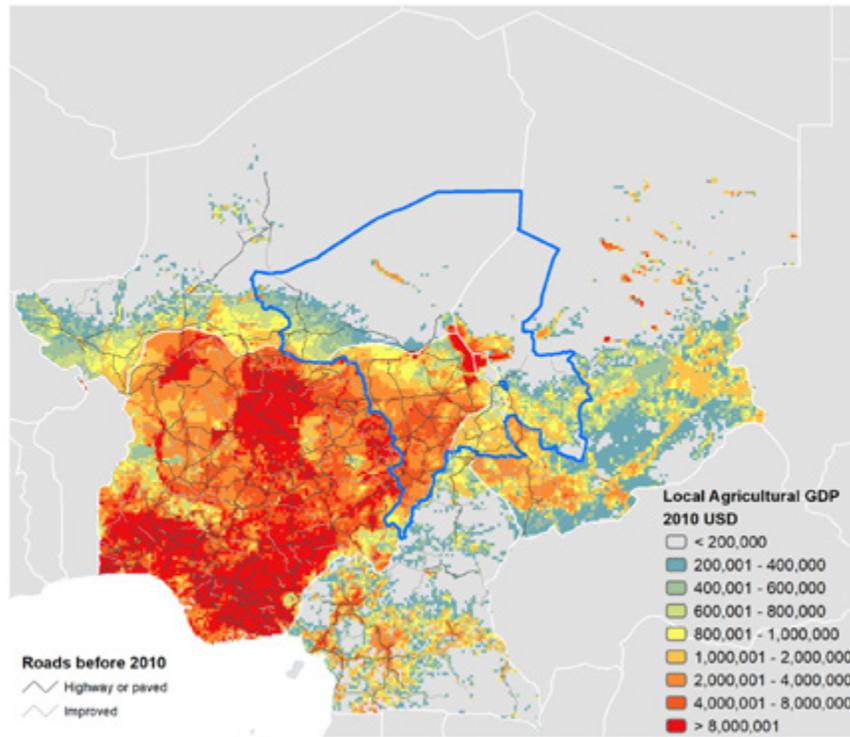
method based on cross-entropy optimization that disaggregates administrative level agricultural GDP into grids depending on satellite-derived indicators of the components that make up agricultural GDP, namely, crop, livestock, fishery, hunting, and timber production.⁴⁹ The level of agricultural GDP in Nigeria is considerably higher compared with the other three Lake Chad Basin countries. Patterns of agricultural production also differ significantly within the Lake Chad region by crop. For instance, cotton production is spatially concentrated in Adamawa in Nigeria and the Far North Region in Cameroon (panel b), whereas millet and sorghum production is more common in southern Niger and northern Nigeria (panel c) and in northern Nigeria and Cameroon’s Far North (panel d), respectively. For the four countries, panel e illustrates dominant livelihoods with similar patterns considering how people gain access to food and income as well as markets. The northern areas of Chad and Niger are sparsely populated, with activities including salt, dates, and trading activities in oases along with nomad pastoralism and transhumance.

48 FAO (2016).

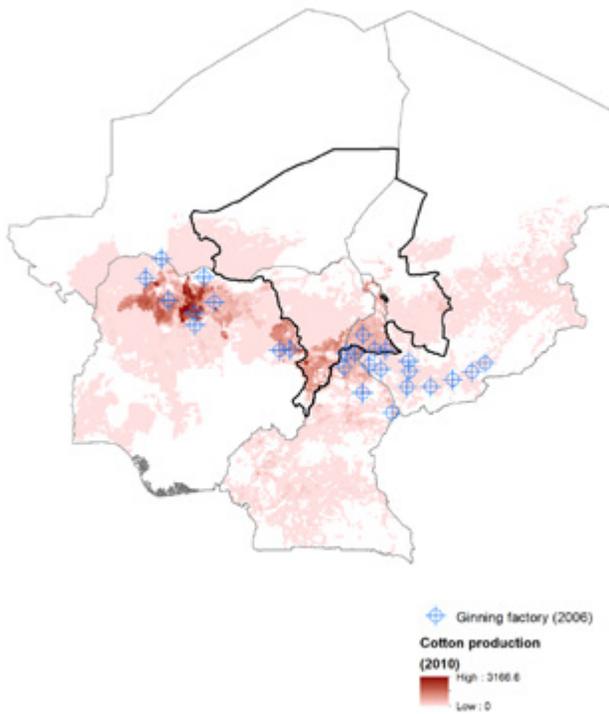
49 For more details on the methodology, see Blankespoor et al. (2021).

Map 1.8: Agricultural activities in the countries of the Lake Chad Basin

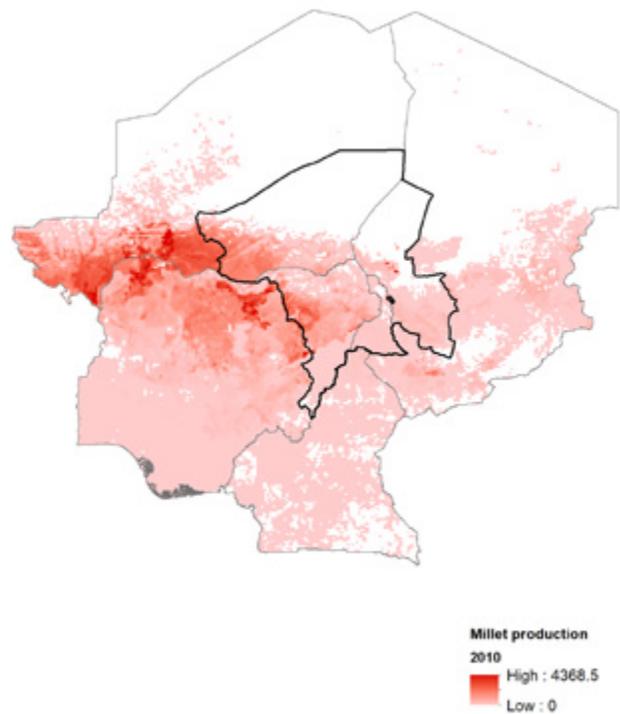
a. Agricultural GDP estimates



b. Cotton production

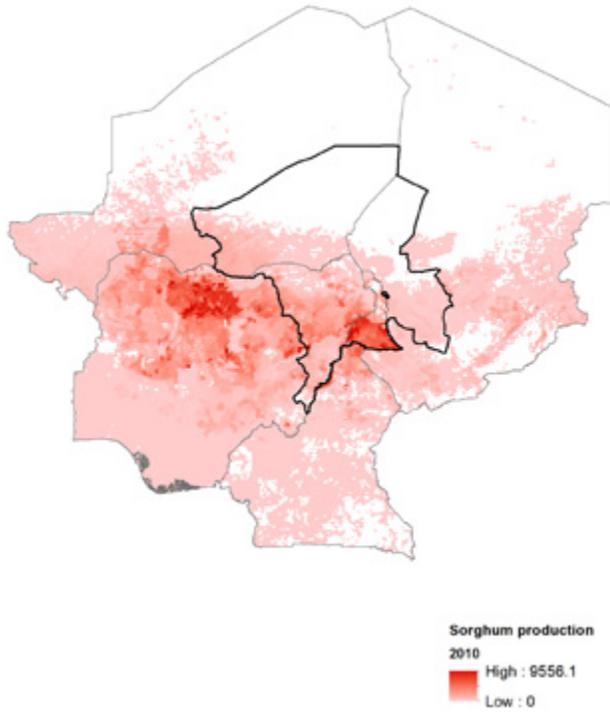


c. Millet production

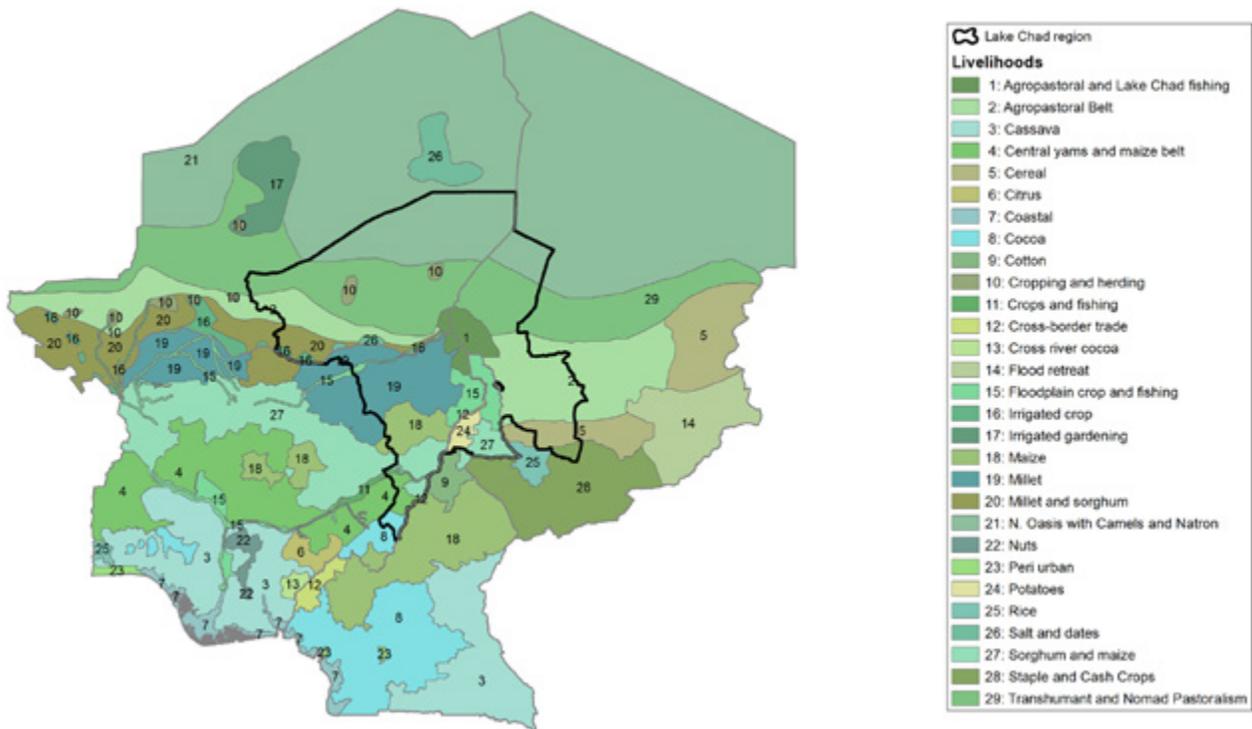


Map 1.8: Agricultural activities in the countries of the Lake Chad Basin (continued)

d. Sorghum production



e. Livelihoods



Sources: Blankespoor 2021, technical paper for this report. Data of Blankespoor et al. 2021; FEWS NET (Famine Early Warning Systems Network) (dashboard), Washington, DC, <https://fews.net/>; Yu et al. 2020.

An agropastoral belt with millet and sorghum is located in southern Niger, where most of the population lives. Northern Nigeria has cultivated areas with diverse crops, including millet and sorghum as well as livestock. The area nearby Lake Chad includes flood retreat cultivation and fishing activities. This belt has relatively higher local crop production value and contributes over US\$1 million in local agricultural GDP (2010 US dollars).

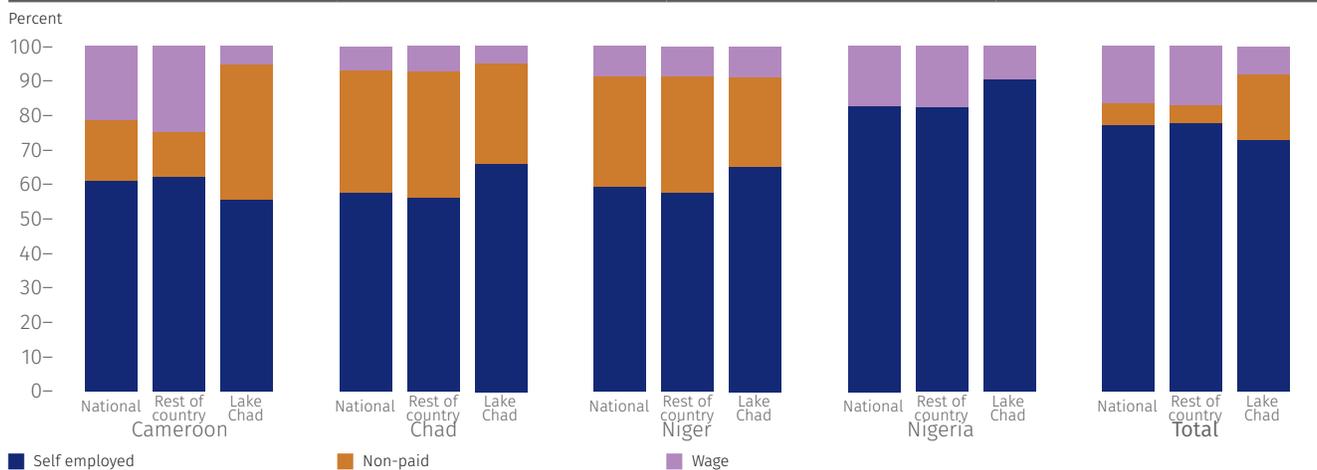
1.3.6 Jobs and Labor Market Composition

The labor market in areas near Lake Chad is predominantly characterized by poor jobs—that is, self-employment and informal work. The overall employment rate among working-age individuals is high in the Lake Chad region, averaging 71 percent, compared with 72 percent in areas outside the lake basin. Men are more likely to be employed (82 percent) than women (60 percent). However, most working-age individuals hold relatively lower-quality jobs that are largely characterized by self-employment (particularly farm self-employment) and unpaid employment. Wage employment is particularly limited across the Lake Chad

region, only accounting for 8 percent of jobs, versus twice that rate (17 percent) in areas outside the lake basin. In the Lake Chad area in each country, wage jobs make up 5–10 percent of workers, from the lowest share in Chad (5 percent) to the relatively larger rate in Nigeria (10 percent) (Figure 1.6). Nonremunerated employment is also prominent in the region, representing 19 percent of jobs in the Lake Chad area of the four countries.⁵⁰

Wage employment among women is particularly limited in the Lake Chad region. The gap in the quality of jobs is exacerbated by sex. At the national level, 11 percent of women have wage employment compared with 22 percent of men in the four basin countries (Figure 1.7). In the Lake Chad region, the share of women who have wage employment is one-fourth that of men (3 percent versus 12 percent, respectively). At the country level, the largest gap in wage employment is in Cameroon, where 2 percent of women have wage employment in the areas near Lake Chad, compared with 15 percent of women in the rest of the country (Figure 1.7). The share of wage employment among men is also lower in the Cameroonian Lake Chad region (9 percent) compared with other parts of the country (34 percent). Overall, wage employment is skewed toward men.

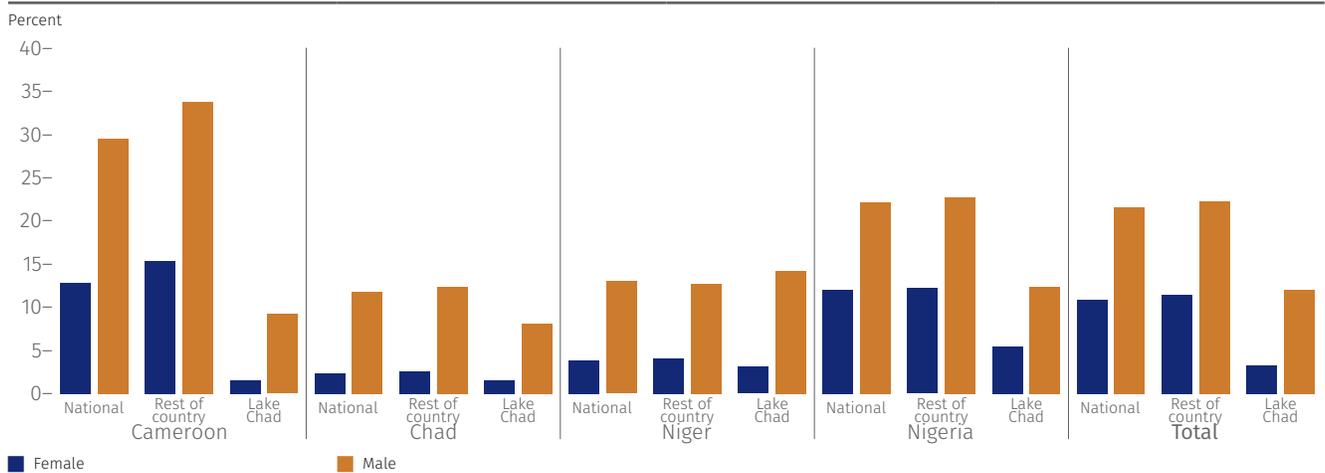
Figure 1.6: Employment type across the Lake Chad region



Source: World Bank calculations based on the latest household surveys available in Cameroon (2014), Chad (2018), Niger (2018), and Nigeria (2018). Note: Nigeria's latest household survey does not differentiate between paid and unpaid employment. Thus, only for Nigeria unpaid employment is subsumed in self-employment. Includes only working-age individuals (ages 15–65). Rest of country = outside the Lake Chad region; Lake Chad = within the Lake Chad Basin region.

50 Nonremunerated employment includes apprenticeships and family workers. Nigeria's latest household survey does not differentiate between paid and unpaid employment and the latter is subsumed in self-employment. Because of the sampling design of the Nigeria 2018 survey, distinguishing between unpaid and wage employment is not possible for this country.

Figure 1.7: Wage employment by gender across the Lake Chad region



Source: World Bank calculations based on the latest household surveys available in Cameroon (2014), Chad (2018), Niger (2018), and Nigeria (2018). Note: Data include only working-age individuals (ages 15–65). Rest of country = outside the Lake Chad region; Lake Chad = within the Lake Chad Basin region. Nigeria's latest household survey does not differentiate between paid and unpaid employment. Thus, only for Nigeria, unpaid employment is subsumed in self-employment.

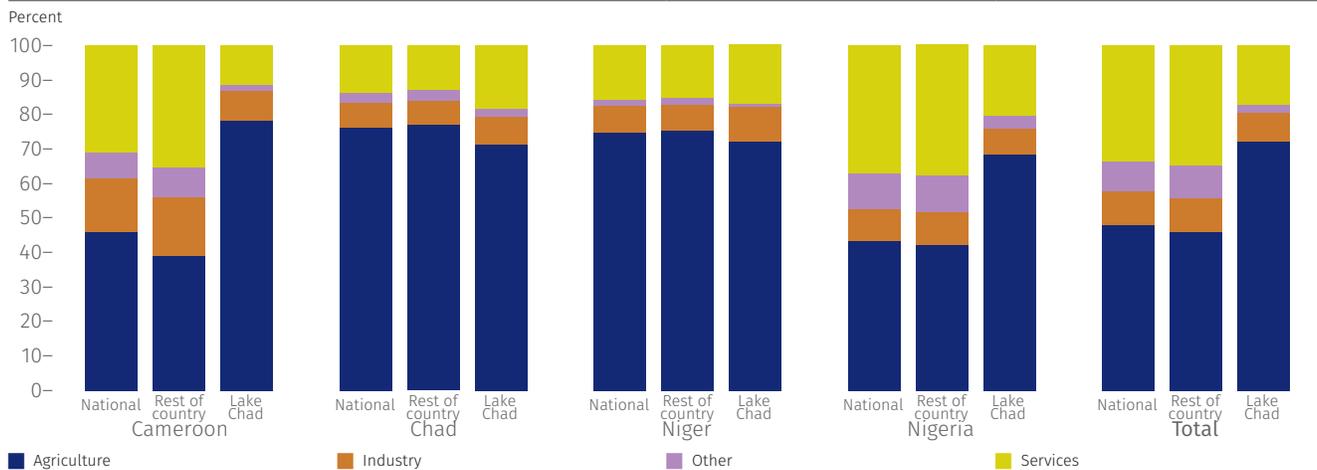
The gender gap in access to wage employment is more pronounced across young individuals ages 15–24. At the national level, 8 percent of young women engage in wage employment (4 percentage points lower than adult women) compared with 13 percent of young men (11 percentage points lower than adult men) in the four basin countries. In the Lake Chad region proper, the share of young women who have wage employment is roughly one-third that of men (3 percent versus 8 percent, respectively). This gap more than doubles among adult individuals, where 13 percent of men have wage employment, compared with 4 percent of adult women. These figures attest to low access to quality jobs across the Lake Chad region among young individuals, particularly among young women.

Agriculture—including farming, fishing, and hunting—is the predominant sector of employment in the Lake Chad region. Around 72 percent of workers are employed in agriculture across the four countries in the Lake Chad region, employing 70 percent of men and 73 percent of women.⁵¹ In Cameroon and Nigeria, the share of people in agriculture in the lake basin is much higher compared with the rest of the respective countries (Figure 1.8). In the Cameroonian area of Lake Chad,

79 percent of workers are employed in the agricultural sector compared with half that rate (39 percent) in the rest of the country. The proportions are slightly less extreme in Nigeria, but still large, with 72 percent of workers in agriculture in the Nigerian section of the lake compared with 42 percent in the rest of the country (Figure 1.8). Chad and Niger do not exhibit major differences in subnational areas given that most of the national economy is already heavily dependent on agriculture in the two countries. The role that agriculture plays in employment and the labor market highlights the importance of opening (and keeping open) agricultural trade and agricultural markets, which closed down as a result of the crisis.

The service sector is the second largest source of employment across the Lake Chad region, but the sector's share is significantly higher in other parts of the countries. On average, 17 percent of workers are employed in the service sector in the Lake Chad region (Figure 1.8). In Cameroon and Nigeria, the employment share in the service sector in the lake region stood at 11 percent and 20 percent, respectively, compared with 35 percent and 38 percent in other parts of the two countries.

51 Cameroon has the highest labor share of agriculture, at 78 percent of workers and Nigeria the less high, at 69 percent.

Figure 1.8: Distribution of employment by sector across the Lake Chad region (4-digit)

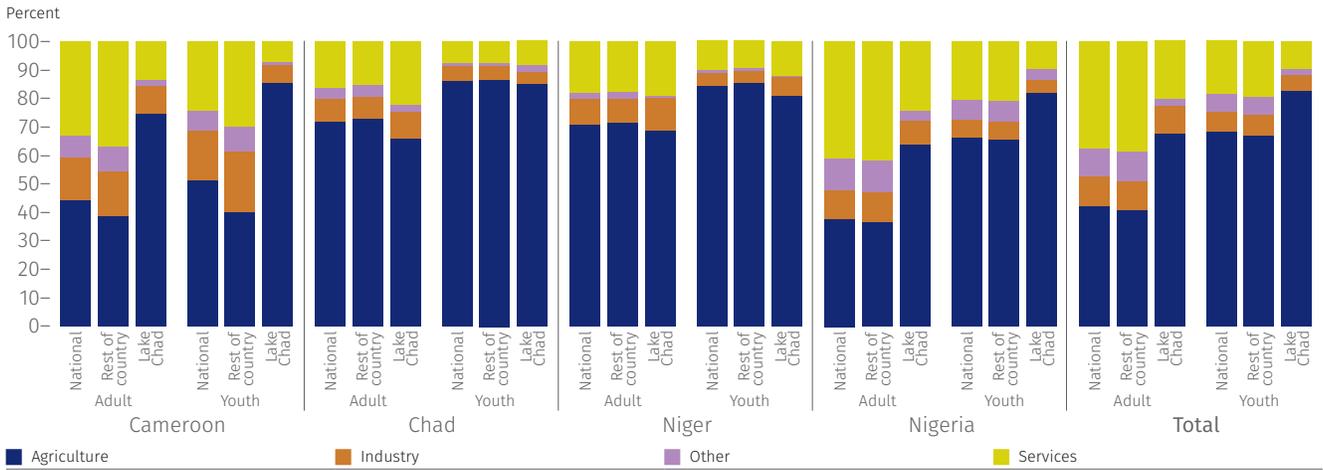
Source: World Bank calculations based on the latest household surveys available in Cameroon (2014), Chad (2018), Niger (2018), and Nigeria (2018). Note: Data include only working-age individuals (ages 15–65). Rest of country = outside the Lake Chad region; Lake Chad = within the Lake Chad Basin region.

Gender gaps within the service sector are also significant. In the service sector in the Lake Chad region, men are employed at a higher rate than women (20 percent and 14 percent, respectively). This pattern does not hold, however, in areas far from the lake, where a larger share of women are employed in the service sector (40 percent), compared with men (30 percent). Youth employment in the service sector in the Lake Chad region is roughly the same for men and women (10 and 9 percent, respectively). But differences exist between the region and elsewhere: youth employment in the service sector among women in the areas surrounding the lake is less than half compared with the areas outside the Lake Chad region, where it stands at 25 percent. A similar pattern is observed in adult employment among women, for whom the share of employment in services in areas far from the lake is 44 percent, compared with only 16 percent in areas near the lake. This gap is much narrower among adult men, among whom there is only a 10 percentage point difference in employment in services between the lake and non-lake areas. Commerce accounts for the largest share of service sector employment in the Lake Chad region. The share of employment in commerce is 10 percent among both men and women in the Lake Chad region. This is one-third the employment share in commerce in areas outside the region among women (nearly 31 percent), and lower than the share among men (at 15 percent). A similar pattern can be seen in youth

employment among women in commerce, which is less than half compared with areas outside the Lake Chad region.

A larger proportion of young workers engage in agriculture compared with adults. Agricultural jobs are concentrated among young workers (ages 14–25), with 83 percent employed in the agricultural sector in the Lake Chad region, compared with 68 percent among adults (Figure 1.9). The share of employment in agriculture among youth is much lower outside the Lake Chad region. Among young individuals, the share of agricultural employment decreases to 67 percent in the rest of the country. A similar pattern is observed among adults (down to 41 percent). The country with the highest differential is Cameroon, where the share of youth employment in agriculture in areas near Lake Chad is 86 percent, compared with 40 percent in the rest of the country. A similar pattern is also observed among older workers. In contrast, in Niger, there is little difference in the share of agricultural employment between areas near Lake Chad and the rest of the country (Figure 1.9). Considering the distribution of gender as well as age in areas near the lake, it emerges that 84 percent of young men are employed in agriculture, compared with 66 percent of adult men. The gap between young people and adults is more acute among women, where 82 percent of young women are employed in agriculture, compared

Figure 1.9: Distribution of employment by sector and age (youth versus adults) (4-digit)



Source: World Bank calculations based on the latest household surveys available in Cameroon (2014), Chad (2018), Niger (2018), and Nigeria (2018).
 Note: Data include only working-age individuals (ages 15–65). Youth includes individuals ages 15–24. Adult includes individuals ages 15–65. Rest of country = outside the Lake Chad region; Lake Chad = within the Lake Chad Basin region.

with 70 percent of adult women in the lake areas. In areas away from the lake, the gap widens; employment in agriculture among young women stands at 61 percent, compared with 38 percent among adult women.

1.4 Territorial Development within the Lake Chad Region

1.4.1 Density

Economic stagnation in the region is linked to low levels of density and urbanization: urban agglomerations in the region have grown more quickly, widening spatial gaps, while the shrinking of the lake between the 1960s and mid-1990s pushed people to migrate from rural to urban areas.

Enduring poverty and slow economic growth in the Lake Chad region have been linked to economic geography. A combination of *low* economic density and great distance and wide division appear to be derailing the region from a sustainable growth track. Density refers to the economic mass or output per unit of land area. It can be measured as the value added or GDP generated per square kilometer of land.⁵² The concentration of economic activity rises with development. Density tends to characterize urban settlements, though it can be low even if population density is high, such as in low-income urban enclaves.

1.4.1.1 Economic Density

The Lake Chad region is characterized by low economic density and lack of agglomeration economies. While the Lake Chad region accounts for 17 percent of the area of the four neighboring countries, its economy makes up only 5 percent of the relevant GDP (Map 1.9).⁵³ Most

economic activities in the region are spatially concentrated among a few large cities. Two metropolitan cities have a population of over one million—N'Djamena and Maiduguri. A few other secondary cities contribute to the economy of the region, including Damaturu (Nigeria), Jimeta (Nigeria), Maroua (Cameroon), Mubi (Nigeria), and Zinder (Niger). In Cameroon, most economic activities in the Lake Chad region are concentrated in the southern part of the Far North Region, particularly around the city of Maroua.⁵⁴ In Niger and Chad, the volume of economic activity in the regions around Lake Chad is small and tends to cluster around areas near the borders with Cameroon and Nigeria.

1.4.1.2 Urbanization⁵⁵

The long-term shrinking of the lake observed until the mid-1990s had a negative impact on local population growth. The analysis presented here takes advantage of a novel dataset based on digitalized population censuses.⁵⁶ The dataset tracks population patterns at a granular level between the 1950s and the 2010s, facilitating an assessment of local population growth. The findings of the analysis show that areas close to the lake experienced relatively slower total population growth after the lake began to shrink around the early 1960s up to the mid-1990s.⁵⁷ In Niger, for instance, a one standard deviation in proximity to the lake is associated with a 0.3 and 0.5 standard deviation decrease in log population by 1969 and 1988, respectively, relative to the population level as first recorded in 1962—a few years before the lake began

52 World Bank (2009).

53 Calculated based on Ghosh et al. (2010).

54 See UNHCR and World Bank (2016).

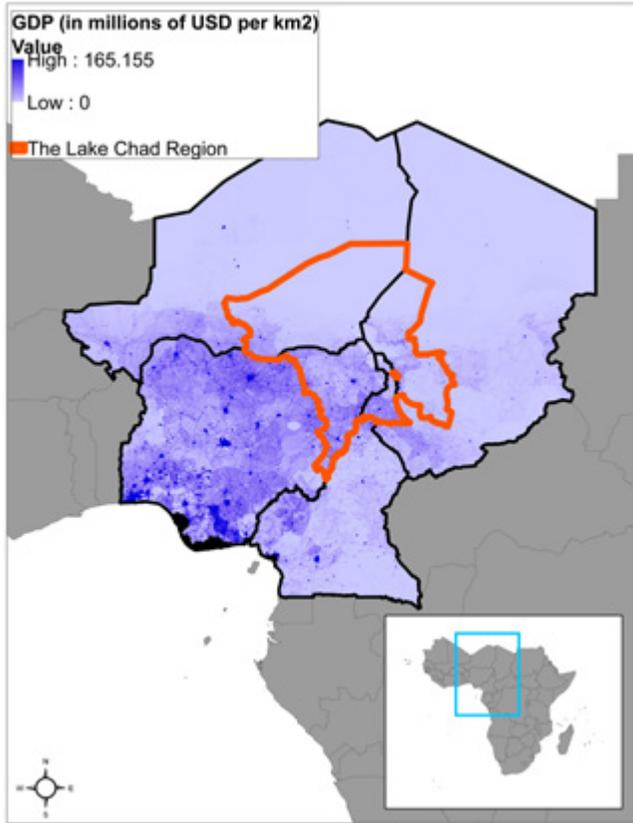
55 Due to data limitations, this report does not assess forced displacement in the Lake Chad region, which is certainly an important topic.

56 The results presented in this section are taken from Jedwab, Haslop, et al. 2021, technical paper for this report.

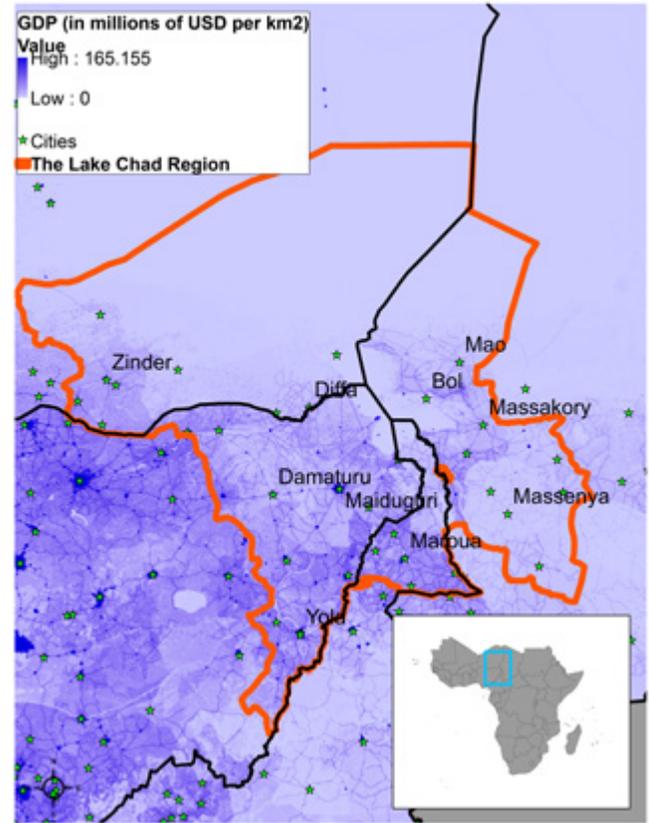
57 The observed shrinkage of the lake between 1960s and mid 1990s had to do with reduced rainfall in the Central African Republic, not local economic conditions, thus assuaging reverse causality concerns. The shrinkage of Lake Chad during those years thus offers a natural experiment to examine how long-term lake drying can affect both rural and urban communities.

Map 1.9: Economic activity in the Lake Chad region, 2010

a. Estimated subnational real GDP (2006) in Cameroon, Chad, Niger, and Nigeria

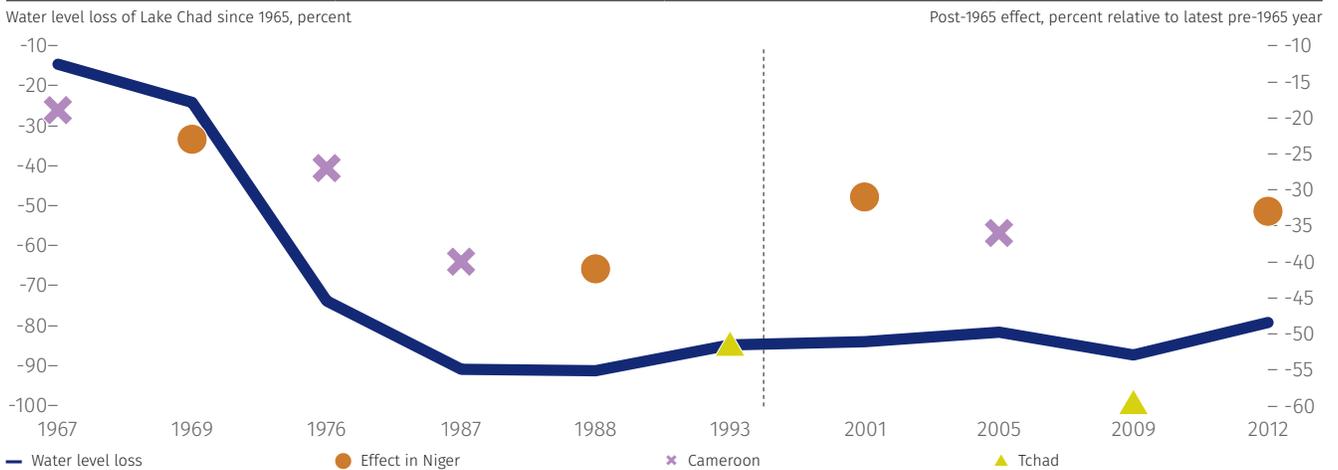


b. Estimated subnational real GDP (2006) in the Lake Chad region



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report. Calculations are based on data of Ghosh et al. 2010. GDP estimates are based on nighttime lights satellite imagery and LandScan population grids.

Figure 1.10: Total population effect of proximity to Lake Chad, 1940s–2010s



Source: Jedwab, Haslop, et al. 2021, technical paper for this report.

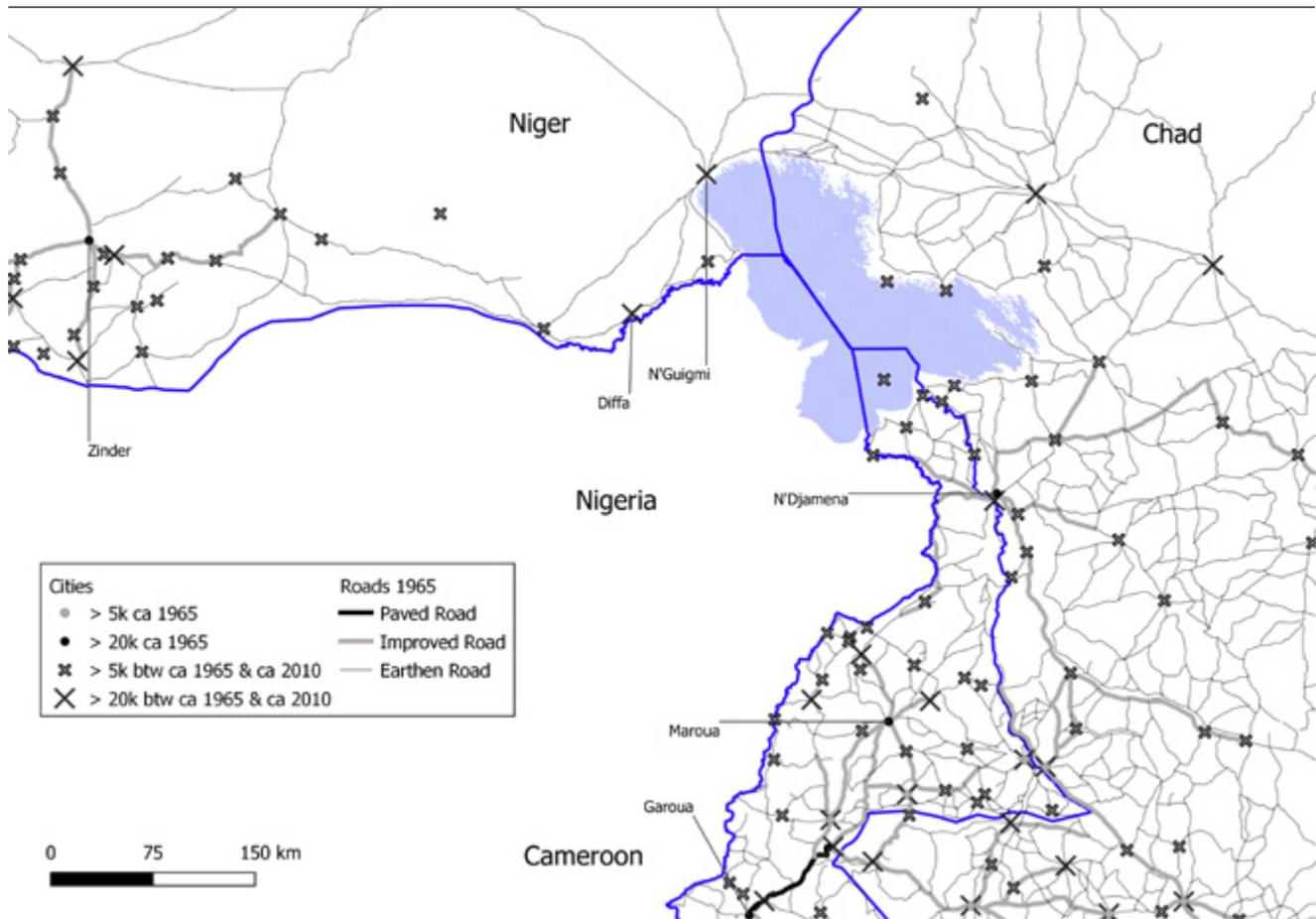
to shrink (Figure 1.10). Negative population effects are even larger in Cameroon, where a one standard deviation in proximity to the lake is associated with a 0.7 and 1.0 standard deviation decrease in log population in 1976 and 1987, respectively, relative to the population level in 1963. In Chad, a one standard deviation in proximity to the lake is associated with a 0.9 standard deviation in log population in 1993. Since the mid-1990s, the water level in Lake Chad has been recovering.

There are few secondary towns or cities with more than 20,000 inhabitants in the region, which could otherwise serve as a catalyst for generating agglomeration economies to foster economic growth.

In Niger, between 1965 and 2012, the number of small towns (at least 5,000 inhabitants) increased from 14 to 161, while the number of (relatively) larger towns (at least 20,000 inhabitants) rose from 4 to 26. In Cameroon, the number of small and large towns increased from 51 to 173 and from 10 to 54 between 1965 and 2005, while, in Chad, the corresponding numbers rose from 11 to 94 and from 4 to 23 between 1964 and 2009 (Map 1.10).

The shrinking of the lake observed between the 1960s and the mid-1990s led to migration from rural areas to cities near the lake. The analysis finds signs of refugee urbanization in areas near the lake because of the lake's shrinkage during these years.⁵⁸ As access to the rich water

Map 1.10: Trends in city population around Lake Chad, circa 1965–2010



Source: Jedwab, Haslop, et al. 2021, technical paper for this report.

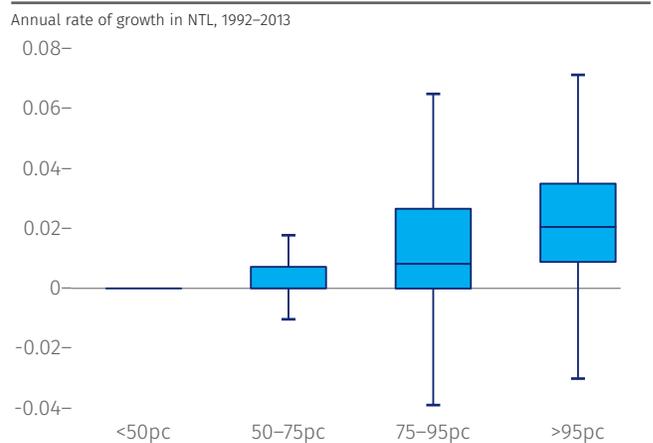
Note: The map shows the location of 5,000+ and 20,000+ urban settlements circa 1965, when the lake started shrinking, and circa 2010, at the end of the period of study. It also indicates regionally important (20,000+) cities in the 1960s, such as Diffa, N'Guigmi and Zinder in Niger, N'Djamena in Chad, and Maroua and Garoua in Cameroon. It also shows paved roads, improved roads, and earthen roads, all circa 1965.

58 See Jedwab, Haslop, et al. 2021, technical paper for this report.

resources and economic opportunities provided by Lake Chad became increasingly limited, people in the region may have migrated to cities in search of better economic opportunities. This phenomenon was particularly visible in Niger, where the shrinkage of Lake Chad between the 1960s and mid-1990s had a clear positive impact on the expansion of larger cities around the lake. Despite the existence of many rural settlements and small towns close to the lake, there were no small cities in eastern Niger and no large cities close to the lake in 1962. But two large cities—Diffa and N’Guigmi—rose quickly in the area. Diffa had fewer than 1,000 inhabitants in 1962; yet, by 2012, it had become Niger’s 11th largest city. N’Guigmi was historically located on the shore of the lake, a center for fishing communities. Its dramatic growth from 3,000 people in 1962 to more than 25,000 today must have been driven by the locality functioning as a refugee settlement for individuals who had lost their rural livelihoods. As these two larger cities emerged, the need for smaller cities might have been reduced; hence, the negative effect observed among these smaller locations. A similar pattern of refugee urbanization was also observed in Cameroon during the years of the shrinkage of the lake, although the positive effects on city populations were much weaker in Cameroon compared with Niger. In Chad, no such effect was observed.

More densely populated urban agglomerations continue to grow faster than less densely populated areas, thereby widening spatial gaps in density. Controlling for the level of economic activity (as proxied by nighttime lights in 1992), the initial level of population density is positively correlated with the annual rate of economic growth measured by the intensity of nighttime lights (Figure 1.11). More substantively, a 1 percentage point increase in the initial level of population density is associated with a 0.2 percent increase in the annual rate of growth in nighttime lights.⁵⁹ The findings are consistent with other studies showing that the locations of urban agglomerations remain persistent over time,

Figure 1.11: Population density is positively correlated with regional growth, 1990



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.
 Note: Excludes outside values. The bottom of the rectangular box represents the lower quartile (25th percentile), and the top is the upper quartile (75th percentile). The horizontal line indicates the 50th percentile, which is provided for different initial levels of population density in 1990, ranging from the bottom 50 percentile (< 50 pc) to above the top 95 percentile (> 95 pc). The analysis is performed based on the sample of 5,212 grid cells (at a spatial resolution of 0.1 degrees) defined over the Lake Chad Basin countries that were lit (with a positive digital number in nighttime light luminosity) at some point between 1992 and 2013.

even after controlling for other factors that led to their establishment in the first place.⁶⁰ Urban agglomerations continue to grow more quickly than more sparsely populated areas, and this has important implications for widening spatial gaps between core cities and the rest of the countries.

1.4.1.3 Regional Convergence (Conditional Convergence)

The Lake Chad region as a whole does not show a clear sign of convergence with the rest of the countries in terms of local economic growth, thereby implying the perpetual nature of laggardness in the region. According to a multivariate regression analysis exploring the main drivers of local growth as measured by the annual rate of change in nighttime lights, the pace of local economic growth in the Lake Chad region is not statistically different from that of the other parts of the countries after one controls for other potential confounders

⁵⁹ This relationship holds whether the analysis is performed for all the Lake Chad Basin countries or restricted to the Lake Chad region only.

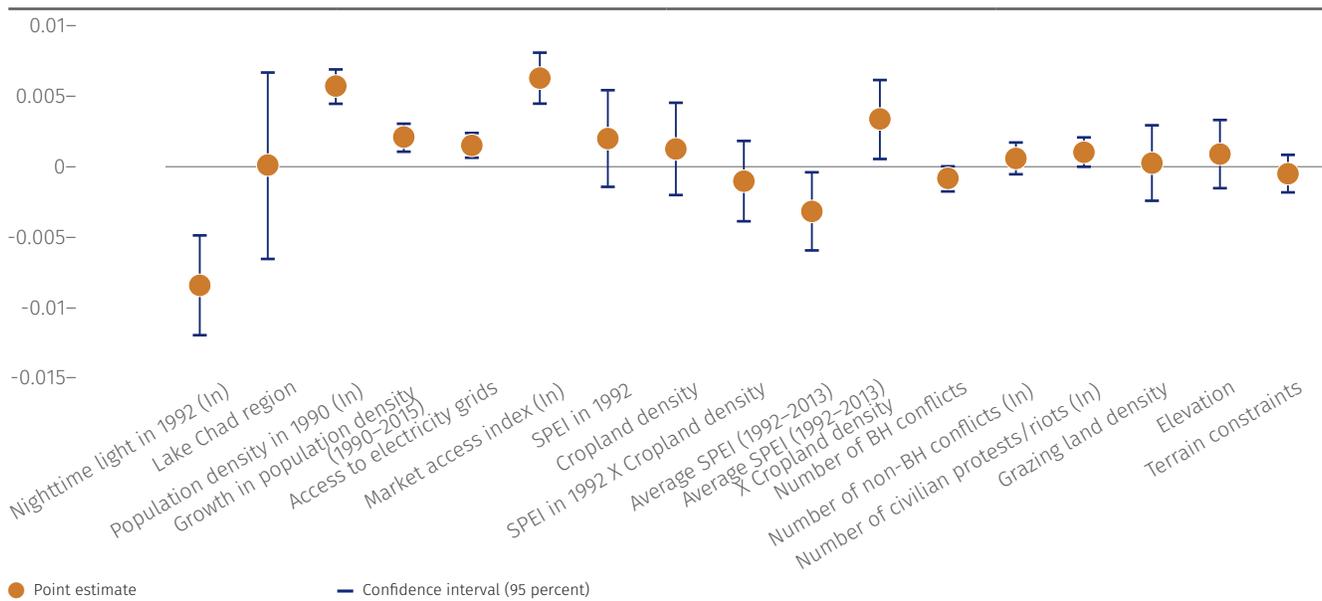
⁶⁰ Henderson et al.(2018); Jedwab et al.(2017).

(Figure 1.12).⁶¹ This implies that, conditional on various socioeconomic and geographic factors, the Lake Chad region is no different from the rest of the countries in the pace of growth. However, what this analysis also shows is that the laggardness of the region is persistent over time, with little economic dynamism in the region that might allow it to catch up with the rest of the countries. There are also some important differences across the Lake Chad Basin countries. In particular, as seen in Map 1.6, panel d, the spatial gap between areas near Lake Chad and the rest of the country is clearly deepening in Nigeria, with areas near Lake Chad experiencing a slower rate of growth in nighttime lights.

Two factors stand out as the key determinants of the trajectory of local economic growth: the initial level of nighttime light luminosity and population. These two variables explain roughly 20 percent of the variation in the

annual rate of growth in nighttime lights. This is perhaps not surprising given that nighttime lights are a function of both population density and economic activity.⁶² One way to interpret these results is that urban areas that initially had low levels of development (or luminosity) grew more quickly than other areas that exhibited high levels of development, thus narrowing the gaps between lagging and more advanced cities if one controls for population density and other socioeconomic factors.⁶³ This finding echoes a well-established body of literature on regional convergence whereby poor economies grow more quickly than rich economies.⁶⁴ Another important factor that drives regional growth is access to markets (see the following section). Meanwhile, exogenous geographical factors, such as land use (cropland or grazing land), elevation, and terrain constraints have no significant impact on regional economic growth.

Figure 1.12: Main correlates with local economic growth: Regression analysis



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.
 Note: The results are based on the beta-convergence regression wherein the dependent variable is the annual rate of growth in nighttime light luminosity between 1992 and 2013 and regressed on a number of socioeconomic, demographic, and geographical variables. The analysis is restricted to areas that are lit at some point between 1992 and 2013 and thus exclude largely rural or unpopulated areas. For ease of comparison, all the variables are standardized so that the result shows the effects of a standard deviation in each variable on the annual rate of growth in nighttime lights.

61 Note that this analysis is restricted to areas that are lit at some point between 1992 and 2013 (indicated by a positive value in digital number of luminosity).
 62 Henderson et al.(2018).
 63 World Bank (2009).
 64 See Barro and Sala-I-Martin's and Bairro et al.'s (1995) seminal work on this topic. Our work is not the first to use nighttime light as an instrument to empirically test convergence. Gennaioli et al. (2015) and Chandra and Kabiraj (2020), for instance, also use nighttime light to explore how lagging regions may catch up to more advanced regions and find strong evidence of convergence.

1.4.2 Distance (Lack of Connectivity)

Closing connectivity gaps in the Lake Chad region can lead to higher productivity and higher-quality jobs, particularly in rural areas, where people are twice as likely to be disconnected from main roads, and thus from access to markets and economic opportunities.

The Lake Chad region suffers not only from a lack of density, but also from long distance or lack of connectivity to the rest of the countries or to the neighboring countries. *Distance* refers to the ease or difficulty for goods, services, labor, capital, information and ideas to traverse space. It measures how easily capital flows, labor moves, goods are transported, and services are delivered between two locations. In this sense, distance is an economic concept not just a physical one, related to connectivity and access. An area is more likely to be lagging the farther away it is from leading areas since greater distance-to density implies a lack of integration into the economy. It also implies poorer access to the “thick” markets of capital, labor, goods, services and ideas, and the spillovers of knowledge and information they provide. As highlighted in this section, the Lake Chad region exemplifies an area that lacks access to major markets due not only to its landlocked geography but also due to poor connective infrastructure and intensifying conflicts that make the flow of people and goods across the region extremely costly.

1.4.2.1 Market Accessibility

Rural people in the Lake Chad region are twice as likely to be disconnected from all-season roads (motorable year-round), compared with areas in the rest of the

countries. The score of the rural access index—that is, the share of rural population living within 2 kilometers of an all-season road—is low for the region (Map 1.11, panel a).⁶⁵ Nearly two-thirds of about 60 percent of the rural population in the Lake Chad region live farther than 2 km away from an all-season road (proxied by *OpenStreetMap*), that is, about twice the share in the non-lake parts of the basin countries (about 30 percent).

Conflict and border closers have further distanced rural populations from the market. For example, take-home profits for small producers and sharecroppers reduced by about 80 percent before and after the Boko Haram crisis and its associated border closures.⁶⁶ Sales volumes have decreased while the cost of agricultural inputs has risen (as cheaper Nigerian imports are not available and small farmers are unable to cross the river to purchase small amounts). As a result, the crisis has decreased the potential of the dried red pepper market to act as a source of income for producers, and as a source of employment, where producers report having to lay off daily laborers and having less ability to offer sharecropping opportunities to the poor.

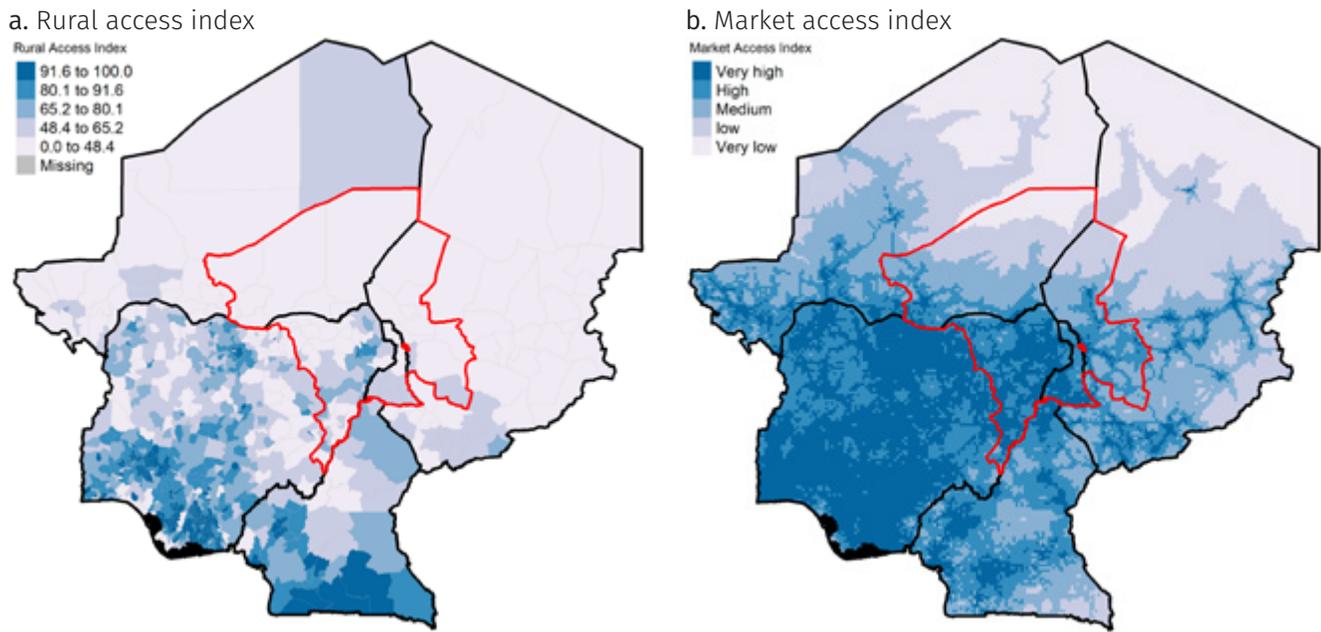
The Lake Chad region and its vicinities host several key cities (Maiduguri in Nigeria, Maroua and Kousséri in Cameroon, N'Djamena in Chad, and Diffa in Niger) that can serve as trade hubs for driving the regional economy. The Market Access Index—a measure of the size of population that can be reached within a certain travel time⁶⁷—is relatively high in the Lake Chad region compared with some other parts of the countries (Map 1.11, Panel B). This indicates that, with proper connective infrastructure, people in the Lake Chad region could benefit from economic opportunities that large markets—both within and around the region—can offer. Road transportation connects some key local agricultural markets in and around the Lake Chad

65 An “all-season road” is defined as a road that is motorable all year round by the prevailing means of rural transport. Trunk, primary, secondary, and tertiary roads in *OpenStreetMap* are used as a proxy for all-season roads following the methodology by Azavea: <https://rai.azavea.com/>.

66 Sissons, Corrie and Clotilde Lappartient. 2016. “A Modified Emergency Market Mapping Analysis (EMMA) and Protection Analysis: Smoked Fish and Dried Red Pepper Income Market Systems - Diffa Region, Eastern Niger.” Oxfam GB, Oxfam House, John Smith Drive, Cowley, Oxford, OX4 2JY, UK.

67 Estimated travel time to the closest city with a population of 500,000 or greater.

Map 1.11: Market and rural access in and around the Lake Chad region



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report.

Note: Panel a shows the rural access index or the share of the rural population who live within 2 kilometers of all-season roads as proxied by OpenStreetMap. See appendix B for details on the construction of the index. Panel b shows areas that score very high (top 20 percentile), high (20–40 percentiles), medium (40–60 percentiles), low (60–80 percentile), or very low (bottom 20 percentile) in the market access index. See appendix B for details on how the index is calculated.

region, including (a) Bol and N’Djamena in Chad, (b) Kousséri in Cameroon, (c) N’Guigmi and Diffa in Niger, and (d) Bosso, Niger, along with Marte and Monguno via Madiguri in Nigeria. Maiduguri is an important connection for the trade corridors between Nigeria and Cameroon.⁶⁸ Yet, due to security concerns, many roads remain closed and border restrictions also further limit the movement of people and goods across the region—a topic that is discussed more in details in Section 1.4.3.

1.4.2.2 Poor Road Infrastructure

Poor road infrastructure—compounded by insecurity—undermines both intra- and inter-regional connectivity. Connectivity across borders (or between cities within national boundaries) is poor due to insufficient road infrastructure and a volatile security situation, which make trade and transportation of goods

costly. Access to the Lake Chad region from the exterior is at best poor, aside from a paved road in Chad (N’Djamena to Karal), which is barely functional. The conditions of travel within and between the areas surrounding the lake are also difficult because of invasive vegetation on the body of water, which obstructs navigable channels, and due to the lack of maintenance of rural roads. The northern basin and the north-east archipelago are landlocked, which slows down the diversification and intensification of the farming economy. Additionally, insecurity is reported as one of the main causes of concern for transporters, alongside the quality of road infrastructure, and excessive checkpoints and payments on routes.⁶⁹ Better connectivity and mobility within the Lake Chad region—and also between the region and other areas of the countries—have the potential to improve the living conditions of the population, by improving access to basic services, jobs, and markets.

⁶⁸ See Appendix 1.A for a map of local markets in the region.

⁶⁹ WFP (2016a, 2016b).

1.4.2.3 Digital Connectivity

In addition to physical disconnectivity due to a lack of sound road infrastructure, the Lake Chad region also suffers from digital disconnectivity, further isolating the region not only from the rest of the Lake Chad Basin countries and also from the rest of the world.

Access to the Internet is also limited in the Lake Chad Basin countries. While digital infrastructure in Sub-Saharan Africa as a whole is lagging behind compared with the rest of the world,⁷⁰ the Lake Chad countries have a particularly low level of internet penetration. Approximately 12 percent of the population in the Lake Chad countries reported using the internet, compared with 19 percent across Sub-Saharan Africa, on average.⁷¹ There is heterogeneity within the region. Chad lies among the countries with the lowest internet penetration rates in the world, at 7 percent of the population, compared with Cameroon, which at 23.2 percent ranks above the regional average.

Mobile internet in the Lake Chad Basin countries has undergone a rapid expansion, although its pace still lags regional leaders like South Africa. Unique mobile internet subscribers across the Lake Chad Basin countries increased almost twofold as a share of the population between 2014 and 2020.⁷² In 2020, this figure stood at 31 percent of the population, above the regional Sub-

Sahara African average of 28 percent. However, the share of unique mobile internet subscribers in Lake Chad countries remains substantially below regional leaders, such as South Africa (52 percent). Chad registered a unique mobile internet subscription rate of 17 percent of the population in 2020, compared with 34 percent in Nigeria and 34 percent in Cameroon. On the other hand, Niger has the lowest mobile internet penetration rate across the Lake Chad region, and among the lowest in Sub-Saharan Africa. It is important to identify the main constraints to adopt internet services faced by individuals to fully harness the potential benefits of digital technologies in the region.

Digital infrastructure—mobile broadband internet in particular—is limited in the Lake Chad region.⁷³

A large swath of areas in the Lake Chad region have little connectivity to fiber optics transmission nodes or 3G technology except for the Far North Region of Cameroon where there appears to be more comprehensive coverage.⁷⁴ Access to the internet (either through fixed broadband or mobile broadband) can serve as a catalyst for poverty alleviation,⁷⁵ improved labor outcomes⁷⁶ and the functioning of rural markets,⁷⁷ specifically regarding price information, access to inputs and consumers⁷⁸ and access to capital markets.⁷⁹ Thus, together with a lack of physical connectivity, poor digital connectivity presents

70 World Bank (2019a).

71 Data of 2017, WDI (World Development Indicators) (database) (accessed on 04/07/2021), World Bank, Washington, DC, <https://datatopics.worldbank.org/world-development-indicators/>. Internet users are individuals who have used the internet (from any location) in the last 3 months. The internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.

72 Given that consumers may use multiple SIM cards to take advantage of discounts or to avoid high charges for off-network calls, market penetration in terms of unique subscribers may provide a better picture of the degree of access to mobile services. GSMA defines mobile internet as the use of internet services by unique users on mobile devices at the end of a given period. Mobile internet services are defined as any activity that uses mobile data (that is, excluding SMS, multimedia messaging services, and cellular voice calls). See GSMA Intelligence (database), Global System for Mobile Communications (GSM Association), London, <https://www.gsmainelligence.com/>. Accessed on April 7 2020.

73 Hjort and Poulsen (2019).

74 The nodes correspond to add or drop points (entrance or exit) in the long-haul fiber networks. Long-haul fiber networks are like motorways that have junctions (on and off ramps, that is, add and drop points) that feed smaller class roads (access fiber, wireline, and wireless networks). In the motorway scenario, even if a household is located close to the motorway, it may be a long drive to the nearest junction. The same applies to fiber-optic networks, in which the speed of fixed broadband Internet is determined by proximity to the transmission nodes rather than the network lines connecting the nodes. While second-generation (2G) technologies enable voice, SMS, and limited Internet access, third-generation (3G) technologies enable more rapid Internet browsing and data downloading. The 2G/3G coverage data should be treated with caution, however; see the note to map 1.12.

75 See Bahia et al. (2019) and Masaki et al. (2020).

76 See Hjort and Poulsen (2019); Paunov and Rollo (2014); Fernandes et al. (2019); Chun and Tang (2018); Viollaz and Winkler (2020).

77 See Kaila and Tarp (2019); Goyal (2010); Ritter and Guerrero (2014); Salas-Garcia and Fan (2015).

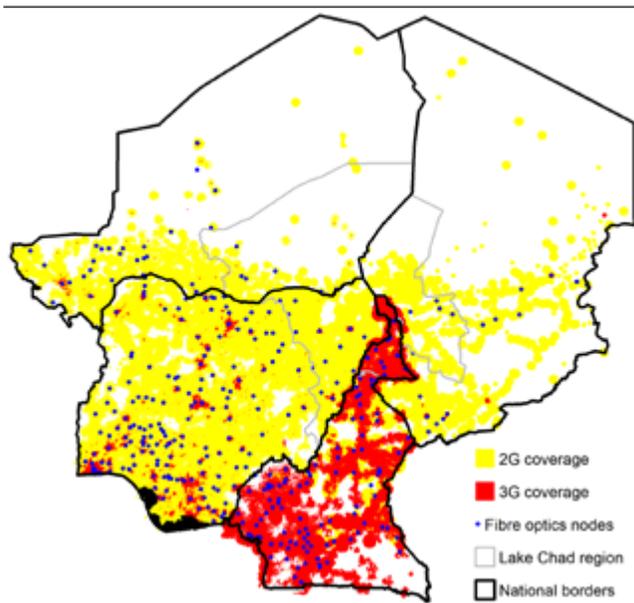
78 See Aker and Mbiti (2010); Aker (2011); Debo and Van Ryzin (2013).

79 See Hasbi and Dubus (2019); Alibhai et al. (2018).

an additional hurdle that prevents the region from tapping its full economic potential.

Not only is access to digital infrastructure limited, ownership of digital devices like cellular phones is also particularly low in the Lake Chad region. Cell phone ownership as a share of population in the areas near the lake in Niger stood at 13 percent compared with 20 percent for the rest of the country. A similar pattern can be seen in Nigeria, where cell phone ownership is 5 percentage points lower in the regions near the lake. Chad is the only exception, where ownership is higher in areas near the lake compared with the rest of the country (20 percent versus 16 percent, respectively).

Map 1.12: Digital connectivity in and around the Lake Chad region (2018–2019)



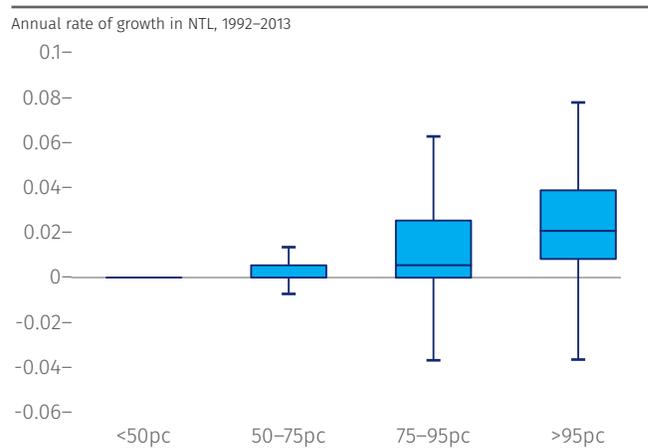
Sources: Africa Bandwidth Maps (dashboard), Hamilton Research, Bath, UK, <http://www.africabandwidthmaps.com/>; Mobile Coverage Maps (dashboard), Collins Bartholomew, HarperCollins Publishers, Glasgow, <https://www.collinsbartholomew.com/mobile-coverage-maps/>.

Note: Mobile coverage corresponds to 2018. Fiber optics correspond to 2019. The 2G/3G coverage data should be treated with caution, however, because the Collins Bartholomew coverage maps do not necessarily include all network providers in each country. Thus, this coverage map should be treated as a lower bound of 2G/3G availability.

1.4.2.4 Reducing Distance to Markets Matters for Local Economic Development

Market accessibility is among the key drivers for regional integration and economic growth. Areas that are better connected to large markets experienced a faster rate of growth than other areas (Figure 1.13).⁸⁰ Controlling for the initial level of nighttime lights and population size as well as other socioeconomic and geographic factors (as shown in Figure 1.12), market access is indeed one of the main determinants of local growth (approximated by the intensity of night lights) in the four Lake Chad countries as well as within the Lake Chad region itself (the areas surrounding the lake).

Figure 1.13: Market accessibility index and regional growth



Source: Masaki and Rodríguez-Castelán 2021, technical paper for this report. Note: Excludes outside values. The results are based on the beta-convergence regression where the dependent variable is the annual rate of growth in nighttime light luminosity between 1992 and 2013 and regressed on a number of socioeconomic, demographic, and geographical variables. The analysis is performed based on the sample of 5,212 grid cells (at a spatial resolution of 0.1 degrees) defined over the Lake Chad Basin countries that were lit (with a positive digital number in nighttime light luminosity) at some point between 1992 and 2013.

Connectivity to regional hubs like N’Djamena and Maiduguri appears to be particularly important for growth in agriculture and livestock trade. For instance, fish routes were still supplying several tons of produce to the regional hubs of N’Djamena and Maiduguri with an annual estimate of 50,000 to 100,000 tons of fish

80 These results are drawn from Masaki and Rodríguez-Castelán (2021), technical paper for this report.

per year between 2010 and 2014.⁸¹ As noted above, the livestock trade is vital for the region and crossborder trade has long played a role in trade in livestock markets in Africa.⁸² Traditionally, livestock trade routes from Chad and Niger pass through Maiduguri on the way to regional markets.⁸³ Sixteen out of 97 large livestock markets in the four countries are located nearby Lake Chad, while more than half of the livestock markets are within 100km of the border.⁸⁴

Improved access to markets serves to expand agricultural activities. An analysis of access to markets and land cultivation using over three decades of remotely sensed and geospatial panel data shows that an increase in market access is associated with an increase in cultivated land.⁸⁵ Given the modest gain in length of paved road, the growth in population, which is a proxy for the size of the market, is the main driver for the increase in market access. A 1 percent increase in market access is associated with a 3.9 percent increase in cropland area. Given the approximate total of cropland in the four countries is nearly 600,000 km², this result implies a growth of around 23,400 km² given a 1 percent increase in market access over 9 years.⁸⁶

The positive impact of market access on agricultural activities is constrained by conflict and insecurity. As discussed above, market access is associated with an increase in cropland area. This result, however, does not incorporate short-term shocks or uncertainty in traveling to markets, especially related to conflict.⁸⁷ Indeed, the same analysis shows that areas that are closer to conflict events experience slower cropland expansion over the

entire region.⁸⁸ These findings imply that investments in enhancing connective infrastructure to improve market access for the Lake Chad region does not guarantee gains in agricultural expansion unless such investments are made in tandem with complementary policies to secure peace and security in the region or at least mitigate the negative impact of conflict.

Better access to connective infrastructure in the Lake Chad region is also associated with a shift away from agricultural jobs. Using data on the expansion of infrastructure and the sectoral composition of employment at the subnational level, the analysis⁸⁹ shows that access to paved roads is linked with diversification away from agriculture in the Lake Chad region. More substantively, having access to paved roads is associated with a 6 percentage point reduction in the employment share of agriculture, and a 4 percentage point increase in the employment share of manufacturing and a 2 percentage point increase in the employment share of services. These effects are even larger in the districts neighboring Lake Chad, where having access to a paved road at the district level is associated with a 13 percentage point reduction in the employment share of agriculture, a 8 percentage point increase in the employment share of manufacturing, and a 5 percentage point increase in the employment share of services. In particular, road connectivity appears to have particularly significant impact in Cameroon, where access to paved roads is associated with a reduction in agricultural employment by 12 percentage points and roughly a 6 percentage point increase in both manufacturing and service sector employment, respectively.

81 Lemoalle and Magrin (2014).

82 de Haan et al. (1999).

83 WFP (2016a, 2016b).

84 Blankespoor (2021), technical paper for this report.

85 Specifically, the panel includes the following years: 1983, 1992, 2001, 2010 and 2019.

86 The harmonized night light series includes both the Defense Meteorological Satellite Program–Operational Line-Scan System and Visible Infrared Imaging Radiometer Suite satellites.

87 Travel time assumes the fastest route and does not include any measures of delays or roadblocks. Conversely, Van Der Weide et al. (2018) incorporate road closure obstacles in the travel time analysis to quantify the impact of market access on local GDP in the West Bank.

88 Blankespoor (2021), technical paper for this report.

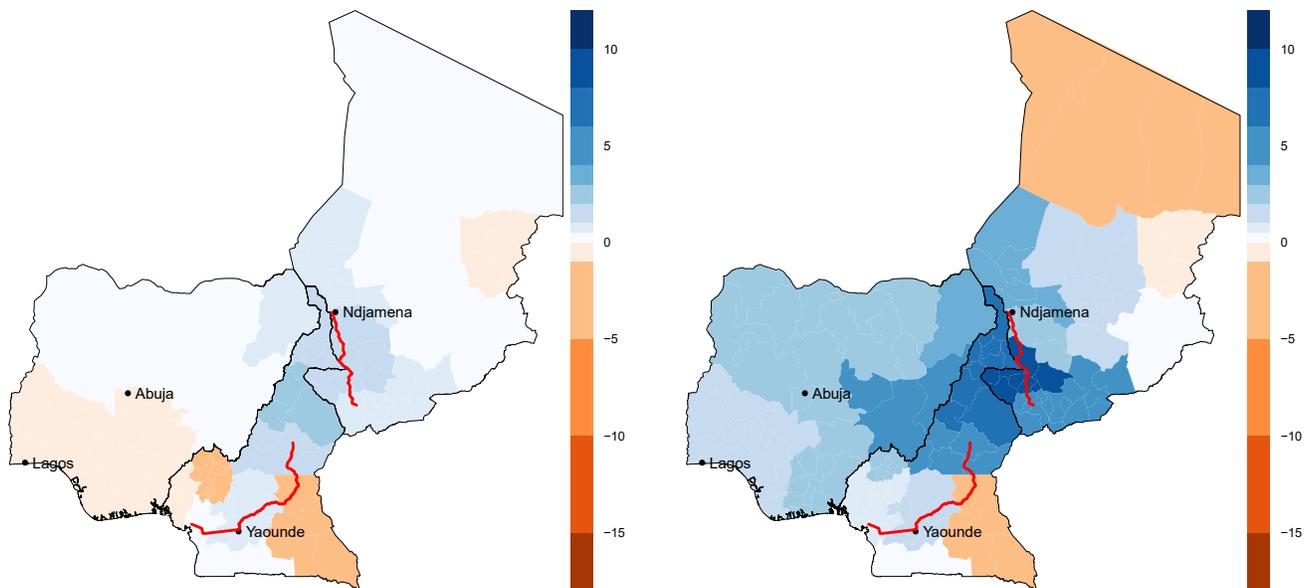
89 The results presented in this section are taken from Lebrand (2021), technical paper for this report.

While structural transformation may directly contribute to poverty reduction in the long run, its impact may be more nuanced in the short run. As noted above in this report, despite having a relatively high share of non-agricultural employment, parts of the Lake Chad region of Nigeria and Cameroon still have relatively high poverty rates. A transition away from agriculture per se does not necessarily guarantee immediate poverty reduction and complementary policies and investments are also needed to increase productivity for farmers—which still account for a disproportionate number of the poor in the region.

Overall, the welfare effects of the new transport corridors are positive but modest unless combined with complementary policies to reduce border frictions. Map 1.13 graphically shows the estimated welfare gains from two pipeline infrastructure investments financed

by the World Bank: i) an alternative road transport corridor to Chad; and ii) the rehabilitation of the rail line in Cameroon.⁹⁰ The alternative road corridor links N'Djamena, the capital of Chad, with Moundou, the second city in Chad and Ngaoundéré in Cameroon.⁹¹ The investment project of the rail line in Cameroon consists of the renovation of the main rail line between Ngaoundéré, Yaoundé and Douala. Overall, those two transport corridor projects alone would not expect to yield substantial welfare gains without any complementary policies to reduce crossborder frictions. When combined with a reduction in crossborder frictions, regional real income (i.e. the sum of real incomes for the entire population in a given region) is expected to increase—particularly in areas within the Lake Chad region where the overall welfare gain is estimated to be around a 5 percent increase in the overall real income of people living in the region.

Map 1.13: Regional welfare impacts from transport corridor investments (left) with additional border reduction (right) - percentage change in regional welfare.



Source: Lebrand 2021, technical paper for this report.

Note: The maps show the welfare impact of the two proposed infrastructure investments with and without complementary policies to reduce border-crossing time by half. The model used to estimate expected welfare effects from the proposed infrastructure investments consider the combined effect of those investments with a reduction in travel time for crossing borders. The model assumes the effect of halving border-crossing time from 30 hours to 15 hours.

90 The model does not consider investments in electricity and internet. The plan for future research is to include those infrastructure sectors in the model and link it with the empirical analysis.

91 Because of insecurity in the Far North, road transporters now opt for this alternate route (rather than the more direct route through Maroua and Kousséri) and therefore the corridor is in need of investment to sustain the increase traffic. In 2015 alone approximately 500,000 tons of goods passed through this corridor compared with 40,000 tons through the previous corridor (CPCS-EGIS, 2019).

1.4.3 Division

The historically strong crossborder trade around Lake Chad has been disrupted by the Boko Haram conflict, a source of division in the region. Yet, regional trade shows signs of resilience, and exploiting further trade opportunities could have a direct positive impact on household incomes and employment.

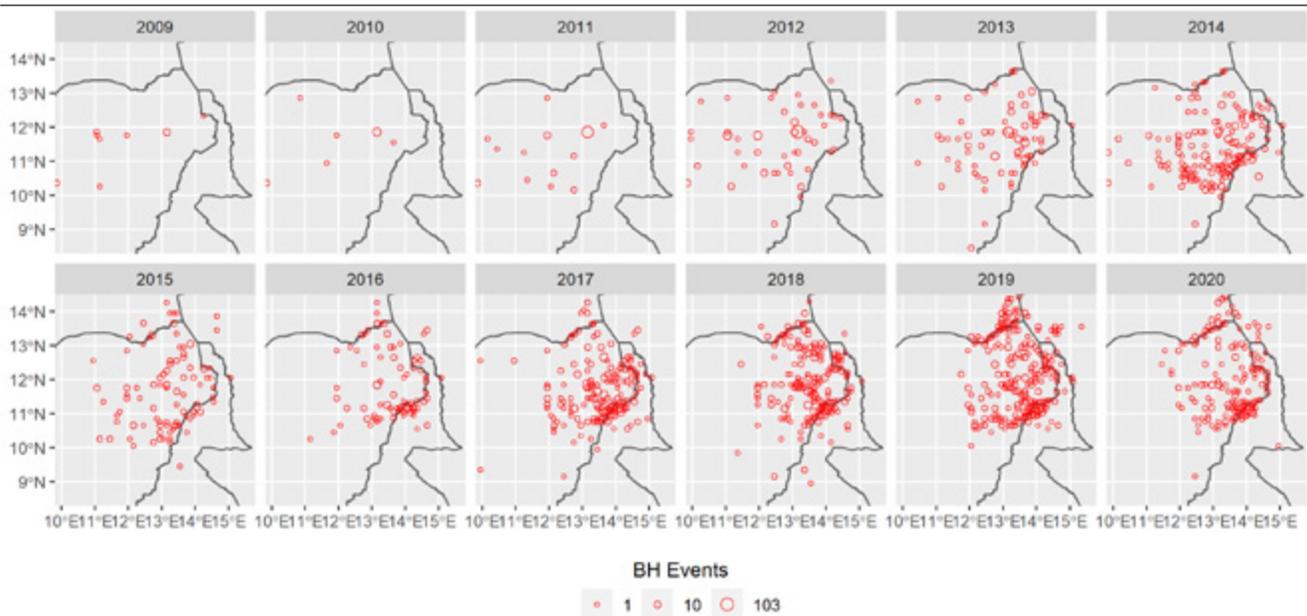
Together with density and distance, the third important geographic dimension for territorial development is division. It applies at both national and international scales. At the national scale, nations can be internally divided due to conflicts and tensions arising from linguistic, ethnic, religious, cultural, or political divisions. At the international level, divisions mainly arise from so-called thick borders, i.e., the many restrictions countries impose on other countries regarding the flow of goods, capital, people and ideas.⁹² Thick borders limit trade and the flow of factors of production. Interstate conflict

creates the thickest borders. While borders in the rich world have become increasingly thin, hereby facilitating trade and the movement of people and capital, borders in many developing countries remain thick, as is generally the case in the Lake Chad region. At the same time, borders in the areas around Lake Chad have historically been characterized as relatively porous—with trade and social ties permeating borders. This mobility, however, has subsided over the last decade with the hardening of borders and counterinsurgency measures as a response to the Boko Haram insurgency.

1.4.3.1 Boko Haram

The intensification of conflict in the Lake Chad region since the rise of Boko Haram in 2009 has been a large source of division driving the laggardness of the region. While the group was first founded in 2002, the insurgency is considered to have begun in full in 2009 in Nigeria. In 2014–15, it expanded into northern Cameroon, Niger and Chad. Since then, the group has retreated into inaccessible

Map 1.14: The evolution of the number of Boko Haram violent events from 2009–2020



Sources: Blankespoor (2021), technical paper for this report. The elaboration is based on ACLED (Armed Conflict Location and Event Data Project) (dashboard), Robert S. Strauss Center for International Security and Law, Austin, TX, <http://www.acleddata.com/>.

92 Fratianni and Kang (2006).

areas, mainly along the borders, but has continued to carry out more frequent and sophisticated attacks.⁹³ Boko Haram has been aligned with the Islamic State of Iraq and the Levant since 2015.⁹⁴ It is not a unified group; in 2016 it split into two factions: the Islamic State’s West Africa Province (ISWAP) and Jama’atu Ahl al-Sunnah lil-Dawa wal-Jihad (JAS).⁹⁵ At its peak—that is between 2010 and 2015—the group seized a large swath of territories in Nigeria’s North East, including major cities, pushing the government of Nigeria to declare a state of emergency (an action that was later followed by other governments in the region). While most of the attacks between 2009 and 2013 were geographically concentrated in a few states in the northeastern corner of Nigeria, the terrorist group moved some of its activities to the neighboring areas of Cameroon, Chad, and Niger (Map 1.14). Vigilante groups have been created in response to the insurgency, and these are becoming increasingly violent.

1.4.3.2 Crossborder Trade Barriers

The Lake Chad Region has historically been characterized as a system of (mainly informal) regional and crossborder trade. The Lake Chad region is heavily dependent on trade flows from neighboring areas, as a landlocked area that is more than 1,300 km away (in the case of Maiduguri) from the main ports of Cameroon and Nigeria. Economic interdependence has historically manifested in strong (though largely unrecorded and informal) crossborder trade.⁹⁶ Trade flows straddle the Lake Chad region both from east to west and north to south. The region serves both as a transit corridor as

well as a site of strong domestic trade in local (mostly agricultural) productions. Trade, however, has historically been informal in the region, with official trade figures tending to underestimate actual flows. A recent study, for instance, suggests that Nigeria exported more than 213,000 metric tons of nonfuel products to Cameroon annually, i.e. over forty times the official estimates.⁹⁷ The crossborder trade largely took place between the two largest cities in the area, N’Djamena in Chad and Maiduguri in Nigeria, across secondary cities such as Maroua in Cameroon and Yola in Nigeria, as well as between a growing number of smaller towns and market towns.⁹⁸ There are also important trade flows between Zinder in Niger and Kano in Nigeria. Official crossborder trade is the main source of public revenue collected locally for landlocked countries: tax revenue collected by customs funds most of the public services (including salaries of civil servants, in some cases).⁹⁹

Regional integration through crossborder trade has been severely disrupted by road/border closures associated with the Boko Haram insurgency.¹⁰⁰

Both crossborder and inter-regional trade have been substantially affected by the conflict. In Nigeria and Cameroon, most trade took place through the corridor connecting Maiduguri in Borno State in Nigeria to Kousséri or Maroua in Cameroon’s Far North Region.¹⁰¹ The lack of border infrastructure also constrains crossborder trade. The only international city-to-city crossing is between Kousséri in Cameroon and N’Djamena in Chad; while most manufactured goods in Chad tend to arrive by road from Douala in Cameroon. Intensification of the conflict since 2009, as well as the

93 Magrin and Perouse de Montclos (2018).

94 Vivekananda et al. (2019).

95 The indiscriminate targeting of civilians appears to have been a major point of disagreement. The extremist group ISWAP avoids harming civilians, focusing mainly on military and government targets (Samuel 2019).

96 See Magrin and Pérouse (2018).

97 World Bank (2013a).

98 Magrin and Pérouse (2018).

99 This claim was made regarding landlocked countries: Chad, Mali, Niger and CAR, in contrast to Cameroon and Nigeria: “*le commerce transfrontalier est la principale source de revenus publics perçus localement: les recettes fiscales collectées par les douanes alimentent la majeure partie des activités des services publics (y compris les salaires des fonctionnaires dans certains cas)*” WCO (2018).

100 WFP (2016a, 2016b).

101 Magrin and Perouse de Montclos (2018).

closing of land borders in Nigeria since 2019, and the state of emergency declared in Diffa and the Lac region in Chad also in 2019 disrupted this trade flow. Banditry and armed attack threaten the trucking routes, reducing the circulation of vehicles. In the few places where physical border control exists, ‘thick borders’ arise due to conflict and insecurity¹⁰²—suicide bombings occur regularly by pedestrians heading to the market, drivers of taxi motos, even by children entering schools. Since Boko Haram and its splinter groups tend to be viewed regionally as a Nigerian problem, security and surveillance are largely concentrated along terrestrial borders with Nigeria.¹⁰³

Conflict and insecurity in the region have also raised the cost of regional trade. A survey of 305 transporters undertaken on behalf of the World Food Programme in 2016 found that banditry and insecurity became the main cause of concern for transporters in two of the four countries and the second constraint in Cameroon and Niger behind road infrastructure, which also ranks high in Chad and Nigeria, offering a reminder that transport was never easy in the region.¹⁰⁴ The same survey found that, with the crisis, supply routes for cereals in Borno State became subject to a particularly high number of checkpoints (every 15 km) and a high total amount of payments, as in other regions, such as Diffa in Niger. Country policy decisions also continue to interfere with trade such as the recent decision by Cameroon to ban exports of cereals to neighboring countries.¹⁰⁵

Conflict has significantly shifted the pre-crisis trade routes. A study for the Lake Chad Governors’ Forum discusses the resulting shifts in trade patterns.¹⁰⁶ The use of major roads in the Borno State has been restricted¹⁰⁷, with the situation only partially improving since 2015. The overall volume of traded goods and services appears to have declined. However, alternative functional trade routes emerged.¹⁰⁸ In these, trade has shifted away from the Borno State to safer courses through Niger and Cameroon.¹⁰⁹ These routes, however, are often costlier in terms of time and distance.¹¹⁰ Displacement of trade also has complex effects in terms of redistribution of economic activities. The corridors between Nigeria and Cameroon South of the Far North Region in Cameroon will benefit from the increased activity that has left the corridors of with Maroua and Kousséri. On the other hand, the displacement of cattle herds to the Adamawa and Northern regions of Nigeria and Cameroon, fleeing insecurity in the Far North (and conflict in English-speaking regions), create potential source of conflict between farmers and herders as competition for resources increases.¹¹¹

In addition to the direct negative impact of Boko Haram on regional trade, counterinsurgency measures adopted by the governments—such as border and market closures—have also stymied the movement of people and goods in the region.¹¹² Douala is the closest maritime port to the capital city of N’Djamena, with approximately 79 percent of imports passing through the

102 Porous borders attract informal cross border trade (ICBT) both to save on customs duties and to avoid security forces concentrated at official crossings to check vehicles and inspect declared goods. When ICBT shifts to open land and nighttime crossings, insurgents often follow, looking to extort protection payments or confiscate goods. It is argued that the frequency of border attacks by insurgents may also be stimulated by the absence of security forces, due to poor resource allocation and funding.

103 WCO (2018).

104 WFP (2016a, 2016b).

105 Data on Cameroon, FEWS NET (Famine Early Warning Systems Network) (dashboard), FEWS Net, Washington, DC, <https://fews.net/>.

106 Caestens (2019).

107 An estimated 750 commercial vehicles were attacked by armed groups mainly in Borno (Mercy Corps et al. 2017).

108 Sissons and Lappartien (2016) report that traders had to take alternate routes instead of the direct 125 km route between Diffa and Maiduguri, the main market for red pepper in Northern Nigeria, resulting in an increased distance of 430 km for traders (in the best of case).

109 Two of these routes suitable for crossborder exchange are between Yobe State in Nigeria and Diffa in Niger (Geidam/Nguru – Diffa) and between Adamawa State in Nigeria and Garoua in Cameroon (Yola/Mubi – Garoua).

110 World Bank (2018).

111 Data on Cameroon, FEWS NET (Famine Early Warning Systems Network) (dashboard), FEWS Net, Washington, DC, <https://fews.net/>.

112 Magrin and Perouse de Montclos (2018).

port.¹¹³ However, the deteriorating security situation on the Northern segment of the Douala-N'Djamena corridor has been a serious concern for transport operators, who have explored the use of alternative transport routes. The road that avoids the Far-North of Cameroon, going through the Chadian territory has gained interest and traffic, and the Chadian authorities and their developing partners are considering upgrading the road.¹¹⁴ Instead of going from Ngaoundéré via Garoua and Maroua (Cameroon) to N'Djamena, the new corridor would run from Ngaoundéré East to Koutéré (Cameroon) and then continue North to Moundou (Chad) and N'Djamena (about 600 km). Parts of the road still need to be reconstructed or rehabilitated to make this alternative branch capable of sustainably handling the substantial increase in traffic.

While crossborder trade has decreased as consequence of conflict, it shows signs of resilience, including through the strength of social networks. The extent of economic interdependence among the different areas of the Lake Chad region is manifested in (mainly unrecorded) strong crossborder trade. While the volume of goods and services traded has been impacted by the security situation, some trade routes remain functional and new ones have emerged, as outlined above. The networks of family relationships, inter-connected border communities, and local alliances have bypassed many of the official restrictions on trade and movement of people, as well as conflict areas, and so borders in the Lake Chad region remain relatively permeable. The social structure of local traders has been noted as beneficial to their adaptation to the conflict, including by negotiating new trade routes with state officials. For example, Bol traders in Chad routinely send someone to foreign ports or cities to trade on behalf of other traders, and they consolidate their cargoes by means of transport. When the presence of Boko Haram led to the end of the circulation of boats on

Lake Chad, Chadian traders went to the Niger customs to negotiate the way in which their goods—which would now transit through Niger on their way from Nigeria to Chad—should be declared.¹¹⁵

Enhanced crossborder trade can have positive effects on income and employment, particularly if it builds on the existent strong informal trade. Crossborder trade provides basic needs to populations living far from capital cities and national points of entry. People living in the areas surrounding Lake Chad are characterized by having strong trade, ethnic, cultural, and political ties, making these administrative areas economically interdependent. Exploiting opportunities for crossborder trade is likely to have a direct impact on incomes and employment in the region, particularly if the extensive informal trade relations can be capitalized on. The growth of regional value-chain, especially in agricultural products and food processing, could be a key mechanism for enhancing economic opportunities within the region and beyond. Currently, poor trade facilitation and weaknesses in institutions, regulations, and monetary policy management exert significant costs on intraregional trade in some countries. For instance, the trucking industry in West and Central Africa is characterized by the presence of cartels offering high prices and low service quality.

Smuggling is commonplace in the Lake Chad region. Smuggling tends to occur in border zones, particularly where varying levels of subsidies and tax regimes exist between borders. One of the forms of contraband is based around the subsidized price differentials of commodities between oil-producing states and their neighbors, in the form of trade from North African states to communities along their southern borders in Chad, Niger and Mali.¹¹⁶ Illegal smuggling has an added economic incentive where import duties are high, often the case in resource-poor countries neighboring large petroleum producers.¹¹⁷ Even

113 Taniform (2014).

114 United Nations and World Bank (2018).

115 WCO (2018).

116 Shaw and Reitano (2014).

117 For descriptions of this dynamic in the Maghreb, please refer to Ayadi et al. (2014).

margins on licit consumer goods can be significant. Fuel sold in Nigeria is subsidized, which reduces its price and makes its trafficking to neighboring countries attractive. Fuel trafficked out of Nigeria is also sourced from millions of liters of crude oil either stolen or diverted to be refined in artisanal distilleries. This fuel feeds contraband, both nationally and regionally, to the neighboring countries.¹¹⁸ Furthermore, smugglers of small quantities of black-market gasoline tend to be profiled as Boko Haram enablers and are detained or arrested.

118 Assanvo et al. (2019).

1.5 Climate Change and FCV challenges

More frequent climate anomalies—rising temperatures, and aridification in particular—are associated with a rise in conflict activities in the region.

Territorial underdevelopment—rooted in low economic density coupled with high distance and division (3Ds)—is intricately linked to another layer of risks that are characterizing the region: conflict and climate change (2Cs). On the one hand, suboptimal territorial development can be a direct source of fragility and conflict. A well-established body of literature exists that highlights the primary role that poverty and low economic development play in fueling conflict and instability.¹¹⁹ On the other hand, conflict and fragility also perpetuate underdevelopment, the feedback loop that is commonly referred to as a conflict trap.¹²⁰ The ongoing conflict in the Lake Chad region can also be seen as a manifestation of long years of underdevelopment.¹²¹ Furthermore, increasingly erratic climate conditions in the Lake Chad region have intensified competition for limited resources and triggered conflict and violence, which have in turn stymied the economic progress of the region.¹²² As highlighted in the analytical framework (Figure 1.1), it is this nexus between suboptimal territorial development and deepening fragility and climate risks that entrenches the laggardness of the region.

1.5.1 Climate Change and Harsh Environmental Conditions

The Lake Chad region has historically been subject to various climatic and environmental risks, such as recurrent droughts, rising temperatures and increasingly erratic rainfall patterns. Between the 1960s and the mid-1990s, the Lake Chad shrank due to severe and recurrent droughts, which resulted in lost economic opportunities and displacement of people in search of new ways of life.¹²³ Looking at patterns of climatic conditions over the past two decades, there is a sign of rising temperature in the Lake Chad region (Figure 1.14).¹²⁴ Across the Sahel, temperature is increasing 1.5 times faster than the global average. Furthermore, temperature is predicted to increase by 0.65–1.6°C and precipitation is estimated to decrease by 13–11 percent in the next two decades (that is, 2016–2025 and 2026–2035) relative to 1961–1990.¹²⁵ Analysis of patterns in the standardized precipitation-evapotranspiration index (SPEI)—which measures the extent to which the amount of rainfall in a given location deviates from its historical average after taking into account the ability of the soil to retain water—reveals that rainfall shortages appear to be increasingly common in the Lake Chad region (Figure 1.15).¹²⁶ These increasingly erratic climate conditions are making the livelihoods of people in the Lake Chad region more uncertain and vulnerable.

Increasingly erratic climate and its impact on the hydrology of the lake present a significant risk to livelihoods and food security across the region. The

119 See, for instance, Hess and Orphanidis 1995; Collier and Hoeffler 2002; Collier et al. 2003; Fearon and Laitin 2003; Sambanis 2004; Blomberg et al. 2006.

120 Collier et al. 2003.

121 Tayimlong 2020.

122 GEOGLAM 2020.

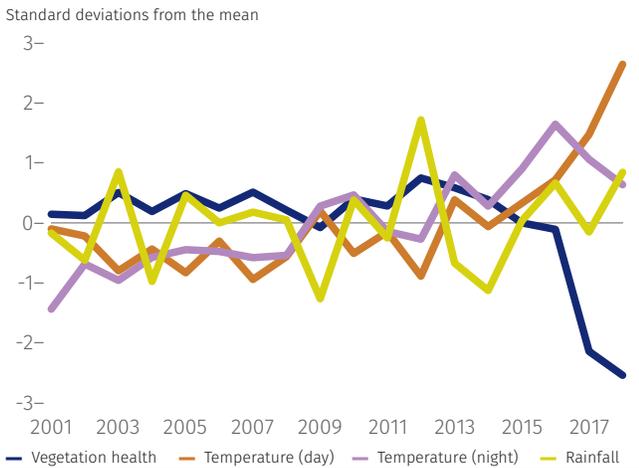
123 Vivekananda et al. (2019).

124 The results presented in this section come from Fisker (2021) “Conflict and Climate in the Lake Chad Region”, technical paper for this report.

125 Mahmood et al. (2019).

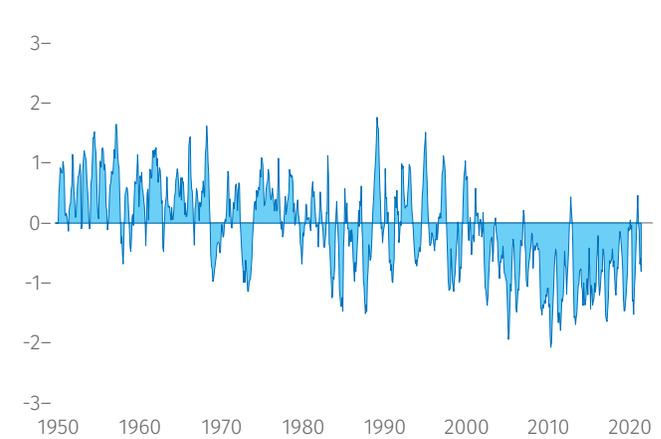
126 The calibration period for the SPEI is January 1950 to December 2010.

Figure 1.14: Trends in vegetation health (NDVI), temperature, and rainfall, 2001–18



Source: Fisker 2021, technical paper for this report; normalized difference vegetation index (NDVI): MODIS (Moderate Resolution Imaging Spectroradiometer) (dashboard), Terra, National Aeronautics and Space Administration, Washington, DC, <https://terra.nasa.gov/about/terra-instruments/modis>; rainfall and temperature: WorldClim, <https://www.worldclim.org/>.

Figure 1.15: Trends in the Standardized Precipitation-Evapotranspiration Index



Source: Fisker 2021, technical paper for this report; SPEI (Standardised Precipitation-Evapotranspiration Index) (dashboard), Spanish National Research Council, Zaragoza, Spain, <https://spei.csic.es/index.html>. Note: The figure shows SPEI values (6 months) over the past seven decades.

Lake Chad region contributes to the food security of 13 million people within a range of 300km, considering connections with regional towns¹²⁷ and the Sahel region as a whole, which relies on resources from Lake Chad.¹²⁸ Droughts and human activities appear to have altered the hydrology of the lake through stream flow modification and water diversion¹²⁹, contributing to the water scarcity and fragility of the region.¹³⁰ Droughts can challenge agricultural production (in addition to being linked with increases in violence against civilians).¹³¹ The fluctuations in inter-annual and seasonal water can also impede the development of stable resources exploitation rights and the administrative management of a transboundary resource.¹³² Uncertainty over the timing, longevity, and strength of rainfall has coincided with increasing temperature and wind speeds.¹³³ These shifts are making it more difficult to understand what land is suitable for agriculture and pastoralism, and to sustain fish catches. Individuals that rely on the lake for income generation

are unsure of what crops to specialize in, and when to switch from one occupation onto another.

Climate conditions are key determinants of local economic growth in the LCB countries where agricultural remains the most dominant economic sector. Climate conditions play an integral role in determining local economic growth particularly in agrarian areas whose livelihoods rely critically on weather conditions. Between 1992 and 2013, higher-than-normal rainfall amounts had greater positive effects on local economic growth in areas that are largely agrarian (and dependent on rainfall) as indicated by a positive interaction term between the SPEI and cropland density (see Figure 1.12). These findings suggest that the impact of climate shocks is not spatially uniform. Thus, assessing the potential risks that erratic weather conditions may pose to local agricultural economies need to be carefully evaluated.

127 Galeazzi et al. (2017).

128 United Nations and World Bank (2018).

129 Lemoalle et al. (2012).

130 Okpara et al. (2015).

131 Begozzi et al. (2017).

132 Sarch (2001).

133 Vivekananda et al. (2019).

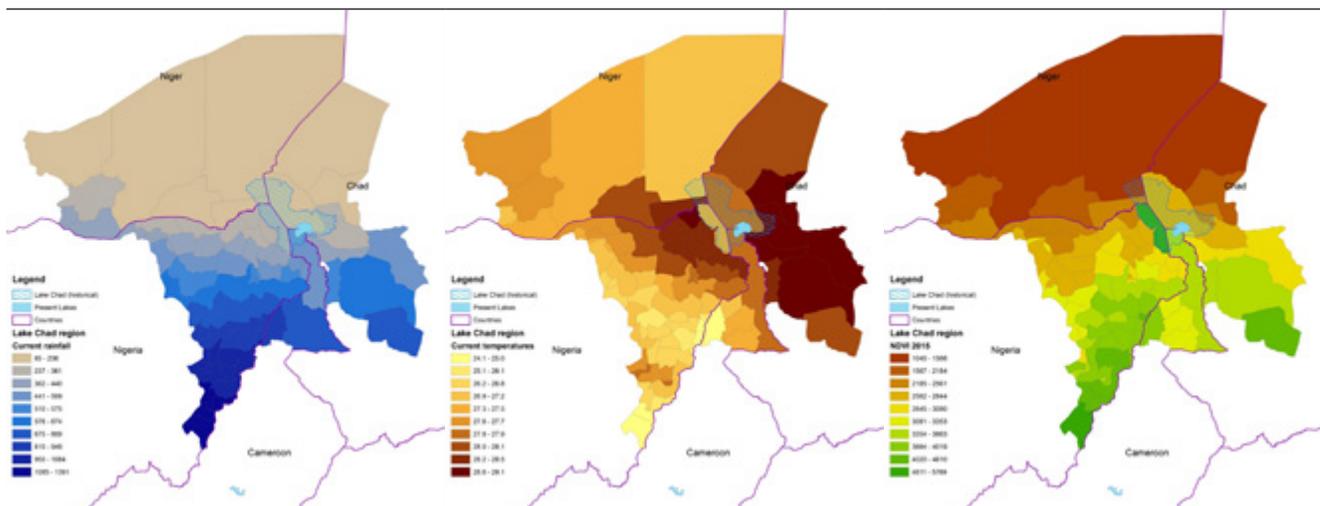
1.5.2 Links between Climate Variability and Conflict

Conflict dynamics and climate change are closely interlinked in the Lake Chad region. There is a well-established body of literature showing the link between violent conflict and climate change. Rising temperatures and increasingly erratic rainfall patterns due to climate change reduce the opportunity cost of fighting by lowering agricultural productivity, weakening state capacity by tightening its fiscal envelope, and intensifying resource competition through displacing people.¹³⁴ In the Lake Chad region, increasingly erratic climate conditions are also directly linked to conflict events.¹³⁵ As shown in Map 1.15, the Lake Chad region is home to a variety of different climate conditions. A large swath of lands in the northern parts of Niger and Chad is characterized largely as a desert, with little annual rainfall. Conversely, the southern parts of the region are home to more vegetation (as indicated by higher values in NDVI), enjoying higher annual rainfalls. These climatic conditions are closely linked to conflict proneness. Based on remote sensing data, the analysis shows that higher-than-usual temperature/rainfall and lower-than-usual agricultural

productivity (proxied by greenness) lead to an increase in conflict activity.¹³⁶ For instance, a positive temperature anomaly of one standard deviation is associated with a 17.6 percentage point increase in the yearly number of conflict events taking place in a given district (at the second level administrative unit). Conflict events are also more likely in areas that experience lower-than-usual levels of greenness, measured by the NDVI (which also means lower agricultural productivity). Here, a negative anomaly of one standard deviation leads to an increase in the number of conflict events of 8.9 percentage points. The effects of climate factors on violent conflict are particularly pronounced in areas that are largely agrarian and more densely populated.

Increasingly erratic climate conditions make communal violence more likely. For example, in Cameroon, livestock transhumance-related conflicts between farmers and pastoralists are an increasing concern in the country's Far North Region. Between November and December 2020, the International Organization for Migration registered more than 320 transhumance conflicts. Insecurity and climate variability have forced shifts in the seasonal migratory routes of transhumant

Map 1.15: Average rainfall, temperatures, and greenness (normalized difference vegetation index)



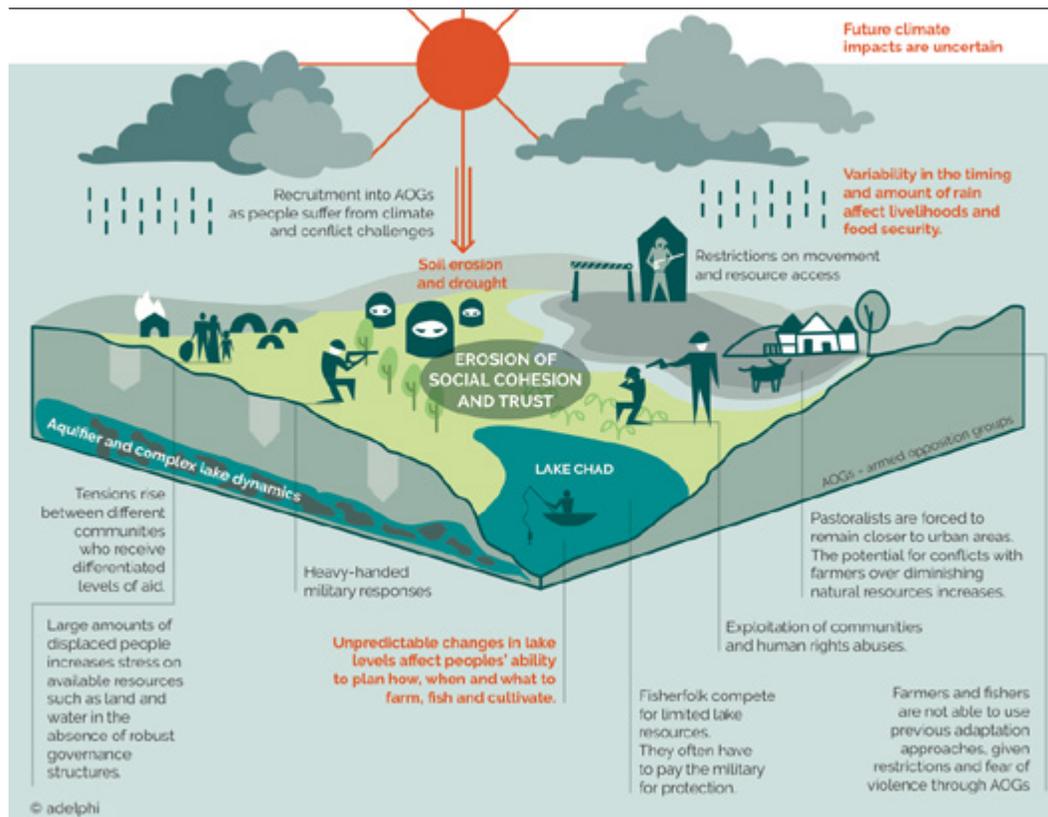
Source: Fisker 2021, technical paper for this report.

134 See Burke and Leigh (2010); Brückner and Ciccone (2011); Chaney (2013); Eberle et al. (2020); Fetzer (2020); Harari and La Ferrara (2018); Hidalgo et al. (2010); Miguel et al. (2004).

135 Onuoha (2014); Vivekananda et al. (2019).

136 The results presented in this section come from Fisker (2021) "Conflict and Climate in the Lake Chad Region", technical paper for this report.

Figure 1.16: The climate-conflict trap



Source: Vivekananda et al. (2019).

movements, which in turn, contribute to fuel the crisis. The International Crisis Group (Africa Briefing 105) has argued that “There is a danger that traditional transhumance will make the crisis worse than it would otherwise have been.” These community-based conflicts have led to the formation of militias to protect resources (as well as to offer protection from armed groups), who are then drawn into conflict themselves.¹³⁷ That said, while it is a potential source of conflict, however, greater mobility can also be a source of resilience, allowing people to move toward available resources, regulating social pressures and generating income by facilitating trade.

Communities in the Lake Chad region are vulnerable to a “climate-conflict trap.” The size and frequency of

extreme and more intense weather events in recent years in Lake Chad is increasing livelihood insecurity and natural resource conflicts and decreasing the coping capacity of individuals and communities to deal with shocks. People are caught between extremes—conditions are too wet or too hot and dry—and those already escaping from violence may be uprooted again by droughts or floods. Agriculture and fishing activities that support most people in the Lake Chad region are increasingly subject to weather shocks, soil degradation, and livestock diseases. Projections indicate that weather conditions will only become more extreme and unpredictable. Moreover, conflict hinders the ability of communities in the Lake Chad region to adapt to climate change, creating a climate-conflict trap that has “fragmented social bonds among families, among

¹³⁷ In Cameroon, the Central African Republic, Mali and Northern Nigeria, militia groups originally created for self-defense have played a strong role in driving conflict (ICG 2018; United Nations and World Bank 2018).

generations, among ethnic groups and between displaced people and host communities, making it harder for people to cope with and adapt to climate impacts than in the past.”¹³⁸

Together, conflict and climate change pose a direct threat to territorial development, and vice versa.

Climate change has made weather increasingly variable within the Lake Chad as well as in the surrounding countries. The highly volatile security situation created by Boko Haram, negatively associated with the pace of local economic growth, poses another significant economic threat. Mitigating security and climate risks should remain among the top priorities for ensuring sustainable growth in the region.

1.5.3 The Social and Economic Effects of Conflict

The Boko Haram insurgency has caused a rapid—and lasting—decline in the level of economic activities across the region, particularly affecting less developed and less connected urban areas.

Despite government efforts to establish peace and stability, the number of conflicts and conflict-related fatalities has been on the rise in the Lake Chad region.

Historical marginalization, exclusion from centers of power and decision-making processes, and a persistent lack of access to services are all structural drivers of fragility in the region, which have made fertile ground for the emergence and expansion of Boko Haram.¹³⁹ The Armed Conflict Location & Event Data Project (ACLED) (Raleigh et al. 2015) records four different types

of conflict: battles, riots, protests and violence against civilians. Based on these data, the findings presented here show that the number of conflicts has increased across all types of conflict in the region, particularly since the rise of Boko Haram in 2009.¹⁴⁰ The number of fatalities from conflict follows a similar pattern. Fatalities began to increase since 2009, and peaked around 2014 and 2015, at around 1,000 per year, before plateauing from 2016 onward (Figure 1.17).

The decade-long Boko Haram insurgency, which first rose in Northeastern Nigeria, has taken a devastating humanitarian toll in the Lake Chad region.

The region has 2.7 million internally displaced people, 257,000 refugees, and 5.3 million people who are facing severe food insecurity as of 16 September 2020.¹⁴¹ While other conflicts exist in the area¹⁴², the Boko Haram insurgency has been among the chief drivers for a record level of forced displacement in Nigeria and the Lake Chad Basin.¹⁴³ Assuming that displaced people do not return to their places of origin, the accumulated cost of displacement between 2013 and 2022 would be around N465 billion (US\$2.3 billion), even if further displacement were to be stopped. According to the Food and Agriculture Organization of the United Nations, nearly 50 percent of the population in the Diffa region in Niger is in need of humanitarian assistance, and nearly 20 percent are facing issues of food security.¹⁴⁴ In the case of Nigeria, per the same report, nearly 70 percent of the population living in areas near the lake is in need of humanitarian assistance, with 43 percent facing issues of food insecurity.

The Boko Haram conflict has also eroded the social fabric of the Lake Chad region.

The negative impact of the violent conflict on women and youth tends to be disproportionate on these groups’ higher existing

138 Vivekananda et al. (2019), p.10.

139 A lack of state presence in the region and elite capture have been associated with the rise of the insurgency: “The group itself is an effect and not a cause; it is a symptom of decades of failed government and elite delinquency finally ripening into social chaos.” (Felter 2018; Mahmood and Ani 2018).

140 The results presented in this section come from Fisker (2021) “Conflict and Climate in the Lake Chad Region”, technical paper for this report.

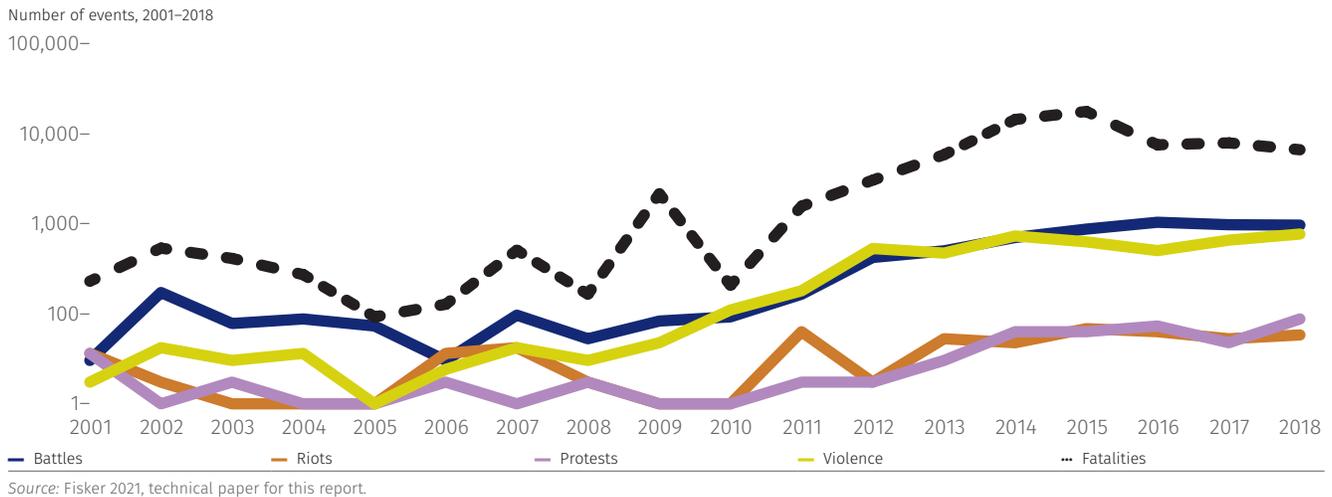
141 OCHA (2020).

142 Notably in Burkina Faso, Sudan, the Central African Republic and Mali.

143 UNHCR and World Bank (2016).

144 FAO (2017).

Figure 1.17: Conflict events and fatalities over time across the Lake Chad region



vulnerability.¹⁴⁵ The conflict has also reinforced distrust, whereby people are wary of anyone who may be former or active Boko Haram combatants. It has eroded social cohesion between groups following kidnappings and attacks against entire villages, as well as within villages, where the families of members of Boko Haram reside among other people. Heavy handed counter-insurgency measures have also contributed to the erosion of social cohesion and trust in the State, limiting future rebuilding efforts by governments.

Violent conflict and insecurity have also taken a significant toll on the regional economy. The level of violence in the region has intensified since 2009 when state security forces killed 800 of Boko Haram members, including its founder M. Yusuf.¹⁴⁶ At its peak (2015), the group seized a large swath of territories in Northeastern Nigeria, including major cities. The conflict has led to the disruption of economic activity and social networks,

as well as the destruction of private and public assets.¹⁴⁷ The Institute for Economics and Peace put the annual cost of violence in 2019 in Cameroon, Chad, Niger, and Nigeria at 6 percent, 7, percent, 8 percent, and 8 percent of GDP, respectively.¹⁴⁸ Between 2011 and 2015, the northeastern part of Nigeria—one of the most affected regions—suffered an estimated accumulated output loss of N1.66 trillion (US\$8.3 billion).¹⁴⁹ In 2015 alone, close to 800,000 individuals in the same subregion lost their income as a consequence of the forced displacement caused by Boko Haram.¹⁵⁰ This resulted in estimated losses of about N90 billion (US\$250 million).

The rise of Boko Haram has had significant negative spill-over effects undermining the economies of neighboring countries. The reduction in nighttime light could be as high as 20 percent in areas within 200 km from the epicenter of the conflict. It was not until 2014 that Boko Haram expanded more formally

145 For example, higher exposure to the risk of violent extremism and criminal activity in the context of high youth unemployment; or increased risk of gender-based violence.

146 Kimenyi et al. (2014).

147 Vivekananda et al. (2019).

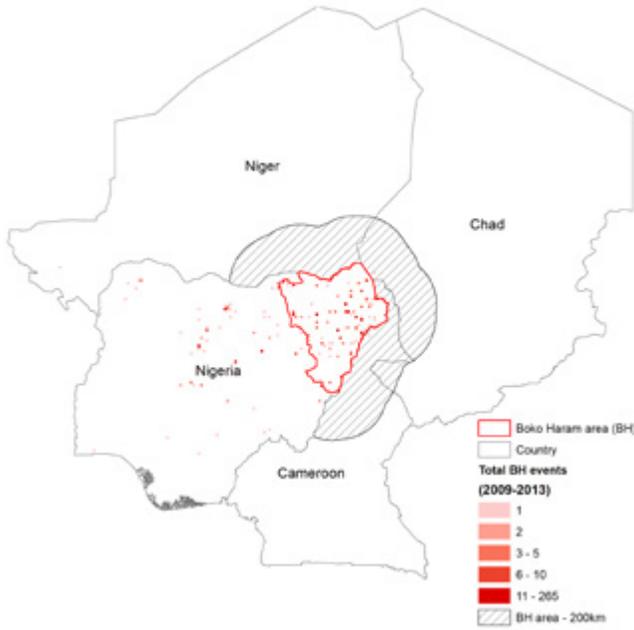
148 Estimates include direct and indirect costs of violence. Direct costs of violence are those costs to the victim, the perpetrator, and the government (e.g., military and medical expenditure and cost of policing). Indirect costs of violence are those that accrue after a violent event takes place, and include indirect economic losses, physical and psychological trauma to the victim, and loss of productivity. Estimates exclude spillover effects from conflict and violence, cost of crime to business, judicial system expenditure, domestic violence, and out-of-pocket spending on safety and security by households. Estimates are conservative and should be taken with caution given these exclusions. Methodology includes 19 variables across three domains: 1) Violence Containment; 2) Armed Conflict; 3) Interpersonal and Self-Inflicted Violence. IEP (2020).

149 See World Bank (2015b). Within the region, Borno State suffered from the largest loss in output, which fell by N708.18 billion (US\$3.54 billion).

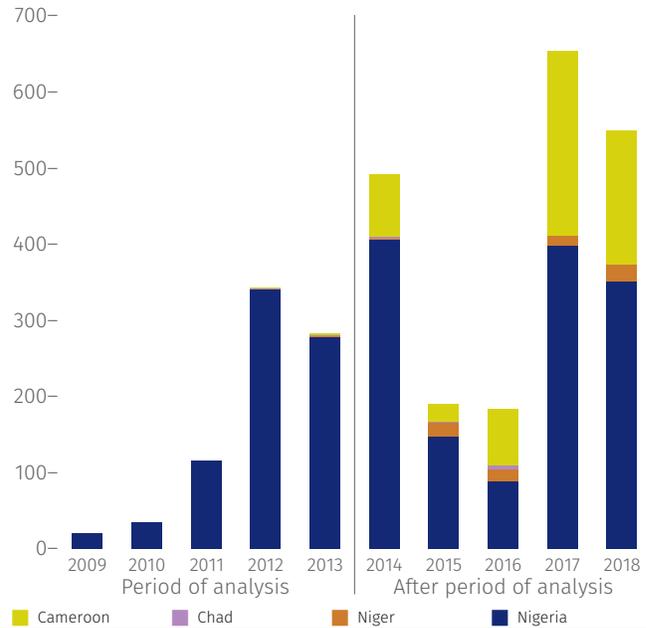
150 Pardo and Rossiasco (2016).

Map 1.16: Boko Haram Conflict in the Lake Chad region

a. Boko Haram Area and the Three Countries of Study



b. Number of Boko Haram Events, 2009–2018

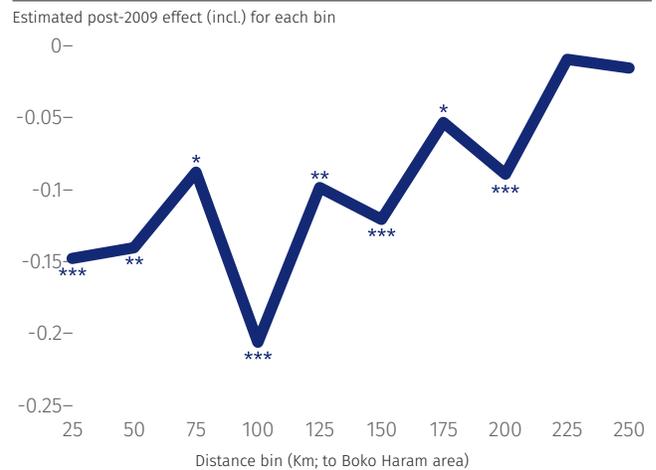


Source: Jedwab, Blankespoor, et al. 2021, technical paper for this report.

its terrorist activities outside Nigeria and into the territory of Cameroon, Chad, and Niger (Map 1.16, Panel B). Yet between 2009 and 2013—years for which temporarily comparable data on nighttime light are available—proximity to the Boko Haram conflict was already strongly associated with relative declines in local economic activities in Cameroon, Chad, and Niger. The analysis indicates that there is a significant effect of Boko Haram in urban areas within a range between 25 and 200 km from the insurgency’s activities. The average effect within 50 km suggests that the rise of Boko Haram reduces nighttime light luminosity by 15 percent. The effects for 50–100 km, 100–150 km, and 150–200 km are -15, -11 and -7 percent, respectively. Within the 200 km range, the effect suggests an average decrease of -12 percent (Figure 1.18). These negative spillover effects persisted and became even larger post-2013, reaching -35 percent by 2015 and -50 percent by 2018.

The negative spillover effects of Boko Haram activities are particularly significant in urban areas initially less developed and less connected to other markets. The opposite is true for more connected towns. Negative

Figure 1.18: Boko Haram effects by distance to the Boko Haram area post-2009 (Incl.)



Source: Jedwab, Blankespoor, et al. 2021, technical paper for this report. Note: The figure shows the post-2009 Boko Haram effect for each distance (to the Boko Haram area). Bin 25 corresponds to 0–25 kilometers; bin 50 corresponds to 25–50 kilometers, and so on. * $p < .10$ ** $p < .05$ *** $p < .01$

effects were not seen in urban areas that initially had relatively more robust economies (as measured in nighttime light intensity) or that had better access to other major markets. The fact that those areas were more resilient and less affected by the Boko Haram conflict is

likely due to their more diversified economies and their ability to trade with markets other than those in Northern Nigeria, which became inaccessible with the conflict.

Conflict has significantly disrupted production in the primary sector in the Lake Chad region. In Cameroon, after Boko Haram extorted farmers in the lake area as a source of revenue, the army banned the production of millet and maize (including in certain nonborder areas), which led to a decline in the agricultural production of cereals and to displaced farmers.¹⁵¹ Estimates suggest that, crop yields in Northern Nigeria could have been down by 50 percent or more at the height of the conflict, compared with pre-Boko Haram times.¹⁵² In Chad, cereal production in 2016 was 11 percent lower than in the previous year; while in Cameroon it fell by 25 percent in the Far North Region.¹⁵³ The World Food Programme reports that the insurgency likely contributed to the reduction in the production of sorghum and millet in Adamawa, Borno, and Yobe states in Nigeria by forcing farmers to leave.¹⁵⁴ Fishing activities constitute an important source of employment and income in the region with an estimated value of US\$54 million to US\$220 million.¹⁵⁵ These activities have been disrupted by the insurgency looking for a source of revenue, as well as by the embargo from the Nigerian armed forces to stop the insurgents.¹⁵⁶ In the Diffa Region in Niger, the revenue of fishers selling smoked and dried fish fell from US\$1,515 yearly before the crisis to US\$420, that is, a

decline of 72 percent.¹⁵⁷ The loss of mobility required to reach markets has also made for sizable trade losses.¹⁵⁸

Many markets in the Lake Chad region have closed due to security concerns. The ongoing conflict poses significant challenges to economic activities including through the closing of markets. Map 1.17, below, provides a visual description of the number of markets in the region that have remained either closed or been operating at a low capacity.¹⁵⁹ Many markets in Northern Nigeria where most of the Boko Haram attacks took place, were not operating between 2014 and 2016. This was partly due to the Nigerian government's mandate for some markets to close given that these were frequent targets of Boko Haram attacks. Between 2017 and 2020, several markets on the fringe operated with a slightly below or normal status. However, markets in close proximity to Lake Chad were well below or not operating at all. More recently, in 2020, markets in Chad near the border with Cameroon and Nigeria were not operating.

Crossborder livestock trade has declined as a result of the insurgency. Conflict has affected production and trade directly, as well as indirectly, through the counter-insurgency measures that restrict movement and put bans on farming and trade.¹⁶⁰ Transit flows of livestock seem to be declining. The transit of cattle to Nigeria from Chad and Cameroon decreased by 39 percent between 2015 and 2016–2017, as shown by customs data from the Yagoua livestock crossing point.¹⁶¹ The deteriorating

151 World Bank (2018).

152 Macaulay (2014).

153 FAO (2017).

154 WFP (2016a, 2016b).

155 FAO (2017).

156 FAO (2017).

157 Oxfam (2017).

158 An anecdotal, yet common example of market and petty trade disruption refers to the Baga fish trade, with an estimate value of US\$19 million in annual sales in 2001. Given its profitability and strategic location as a border town on Lake Chad, Boko Haram insurgents overrun the fishing town twice, taking overfishing activities. The securitization response to Boko Haram included the implementation of administrative and security barriers to prevent the insurgents from benefitting from the large revenue stream. Fishing trade fell to a fraction of its previous levels. The security-related road closures also meant that those allowed to fish were not able to transport their fish to markets without military escort. The price of transporting fish increased from approximately N700 precrisis to around N2,000–N2,500 (UNDP 2020).

159 These results are taken from Blankespoor (2021), technical paper for this report.

160 UNDP and OCHA (2016).

161 World Bank (2018).

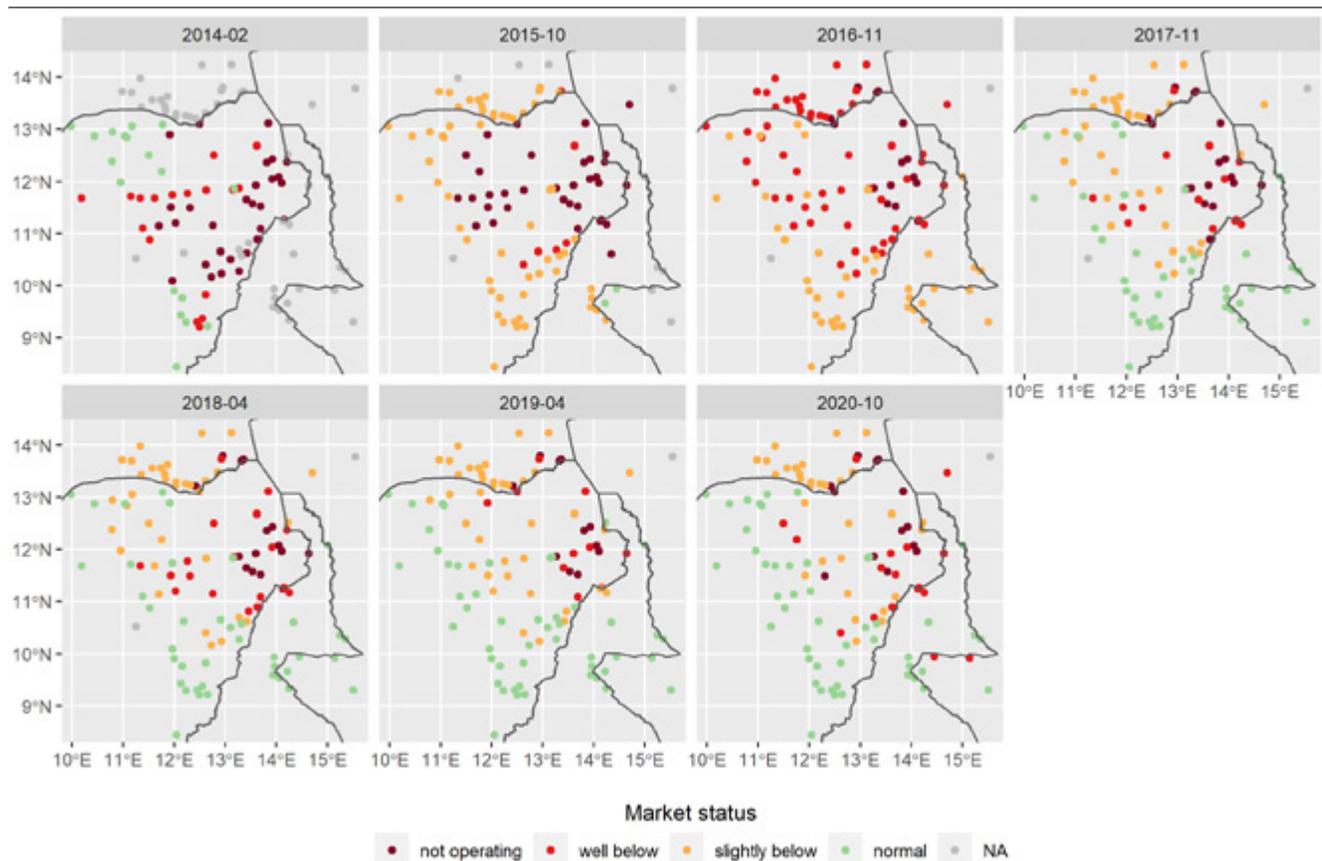
impact that the conflict has had on Chad's livestock exports to Nigeria is even more poignant considering that these exports are the country's second source of foreign revenue after oil.¹⁶² In Cameroon, estimates suggest that Boko Haram has stolen US\$6 million worth of cattle, sheep, and goats since 2013.¹⁶³ Market infrastructure has also been subject to physical damage. For example, in Damaturu in Yobe, Nigeria, over 650 shops have been reported to have been damaged.¹⁶⁴

Border crossings have been significantly reduced due to the heightened insecurity situations surrounding the region. Farmers in Cameroon who previously exported

crops to markets in Northern Nigeria have had to find alternative destinations for exports within their own country. Restricted access to key strategic trade centers in Northern Nigeria (for instance, Baga in Nigeria) have posed a significant loss for people in the region whose livelihoods depended critically on crossborder trade (Map 1.18).¹⁶⁵

Insecurity and restrictions on trade are also affecting prices, exerting upward pressure on food prices while depressing the price of tradeable such as livestock. Security measures, such as the banning of large vessels in Lake Chad by the Chadian government led to an

Map 1.17: The evolution of market status in the Lake Chad region, 2014–20



Sources: Blankespoor 2021, technical paper for this report; data of FEWS NET (Famine Early Warning Systems Network) (dashboard), FEWS Net, Washington, DC, <https://fews.net/>; Van Den Hoek 2017.
 Note: This panel set of maps shows trends in market status in and near Nigeria's North East, with a selection for each year from 2014 to 2020 during the same month of the publication of the report.

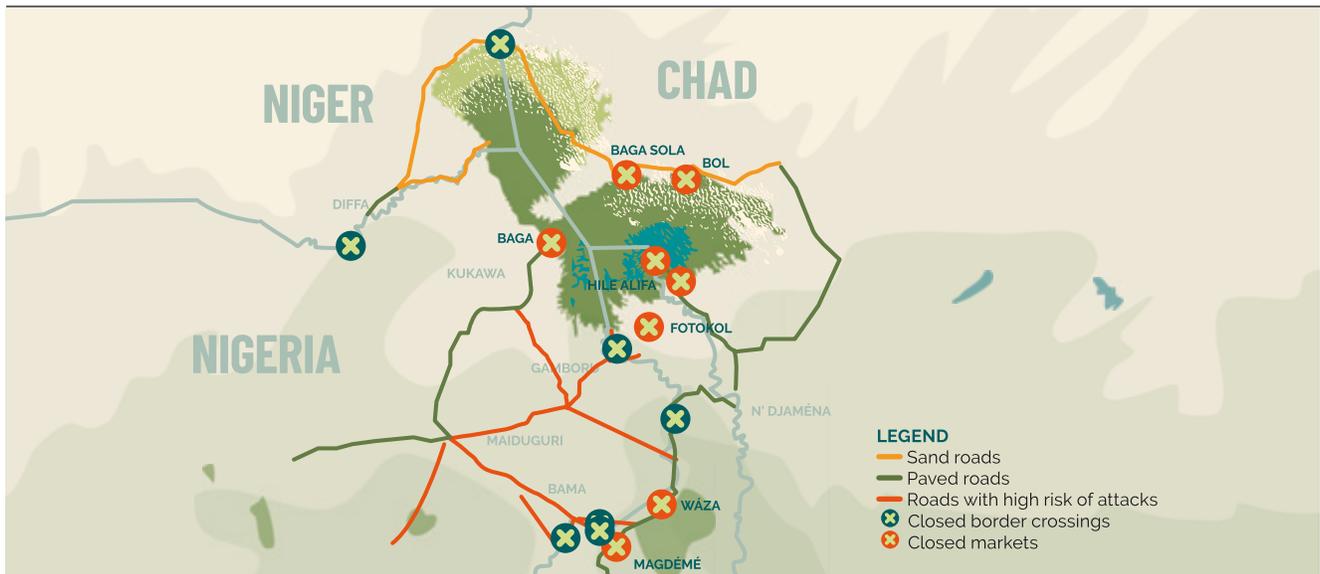
162 World Bank (2015a).

163 World Bank (2018).

164 Mercy Corps et al. (2017).

165 Vivekananda et al. (2019).

Map 1.18: Restrictions on crossborder movement and trade



Source: Vivekananda et al. 2019.

Note: The map shows a selection of restrictions for illustrative purposes rather than a comprehensive assessment. The selection is based on field research. The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by Adelphi or any of the funding parties.

automatic increase in the price of transport and goods. According to residents of the city of Bol in Chad, the price of basic goods increased by 30 percent since the ban on vessels came into force.¹⁶⁶ Data from the IMF show a surge in food prices and inflation in Chad, associated with lower agricultural production and security disruptions to the crossborder trade flows with Cameroon and Nigeria.¹⁶⁷ Prices in the northeastern part of Nigeria rose by 5.4 percent annually during 2011–15, while prices for food items rose by 7.5 percent annually.¹⁶⁸ Staple food prices in Niger are estimated to have risen steeply in the affected areas because of insecurity and the increased cost of transport.¹⁶⁹ At the same time, the inability to trade across borders is putting downward pressure on previously traded goods. The prices of livestock in Chad and Cameroon have dropped by 30 to 50 percent, given the countries' inability to export to Nigeria.¹⁷⁰

Boko Haram also plays an active role in smuggling in the region. Like other terrorist groups in the Sahel, Boko Haram works in connection with local criminal groups to control smuggling routes around the Lake Chad Basin. The insurgency provides young people with motorcycles, expecting them to monitor the positions of the defense and security forces (DSFs), allowing Boko Haram to plan attacks or change the routing of contraband transfers as needed. The collaboration tends to be more transactional than ideological, and the proportion of recruited youth is small.¹⁷¹ Nonetheless, for many youths in the Lake Chad region that lack economic opportunities, Boko Haram offers potential material and social advancement.¹⁷²

166 Cantens and Raballand (2017).

167 IMF (2016).

168 World Bank (2015b).

169 WFP (2016a, 2016b).

170 FAO (2017).

171 Lierl (2020).

172 Gaye (2018).

1.6 Policy Options

The analyses collated in this regional economic memorandum present a comprehensive diagnostic of the Lake Chad region, taking as a basis the feedback cycle between suboptimal territorial development, on one side, and FCV, on the other. The memorandum shows that over the last decades, the Lake Chad region has displayed little progress in social and economic development, with areas around the lake trailing behind the rest of the basin countries in terms of poverty reduction, human capital indicators, and economic growth. Limited access to basic services as well as to markets, infrastructure, and economic opportunities—particularly for youth, women and vulnerable groups—has rendered people unable to accumulate and use assets productively. At the same time, the region has been stricken by violent conflict and harsh climatic variations. This intersection is at the heart of this memorandum, which poses that the lag in territorial development is as much an outcome as a driver of FCV. Specifically, the analysis shows how low economic density and high distance and division—the ‘3Ds’—interact with and potentiate conflict and climate change—the ‘2Cs’—in the region, with negative impacts on development outcomes, in a self-reinforcing cycle. Breaking free from this cycle toward an inclusive and stable growth path requires promoting territorial development as well as reducing systemic risks, strengthening governance, and improving service delivery (See Figure 1.1 in Section 1.2).

Longstanding challenges to territorial development partly explain the Lake Chad region’s enduring poverty and sluggish economic growth. The region is characterized by low economic density and the absence of agglomeration economies, where urban areas are growing faster, with widening spatial gaps, and a lack of regional convergence. Connectivity gaps in the region are severe, particularly in rural areas, which limit people’s access to markets and higher-quality jobs. The variability in the water level of Lake Chad—whose surface decreased significantly between the 1960s and mid-1990s but has

started recovering since—had a permanent impact on local population growth, forcing people to migrate to urban areas. Both urban and rural settings, however, often lack access to basic services, infrastructure, and income-generating opportunities, particularly for women, youth, displaced people, and other vulnerable groups. The historically strong crossborder trade in the Lake Chad region was disrupted by the Boko Haram insurgency, which has become a source of social division in the region. The combination of low economic density, and high economic distance and division has contributed to prevent the region from realizing its potential as a diverse and vibrant agricultural and commerce hub, strategically placed within West-Central Africa, and to lay down foundations toward its structural transformation.

Violent conflict and climatic change are aggravating the region’s territorial development challenges. The findings illustrate the interlocking links between climate change and economic progress and stability: from the negative effect of the variability in the level of Lake Chad on population growth and urbanization, to the more recent variations in rainfall, vegetation and droughts and their impact on driving violent conflict and regional instability. Areas near the lake have experienced a higher share of drought than other parts of the basin countries, putting livelihoods and food security at risk. Droughts and human activity appear to be contributing to the scarcity of natural resources, which in turn, is a trigger of conflict, notably among pastoralists and farmers. There are signs of a climate-conflict trap, suggested by the association between climate anomalies—such as rising temperature, and erratic rainfall—and violent conflict in the region. The Boko Haram conflict has affected agricultural production, limited mobility and hampered crossborder trade in the basin. In addition, the conflict has aggravated social exclusion, curtailing access to services and income-generating opportunities, and driven the forced displacement of people. The economic impacts are not limited to the areas directly impacted but have

spilled over to neighboring regions. The memorandum shows that less well-connected and developed urban areas are more affected by the conflict. This underlines the self-reinforcing link between economic geography challenges, conflict and suboptimal development outcomes. Policies with the potential to improve territorial development and reduce conflict and the impact of climate variations can help break the vicious loop that is making the region diverge from its long-term potential.

In this context, there are several policy implications that this memorandum offers. First, as an overarching matter, it is urgent to address insecurity and conflict and restore the rule of law in the Lake Chad region. Notwithstanding progress, violent conflict and insecurity continue to undermine the stability for the inhabitants of the region, and impede advancement in other development areas. Concerted and bold efforts are needed to secure peace as a first step to inclusive and sustainable growth.

A second implication of the analysis is that for the Lake Chad region to escape its vicious cycle of weak territorial development and fragility, actions on several fronts will be required. Looking for a single action or policy to act as an engine of security and development is insufficient. Addressing the challenges emerging from territorial development and leaving aside those related to FCV would risk maintaining the status quo. This is not to say that a single policy implemented in isolation will not have a positive development impact. Yet, when the objective is to dramatically alter the development dynamics in the Lake Chad region, a holistic and coordinated effort along different fronts has the most potential. In this context, a multisectoral approach for policy implementation, that uses complementary interventions, is needed to address the interaction between climate change, violence, and laggardness. For example, investments in local public goods and services can

complement connective infrastructure. Improvements in transfer systems and local capacity can help strengthen the provision of local infrastructure and services. Easing the movement of goods and labor by reducing trade and information barriers can help facilitate trade. By building social cohesion, increased citizen participation can help restore government presence. And, coordinated resource management, information and technology transfer can help reduce divisions.

A third implication is that the needed interventions must generate a ‘big push’, strong enough to alter the existing dynamics in the region. Marginal interventions are unlikely to break or revert the self-reinforcing cycle that has kept the Lake Chad region in a suboptimal equilibrium. It is not that measures that go in the right direction will not have a positive impact on development outcomes, but rather, that these single interventions would be limited in what they can achieve given the complexity of the challenges involved.¹⁷³

Fourth, it is important to identify entry points, or policy levers, that can help break or revert the cycle of weak territorial development and climate change and conflict. Breaking this cycle will require a concentrated focus on improved natural resource management and strengthened governance to reduce the high social and economic costs imposed by climate change and conflict. Interventions aimed at mitigating the negative effects of climatic risks can reduce the stress over the primary sector and other economic activities, but also reduce potential conflicts between pastoralists and farmers over diminishing land and water resources. These policies, coupled with interventions aimed at improving governance and service delivery in the region, can further reduce conflict and fragility to enhance economic prospects and improve the credibility and legitimacy of governments in the region. The poor stand to gain the most from a reduction in conflict since they

¹⁷³ This is also well anchored in the World Bank's Crisis Response to COVID-19 and Climate Change, which, as discussed in the Development Committee Paper, lays out a broad framework for supporting green, resilient, and inclusive development (GRID) in IDA and IBRD countries. Integrated, longer-horizon GRID strategies are needed to repair the structural damage caused by COVID-19 and accelerate climate change mitigation and adaptation efforts while restoring momentum on poverty reduction and shared prosperity.

are often the victims. Less conflict implies reductions in production costs, decreasing spending associated with protection and elevated transportation costs. A reduction in violence would also create stronger value chains, potentially contributing to an increase in trade and open space for other areas of economic activity to grow. It would also reduce out-migration from the Lake Chad region and incentivize migrants and displaced people to return and invest. These policies can lead to an increase in productivity for farmers, herders, fisherfolk, and micro and small enterprises, leading to overall territorial development.

The policy discussion, next, is organized around four crosscutting policy areas: infrastructure, trade, governance, and natural resource management. Policies and programs across these four dimensions, which are grounded in the analytical framework¹⁷⁴, would help strengthen territorial development and reduce FCV, thus helping the region to break free from its current low-growth and high-poverty trap. First, investing in infrastructure can help close connectivity gaps in the Lake Chad region, leading to higher productivity and better-quality jobs, particularly in rural areas. Second, enhanced trade and regional integration are associated with stronger agricultural value chains, higher incomes, improved food security, and greater stability. Third, enhancing governance at the local, national, and regional levels is crucial to strengthen the rule of law which is needed to mitigate the devastating effects of violent conflict on lives and livelihoods and to ensure the delivery of quality services (e.g., access to schools, health facilities, electricity, safe water/sanitation) that would promote social inclusion and reduce divisions. Finally, improved natural resource management, including more effective land and water management practices suited to local agroecological conditions, would help mitigate the negative impacts of weather shocks, natural hazards, and climate change on productivity and livelihoods.

The level at which policies are designed and implemented matters, as well as the understanding of the institutional function they are serving. The implementation of the following policy options would benefit from taking into consideration whether they are to be designed and implemented at the regional, national, subnational, or community levels. Actions with potential to enhance security, trade, and natural resource management (land, water, climate change) require regional coordination and cooperation. On other hand, while investments in human capital can have positive spillovers onto neighboring regions, improving service delivery and social protection mainly requires robust policies at the national and local levels (that can also help strengthen each country's social contract). Considering the different agents and tractions at play, including at the subnational level, are also key to define whether policies would be better implemented through a top-down or bottom-up approach. It is also useful to consider the three core functions of institutions—and the challenges they address—that can ensure that rules and resources yield the desired outcomes, notably: commitment, coordination and cooperation (Box 1.1). Under this lens, security could be viewed as a commitment problem, requiring the appropriate incentives whereby all parties stand to lose if they default on an agreed arrangement. Improved coordination between subnational governments—building on the region's crossborder ties—could help facilitate trade, potentially leading to a better equilibrium for all parties. The sustainable management of natural resources in Lake Chad and climate change mitigation, on the other hand, will likely require explicit cooperation, with checks and balances, between the four countries.

1.6.1 Connective Infrastructure

A strategy to promote economic agglomeration in cities in the Lake Chad region would need to consider establishing better links with rural areas. Density, in the form of economic agglomeration and/or urbanization,

¹⁷⁴ Which draws elements from the World Bank (2003, 2009, 2010, 2011, 2013b, 2017).

Box 1.1: Three institutional functions—commitment, coordination, and cooperation—to increase the effectiveness of public policies

In insecurity settings, commitment is key to reach credible agreements. Commitment is achieved by establishing institutional arrangements that provide sufficient incentives for all key groups to work within the rules. The commitment is credible because all parties stand to lose if anyone reneges on those arrangements.

Coordination can also enhance policy effectiveness for security, growth and equity. For investment and innovation, agents must believe that others will also invest. Institutions can help solve market failures by coordinating both the investment decisions and the expectations of participants.

Finally, policies to achieve equitable development require cooperation. Among others, cooperation problems are often seen in the provision of public goods or solving environmental concerns related to overexploitation of natural resources. In coordination problems, multiple equilibriums exist, and policy is a matter of helping make the jump to the optimal one. Solving cooperation problems, by contrast, typically requires credible rewards or penalties to prompt actions that lead to the jointly preferred outcome.

Enhancing policy effectiveness

Designing policies to improve security, growth, and equity also requires understanding the balance of power among different actors. In the presence of powerful actors who can block or undermine policies, optimal policies from a strict economic standpoint (first-best policies) may not be the optimal implementable policies (second-best but feasible). Adopting an implementable second-best design could therefore be more effective than choosing the seemingly first-best but less-feasible policy.

Power sharing and resource redistribution can reduce exclusion and the incentives to engage in violence. Just as exclusion may lead to violence, mechanisms that encourage power sharing—such as legislatures that guarantee the representation of all groups—can reduce the incentives to engage in the use of force by raising the benefits of security.

Controlling clientelism can help solve problems related to delivering on redistributive policies. In clientelistic settings, the provision of public spending and services is often used for political purposes, for example favoring certain groups, while more vulnerable groups are excluded from resources. Mechanisms that control clientelism can enhance equity and make commitment to long-term objectives credible.

Source: Adapted from the *World Development Report 2017: Governance and the Law* (World Bank 2017).

is associated with economies of scale in production and an efficient accumulation of labor and capital, and thus with their potential for economic growth. A large share of the rural population in the Lake Chad region, however, is disconnected from the main road networks, making it difficult for people to benefit from the agglomeration that larger cities offer. Better links with rural areas can help low-density areas build up their economic densities

or at least increase their proximity to urban areas. Firms located closer to each other can reduce transaction costs and facilitate the exchange of knowledge to improve productivity, with a higher concentration of jobs. Policy interventions that improve connectivity between rural and urban areas in the Lake Chad region can, in this way, promote the growth of cities and reduce marginalization. Agglomeration in cities would also facilitate public service

delivery, presenting possible savings in water, sanitation, electricity, and road infrastructure, as well as making it easier to monitor violence and insecurity, all of which are needed to spur economic transformation to boost inclusive growth in the Lake Chad region.

Investing in road infrastructure and connectivity is a priority for reducing economic and social distance and division. Economic and physical distance hinder the flow of capital, labor, and goods and services. Improving connectivity, both within the Lake Chad region as well as between the region and other areas of the respective countries, would improve welfare through more income-generating opportunities and better—and more equitable—service delivery (which can, in turn, help minimize social divisions). The evidence presented in this report suggests that access to a paved road is associated with diversification away from agriculture in the Lake Chad region. This is because roads enhance access to markets and competition from other locations. Improvements in connectivity can have a catalytic impact for improved access to basic services. New investments need to take into account existing infrastructure to take advantage of complementarities, and importantly, making sure that existing roads are safe to travel.

A connectivity strategy for the region needs to consider revitalizing damaged infrastructure and markets and investing in maintenance and security. Insecurity and poor road infrastructure make up the main impediments to trade and transport in the Lake Chad region. Revitalizing infrastructure can include the rehabilitation of roads that provide safe alternative transport routes. Box 1.2 describes an alternative Eastern branch of the Douala-N'Djamena corridor, which has the potential to become a more secure route (Ngaoundéré-Koutéré-Moundou) for transport operators. To enable this corridor, parts of the road would need to be reconstructed and/or rehabilitated to ensure that the route can handle a substantial increase in traffic—and subsequently be well maintained and monitored for safety, for which it is important to enhance mechanisms for coordination between local, national, and regional agencies. One risk, however, is that once the conflict is mitigated, traffic may not return to the

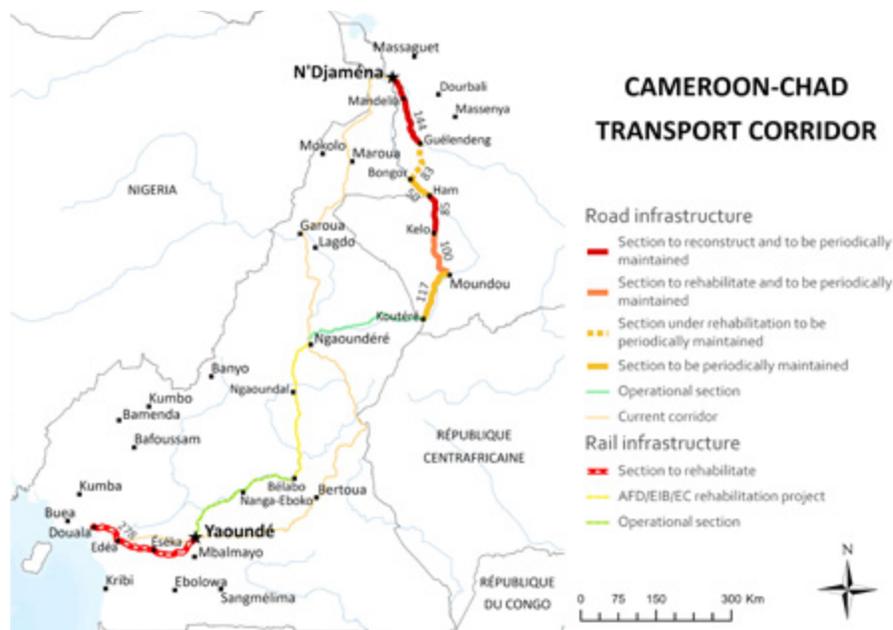
previous branch (Ngaoundéré-Garaoua-Maroua). Cost-benefit analysis and risk assessments can complement the resources and technical expertise necessary to reconstruct damaged infrastructure and markets instrumental for re-launching regional trade.

Investing in digital infrastructure and improving access to electricity would significantly reduce distance and division. As discussed in the report, the Lake Chad region lags in terms of digital infrastructure, access to digital technologies, and access to electricity. Access to electricity, cell phone coverage and broadband internet infrastructure are drivers of economic growth, with the potential of higher wages due to the lower costs faced by workers and firms, increased earnings of firms and household enterprises, higher consumer surplus derived from lower prices, and higher quality of services. Unlocking private capital and competition to fuel expansion in digital and electricity connectivity, particularly in rural areas, hinges on governments building frameworks that promote private sector participation. For instance, public-private partnerships can help engage nonpublic actors to assume risks and increase the efficiency of infrastructure investments. For digital and electricity services, where cost recovery is possible, it is important to ensure cost-reflective tariffs across the region, and at the same time, leverage the regulatory capacity of national governments (e.g., through competition authorities) to ensure market contestability and improved service delivery. This is to say that investments in digital and electricity connectivity need to be accompanied by investments in institutional capacity.

Policies that support urbanization and agglomeration need to take into account associated risks and include mitigation measures. By increasing competition, urbanization and agglomeration could lead to aggravated social and communal divisions or entrenching patterns of exclusion in the short term. In Maiduguri, for example, the influx of refugees may have contributed to fuel segregation and communal tensions. Interventions that support urbanization and agglomeration could also be perceived as favoring ‘settled’ farming over nomadic pastoralism. The opportunities and risks of efforts to

Box 1.2: Alternative routing of the Douala-N'Djamena corridor

Almost 80 percent of Chad's imports enter the country through the Douala-N'Djamena corridor. The deteriorating security situation and attacks by Boko Haram on the Northern segment of the corridor are a serious concern for transport operators, who have explored the use of alternative transport routes to N'Djamena. In particular, a passage that avoids the Far North of Cameroon and runs on Chadian territory has gained interest and traffic. Instead of traversing from Ngaoundéré via Garoua and Maroua to N'Djamena, the alternative route would run from Ngaoundéré East to Koutéré and then continue North to Moundou and N'Djamena (see figure). In 2015 alone approximately 500,000 tons of goods passed through this corridor compared with 40,000 tons through the previous corridor.^a Parts of the road still need to be reconstructed or rehabilitated to make this alternative branch capable of handling a substantial increase in traffic, but corresponding preparations and works are in progress.



Source: World Bank elaboration using ARCGIS Pro.

The new Eastern branch of the Douala-N'Djamena corridor would provide transporters with an alternative, more secure route to ship their goods to N'Djamena. This would help mitigate against the risk of Chad being cut off from international markets by the Boko Haram attacks in the Far North of Cameroon. On the other hand, the re-routing would drain traffic from the Ngaoundéré-Garaoua-Maroua branch, potentially depriving the population along the corridor of business opportunities. And, there is significant risk of a hysteresis effect. Once the risk of Boko Haram is mitigated and the Far North of Cameroon is safe again, it is unclear that all previous traffic would return to the Ngaoundéré-Garaoua-Maroua branch. The long-term effects of the emergency development of the Ngaoundéré-Koutéré-Moundou branch thus need to be assessed and mitigated to prevent the risk of further economic depression and isolation in the region.

Source: Walkenhorst 2021, technical paper for this report.

concentrate higher economic density of labor and capital may play out differently across time, with the benefits of agglomeration being realized in the longer term.

1.6.2 Trade Facilitation

The effectiveness and efficiency of economic and trade measures intended to counter Boko Haram must be regularly assessed, including at the regional level, as these measures often affect the livelihoods of export producers and traders. This includes considering ways to allow gradual and safe access to parts of Lake Chad to renew fishing and fish trading, and opening borders. Another important step is to re-evaluate the current restrictions on movement and access to farmland, balancing the need to contain and suppress Boko Haram with the desirability to restart the local economy. Leveraging spatial data would help in this regard. Crossborder agricultural trade can be a source of food security and resilience, where weather-and insecurity-patterns are not neatly confined to national borders, and often the closest source of food supply is across a border. Given the urgency to boost food security and restore commercial ties in the wake of COVID-19, it would be important that initiatives aimed at boosting trade build on the strong informal crossborder trade practices. Historic ties binding the region are a potential strength. Elements in the policy levers of trade could leverage the resilience of trade networks in the region—family relationships, connected border communities, and local alliances—and be designed with a view to better leverage this social capital (the same could also be applied in terms of natural resource management). In addition, an aim to manage the crisis, minimizing the potential for additional harm, can benefit from considering short, medium, and longer-term priorities.

Functional roads and markets are instrumental to recover regional trade and contribute to close divisions. There is a strong case to focus resources and technical expertise on reconstructing damaged infrastructure and

markets, especially near or at borders that are instrumental for re-launching regional trade in the medium term. While complex to implement, another aspect that could bear benefits is contributing to ensure that local security forces enable roads that are passable to work properly as a route for the transport of goods, without excessive police roadblocks or red tape. Improved customs operations is key to revitalize long-distance trade corridors. In the immediate term, however, borders are closed, transport routes have been abandoned, and several markets have been disrupted or closed. In this context, it is important to provide support for communities that have been deprived of their traditional export production so that they can support infrastructure rehabilitation efforts.

A key step to recover regional trade is facilitating crossborder trade between the Economic Community of West African States (ECOWAS) and Central African Economic and Monetary Community (CEMAC) members, taking advantage of the opportunities offered in implementing the newly signed the Africa Continental Free Trade Area (AfCFTA). The four Lake Chad countries are members of different regional trading blocs: Cameroon and Chad are members of CEMAC and CEEAC (Economic Community of Central African States), while Niger and Nigeria are part of ECOWAS. This means that trade is not duty-free between the two blocs and trade regulations are not harmonized. For example, the import tariffs applied by Cameroon are generally higher than those charged on imports into Niger and Nigeria. Differences in tariff and taxes create incentives for trade diversion and smuggling. The recent signing of the AfCFTA agreement and its implementation would eliminate tariffs within the region and offer the opportunity to align other policies. Gains from trade facilitation, in particular, the reduction of nontariff barriers under the AfCFTA are expected to be large.¹⁷⁵ Trade facilitation and integration measures in the Lake Chad region could involve, among others, the visa-free movement of persons as well as the exemption for agricultural and livestock products and handicrafts

¹⁷⁵ See World Bank (2020a).

of the requirement to be accompanied by a certificate of origin.¹⁷⁶ Complementary trade facilitation measures would also enhance the benefits of transport corridors. For example, reduced border frictions (smaller transport waiting times) would have positive economic effects, as shown in this report, including positive spillover effects on nearby countries.

Investing in economic infrastructure to support the collection of data on economic activity and trade can provide policymakers with a better information base. More and better data on traded quantities in markets and the sources of supplies could be collected and monitored, as well as more comprehensive and consistent market price data than those currently available. Novel data gathering techniques (e.g., remote sensing, border surveys, cell phone data records) would help better understand the complexity of trade and smuggling in the Lake Chad region, and how these are evolving. Priorities in this regard include improving the collection of information along points of entry/exit and trade routes, for instance by attaching geospatial data (locations, roads) to customs declarations, intelligence reports, and fraud cases.

Having substantive input from borderland communities for economic development strategies, including trade, can help with the sustainability of efforts. Research suggests that strict border controls negatively affect borderland communities, increasing unemployment, crime, and outmigration.¹⁷⁷ Rather than relying solely on security institutions as the dominant state representatives in borderlands, border security practices can benefit from increased participatory local governance and state-sponsored people-to-people dialogue at the border.

1.6.3 Governance

Restoring a positive state presence in the Lake Chad region is paramount. Improving the delivery of basic public services is a foundational aspect of restoring state presence, not only because of the need for basic services but as a cornerstone to start rebuilding government legitimacy in the region. Improved accountability and transparency of state structures are also necessary to rebuild government legitimacy, which can help improve—and sustain—security in the area. Addressing the attrition of public institutions can provide a better foundation for peace than a focus on a rapid exit from asymmetric conflict. Strengthened institutions that can create incentives both to reach agreements and to enforce them can create the foundations for peace and stability.¹⁷⁸ Promoting inclusive decision-making processes at the local level can help increase the participation of citizens in the development of their communities, which can also increase legitimacy and the sustainability of efforts. In some cases, effective state presence may also imply striking a balance between governments' decentralization processes while strengthening local governments to ensure they have the sufficient capacity to carry out their functions.

Increasing the opportunity cost of engaging in violence and providing economic opportunities to younger populations is needed to mitigate conflict. Engagement in decision-making structures can contribute to reduce youth vulnerability and exclusion, while better economic opportunities can discourage engaging in violence by increasing the relative opportunity cost of fighting. This report shows that droughts and abnormally high temperatures correlate with higher incidence of conflict possibly by lowering the opportunity cost of fighting. It is therefore crucial to provide alternative sources of livelihoods to people living in areas struck by heatwaves and droughts. In some cases, encouraging migration to

176 These measures are already part of the ECOWAS Trade Liberalization Scheme and could possibly be applied at ECOWAS-CEMAC borders on a reciprocal basis.

177 Ayadi et al. (2014).

178 United Nations and World Bank (2018).

urban or more fertile areas could be applicable (where recipient areas, with basic service provision and income-generating opportunities in place, have the potential to absorb migrants).

Another key aspect to mitigate the violent conflict is to restore social cohesion and trust between citizens and the state, as well as between communities. The Boko Haram insurgency in the region has led to the disruption of social bonds, the decline of social capital and the erosion of the social contract. Growing distrust, fear and anger toward people of different ethnic, religious and political persuasion and geographical origin, as well as toward those suspected of any association with the insurgency are being reflected in everyday life—such as in the avoidance of previously used markets.¹⁷⁹ Social divisions are also frequent among displaced people, who face barriers to integrate into local communities. There is evidence of discrimination and limited access to services (education, health care, social assistance, and access to land and livelihoods) in the region, including in urban areas that have grown rapidly and unplanned as a result of this displacement.¹⁸⁰ In parallel to the disruption of social bonds, the population has also lost confidence in the government's capacity to take effective public action, further eroding the social contract.¹⁸¹ Both social divisions and loss of confidence in the government contribute to fuel the ongoing conflict.

Participatory and inclusive approaches can maximize the conditions to repair social divisions.¹⁸² Supporting joint social, planning, and development initiatives between displaced and host communities can help reduce stigma and mistrust. Locally specific projects—that take into account the circumstances of vulnerable groups—and conflict-sensitive programming help mitigate further violence. Well-known and trusted strategies to rebuild social capital include supporting and rebuilding local

institutions; fostering community-level reconciliation and the establishment of institutional mechanisms for conflict resolution, in addition to the disarmament, demobilization, de-radicalization and reintegration of ex-insurgents.

Investments in both local government capacity and community voice in the Lake Chad region hold great potential to improve the quality and inclusiveness of service delivery, as well as government legitimacy. Strengthening state authority and institutional capacity, with adequate financial and human resources, to enhance the scope and improving the quality of social service delivery at the local level is a key element of restoring the social contract.¹⁸³ Restoring state presence also implies responding to the root causes of the insurgency—such as through the provision of quality services in areas where there were no public services before—as well as taking advantage of new opportunities, such as formalizing the new markets provided by new population concentrations. Real and perceived state neglect and grievances related to the exclusion of certain regions or groups from services and opportunities can be important drivers of conflict and violence.¹⁸⁴ In such contexts, how investments and services are delivered matters just as much as what is delivered. A key aspect to the sustainable repair of social division in Lake Chad is ensuring equity in the provision of public infrastructure and services and employment opportunities by balancing social diversity. Addressing existing imbalances in access (*distance*) to services, markets and economic opportunities across different socio-economic and demographic groups (*division*) can have significant implications on employment, poverty and welfare. Community-driven development mechanisms can also be a useful step toward repairing service delivery in remote, conflict-affected regions where the state is absent and/or lacks capacity.

179 UNHCR and World Bank (2016).

180 UNHCR and World Bank (2016).

181 Magrin and Perouse de Montclos (2018).

182 UNHCR and World Bank (2016).

183 UNHCR and World Bank (2016).

184 United Nations and World Bank (2018).

Institutions and social relations (including between the government and the governed) need to be rebuilt alongside physical infrastructure, with the engagement of local communities. Greater engagement of citizens in planning, budgeting and service delivery can help promote accountability and transparency. Ensuring that historically marginalized groups are represented in discussions on local development decisions would help address existing divisions, instead of entrenching them. Local governments have a crucial role to play. Central governments can help create conditions for effective local governance, including through the transfer of responsibilities and *regular* financial resources to local governments, and through a more efficient distribution of roles between local government and government agencies.¹⁸⁵ The consolidation of oversight and check-and-balance mechanisms, at both central and local levels, can help reduce corruption and improve the quality of public services. More transparent and more legitimate local governments can also be more accountable for their budgets and activities.¹⁸⁶

Public investment in core infrastructure and basic public services can be an engine for inclusive growth. Evidence from this report shows that access to electricity in the Lake Chad region is lower than in the rest of the respective countries, and the gap is widening both for access to improved sanitation and electricity. The lack of quality infrastructure and basic public services makes the Lake Chad region less competitive and an unattractive destination for firm entry and job seekers. The low level of service provision is further compounded by the conflict, which has driven people away from the region. Investing in core services and infrastructure—including, but not limited to, roads, water and sanitation services, and digital technology—is critical to unleashing the agglomeration potential of the region.¹⁸⁷ Public investments can improve the rural and urban water supply and sanitation, as well

rural electrification, taking advantage of solar energy where possible.¹⁸⁸ Other priority activities include education adapted to mobile populations and health initiatives, such as local health stations; construction of regional hospitals, epidemics prevention, and family planning support.¹⁸⁹

Improved governance and transparency can contribute to garner local resources toward public investment. The decline in oil revenues in addition to the negative impact from the violent conflict and climate change have weakened resources in the region, already experiencing weak fiscal management. In addition to support from the international community, local resources can contribute to the sustainability of recovery efforts. Strengthened governance and the provision of services can improve government legitimacy, encouraging citizens to support local development through cofinancing and the joint management of local investments and the payment of local taxes.

Enhancing fiscal space can help support social protection efforts. Social protection is important to addressing the need of inhabitants living in poverty. In parallel to creating fiscal space to support social safety nets (see Box 1.3), priorities for social protection include establishing a fiscally sustainable social assistance system and leveraging existing partner-financed programs. This could be achieved through better channeling fiscal revenues; strengthening coordination and alignment across the regional, federal, state, and local levels (for example, by leveraging data collection efforts, including registry databases); building local capacity for program delivery; and developing a common delivery platform for programs implemented by different ministries and agencies and at different levels of government. Well-designed targeted safety net programs could address the specific vulnerabilities of excluded groups, such

185 Magrin and Perouse de Montclos (2018).

186 Magrin and Perouse de Montclos (2018).

187 World Bank (2003).

188 LCBC (2015).

189 LCBC (2015).

as adolescent girls out of school, youth, and newly poor affected by violent conflict and climate change. In the context of the Lake Chad region, improving the performance of social assistance programs would require specific design and implementation efforts to gather and use credible, up-to-date, and relevant information to deliver well-targeted benefits, as well as to link cash-transfer and youth employment programs with other programs for nutrition, education and life skills, and health services, including at the community level. Complementarity between health and education services and social protection can enhance the impact of interventions. For example, health care, education, and social protection services that are effectively combined can serve as a stepping stone for rapid and successful urbanization.¹⁹⁰

Subnational governments are responsible for delivering basic services; yet, they are highly dependent on fiscal transfers from the national governments to finance these services. Box 1.3 shows the case of Nigeria. At the national level, Nigeria, like the other three countries of the Lake Chad region, struggles to mobilize domestic revenues. As a result, there are limited resources to transfer to subnational governments. Moreover, because Nigeria depends on volatile oil revenues, fiscal transfers to local governments tend to be not only low but also unstable, to the detriment of basic services. Mobilizing domestic revenues and advancing fiscal decentralization, underpinned by enhanced public financial management, is thus a critical priority for national and subnational governments in the region.

Investing in data collection and analysis is a recommendation that cuts across all policy areas. This report highlights the value of data and analysis to inform policy making and development programming, especially disaggregated data that highlight differences across groups and territories and that help identify patterns of social marginalization and exclusion. The

challenges and opportunities of the Lake Chad region remain inadequately studied and are most often looked at through a national lens, whereas effective and durable solutions tend to be regional and spatial. Data collection and analysis are insufficiently harmonized and coordinated, and subnational data on key socioeconomic and governance aspects are often lacking. Backing existing regional initiatives that support better access and quality of development data, local research capacity, and regional policy dialogue would promote evidence-based policy making.

Given the shared and interlinked challenges and opportunities across boundaries in the region, coordinated approaches and regional bodies can enable the emergence of a common vision for the development and stability of Lake Chad. Shared strategies, with equitable cost-sharing, hold great potential to address the interlinked security, economic and climatic challenges in the lake basin. Under the supervision of the African Union (AU), two regional consortia have been tasked with counterinsurgency and regional development, and made mutually accountable. On the security side, the Multinational Joint Task Force was authorized by the African Union to combat Boko Haram in 2014, under the civilian oversight of the Lake Chad Basin Commission (LCBC) (see Box 1.3).¹⁹¹ On the development side, the LCBC was initially formed in 1964 to oversee and coordinate national decisions affecting the shared transboundary water resources—the lake, its tributaries and groundwaters. It was later tasked with security oversight, hence its supervision of the Multinational Joint Task Force today. Given the region's tense political economy and history of fractious interstate relations, translating the aims of these two regional institutions into reality is a work in progress. Coordinated and jointly executed action—for example, border cooperation—remains one of the main cornerstones for stabilization and economic recovery.

¹⁹⁰ World Bank (2009).

¹⁹¹ Eight member states are represented in the LCBC: Algeria, Cameroon, the Central African Republic, Chad, Libya, Niger, Nigeria, and Sudan. Parties commit to a shared use of the basin's natural resources.

Box 1.3: The importance of fiscal transfers for subnational governments in the Lake Chad region: the case of Nigeria

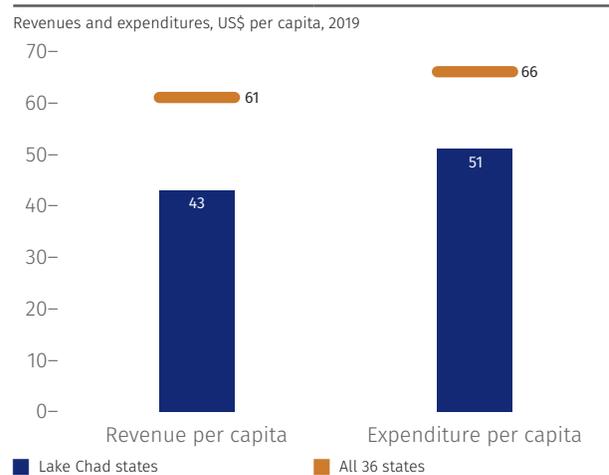
State governments in Nigeria are responsible for basic service delivery. Together with their respective local governments (774 in total), the 36 Nigerian state governments are responsible for basic education, as well as adult and vocational education, health services, agricultural development, and basic physical infrastructure (sanitation, roads, and other public facilities).

The majority of revenues received by the Nigerian state governments (about 70 percent in 2018–2019) come from federally collected oil and nonoil revenues, distributed based on a formula. These revenues originate from customs, corporate taxes, and value-added taxes. They are distributed based on a revenue-sharing formula across the three tiers of government (federal, state, and local). These ‘gross statutory allocations’ are often volatile due to the dependence on oil-revenues, which are sensitive to global price fluctuations. States can collect internally generated revenues, which include personal income, property, and road taxes, as well as other fees and levies. These internally generated revenues contribute, on average, about 30 percent of states’ government revenue envelope. States can also borrow, including externally, with a federal government guarantee.

Adamawa, Borno, and Yobe—the three Nigerian states in the Lake Chad region—have below-average total revenues per person, depending thus heavily on revenue transfers from the federal government. These three states collect less than half the national average in independently generated revenues per capita. As a result, they are more dependent on federal revenue transfers than the national average. Borno, for example, relies on federal transfers for more than 80 percent of its revenues. The total annual revenue per capita is equivalent to US\$34 in Borno, US\$43 in Adamawa, and US\$52 in Yobe. These figures are between 16–45 percent below the Nigerian state average of about US\$60. Consequently, Yobe, Adamawa, and Borno have below-average public spending per capita despite the high development needs and security issues in these states. A weighted average nondebt public spending per person across Nigerian state government (excluding local governments due to lack of data) is US\$66 per year (2019). In contrast, per capita spending in Adamawa (US\$49) and Borno (US\$40) is well below the national average. The budgetary state spending in Yobe, at US\$64 per person per year, comes just below the national average.

Insecurity in the Lake Chad states in Nigeria is potentially influencing the composition of state public spending. Yobe, Adamawa and Borno allocated relatively more budgetary resources to recurrent spending components. Although the three states allocated a relatively higher proportion of their scarce budget resources to education and health in 2021 than the average state in Nigeria, they also allocated below average resources for expenditures

Figure B1.3.1: Nigerian states in the Lake Chad region have lower revenues and expenditures per person than the average Nigeria state



Source: World Bank calculations based on data from Nigerian authorities.

Box 1.3 *continued*

in the economic affairs segment (which includes agriculture, transport, and other core physical development components), which may undermine their long term economic growth prospects.

All Lake Chad states are making efforts to improve their fiscal sustainability. Notably, they are participating in the Federal Government's States Fiscal Transparency, Accountability, and Sustainability Program for Results, which is supported by the World Bank. This program rewards (through grants) substantive improvements in states' fiscal and financial management, including revenue and debt management, procurement, and citizen engagement. In fact, Yobe is the top performer across all 36 participating states in Nigeria since the inception of the program, achieving the highest results. All three Lake Chad states also achieved the new COVID-responsive results introduced in 2020 to help marshal fiscal resources to the states amidst the pandemic.

1.6.4 Natural Resource Management

Strengthening the sustainability of food systems is a priority. Interventions at the regional level can help strengthen the capacity of food systems to ensure food security. Three areas of focus, identified by a World Bank and FAO report on West Africa, refer to strengthening the sustainability of the food system's productive base; promoting an enabling environment for intraregional value chain development and trade facilitation; and enhancing regional risk management architecture and farmer decision support tools.¹⁹² On this last element, risk management tools—such as improved information and crop and rainfall insurance—can help people mitigate risks.¹⁹³ This ability, in turn, can allow people, particularly the poor, to be more willing to take on risk in search of higher yields and productivity. At the same time, social protection programs and safety nets can help reduce target populations' vulnerability in hotspot areas. Notwithstanding the importance of these tools, the implementation of these interventions in the Lake Chad region needs to be evaluated in the context of limited fiscal space and considering the time dimension, as well as—in the case of safety net programs—their potential implications and interactions relative to the armed conflict.

Expanding support for producers—in the forms of credit, inputs, extension services as well as investment in infrastructure—is essential to the productivity and resilience of food production systems.¹⁹⁴ In addition, securing the access of vulnerable populations to land, pasture, and fishing resources (in an inclusive way, promoting coexistence with other producers in the area) can prevent conflict and enable intensification. At the same time, initiatives to support agricultural production may benefit from explicitly recognizing the coexistence of different—and, at times, competing production models—such as those of farmers and herders. Agriculture is not a homogeneous sector, and understanding the potential tensions between modes of production can shed light on a core issue of conflict dynamics.

Securing land rights in the Lake Chad region may help enhance productivity as well as stability in the region. The formalization of land rights has the potential to improve agricultural productivity by incentivizing farmers to make long term investments.¹⁹⁵ Formalizing land ownership may also help reduce friction and conflict between farmers, pastoralists and fishers vying for limited access to land and water resources in and around the lake basin. This can be particularly important in a context where increasingly erratic climate has introduced a greater

¹⁹² World Bank and FAO (2021).

¹⁹³ World Bank (2013b).

¹⁹⁴ LCBC (2015).

¹⁹⁵ World Bank and FAO (2021).

degree of uncertainty to the availability of such land and water resources.¹⁹⁶

There are substantial expected gains from context-specific natural resource management interventions that take into account the specific circumstances of a given population or territory. A key aspect of these interventions is taking into account the cases for which place-based policies—i.e. territorial development—are likely to have a positive outcome, and in which cases people-based policies—more focused on efforts in urban areas to better absorb migrants—can be a better alternative. In the case of the latter, coordinated efforts to strengthen services and employment opportunities in urban areas can help ensure that poverty is not merely being displaced from rural to urban areas. In the case of the former, efforts to support producers, including vulnerable groups, considering local tensions and dynamics can bring about sustainable productivity improvements, as mentioned above. Context-specific discussions are thus essential to inform effective natural resource management.

Investing in sustainable agricultural management through technological innovations can help increase output and harness existing natural resources. Technology and innovation can reduce climate uncertainty among farmers and enable better decision-making, increase yields and reduce waste.¹⁹⁷ The optimal use of natural resources driven by technology can be key in reducing environmental degradation and mitigating risks stemming from volatile temperature and water levels. The support from governments in the Lake Chad region to facilitate this transfer of technology, in tangent with the international community, can help enable vulnerable populations to benefit from access to technology. Efforts could include bringing together agricultural research centers and setting up an optimal

matching mechanism between farmers and agricultural inputs adapted to their climatic and social context.¹⁹⁸ Setting up a knowledge dissemination campaign in local languages can raise awareness among local producers of the potential climatic risks and novel agricultural inputs and techniques available.¹⁹⁹

Preventive rather than reactionary policies can more successfully mitigate risks stemming from climate change and build local adaptive capacity. Shifting from ex-post responses to proactive, ex-ante, sustained, and integrated risk management is no easy feat. Yet, it is well documented that the benefits of proactive actions far outweigh the cost of “risk inaction.” Facilitating an environment for coordinated action and risk-sharing in the region can enable this process while ensuring that vulnerable stakeholders are not overlooked. Knowledge sharing and dissemination can help reduce the uncertainties faced by people living near Lake Chad, for example, by setting up a regional early warning system to better cope with natural disasters, such as floods and droughts.²⁰⁰ Overreliance in reactionary policies discourages investments in adaptive capacity across poorer households, making them more vulnerable to future climate-related shocks, perpetuating the current conflict-poverty trap.

Water stress and climate vulnerability validate the continued engagement of the LCBC on shared water management, while enhanced participation may be needed. Development partners can invest strategically and ensure a higher standard of donor coordination and harmonization at the regional and basin level, particularly as climate finance increasingly comes into play (Box 1.4). Member states actively promote and seek funding for regional infrastructure for an interbasin transfer, yet lag on the more basic levels of regional cooperation. External

196 See more discussion on the linkage between land rights (or lack thereof) and conflict in the Lake Chad Basin: <https://climate-diplomacy.org/case-studies/local-conflicts-over-resources-around-lake-chad>.

197 World Bank (2019b).

198 LCBC (2020).

199 LCBC (2020).

200 LCBC (2020).

support needs to follow the logic of domestic incentives, and design aid so that it promotes—when possible—long-term development and conservation focusing on the southern tributaries of the lake. Examples from other regions suggest that technical cooperation can, in the long run, incentivize member states to take water cooperation more seriously.

Strengthening the administrative and institutional capacity of the LCBC could help the organization more effectively manage water resources and climate-response policies. An insufficient clarity of roles and competencies, as well as a lack of investment and interest by member states, emerge as some of the current institutional constraints faced by the commission and the Multinational Joint Task Force (see Box 1.4).²⁰¹ Enhancing the operational capacity of the LCBC could include regular meetings, data- and information-sharing, and sustainable financing. Establishing viable systems for information and data collection and exchange may pave the way for gradual buy-in and trust-building in the future. Reliable data and hydrological modeling are an urgent concern, especially as plans for major infrastructure works, including those for an interbasin transfer remain on the agenda. National statistical offices could facilitate the standardization of agricultural data collection and set up a readably available database that feeds into early warning forecasting models.

The Lake Chad region has vast development potential; unlocking this potential will foster the creation of greater opportunities for its citizens. The region has a young population, is rich in natural resources, and in the past has seen important trade flows. Yet, it is also a region facing long-term and pressing challenges, particularly a self-reinforcing vicious cycle between suboptimal territorial development and FCV. Throughout discussions with stakeholders in the region, there was broad consensus on the need to break the cycle. Doing so will require sustained implementation of a holistic agenda and thus broad societal consensus and a long-term political

commitment at the highest level. The priorities identified in this Regional Economic Memorandum seek to help guide policy for breaking this cycle and bridging the gap between potentials and actuals.

201 Assanvo, Abatan, and Sawadogo (2016); Galeazzi et al. (2017).

Box 1.4: Transboundary water management in Lake Chad

Transboundary water management may serve to consolidate regional interests and prevent resource-related tensions from turning violent. In the Lake Chad region, effective water management of the lake and its tributaries can help foster greater coordination among the four basin countries.

While the Lake Chad Basin Commission (LCBC) has thus far prevented nonconsensual action by a member state, such as upriver damming, it scores relatively low among other African transboundary water agreements. The efficacy score is based on the degree of transboundary cooperation, or water cooperation quotient, an indicator combining criteria, such as the existence of river basin agreements, a river basin authority, current and planned investment in water infrastructure, political commitment, economic cooperation, and so forth.^a As assessed by the Strategic Foresight Group (2017), Senegal, the Gambia, and the Niger river basins ranked highest, meeting 100 percent of the criteria, among 231 transboundary watercourses. In contrast, the LCBC scored 53 percent.

The LCBC was initially formed in 1964 to oversee and coordinate national decisions affecting the shared transboundary water resources, including the lake, its tributaries, and groundwaters. Eight member states are represented in the LCBC: Algeria, Cameroon, the Central African Republic, Chad, Libya, Niger, Nigeria, and Sudan. Parties commit to shared use of the basin's natural resources. The multidonor joint fund, the Sahel Alliance, has undertaken an economic recovery program covering conflict-affected regions of the Lake Chad Basin, though most of its investments are concentrated in the Western Sahel.

The Lake Chad Basin Authority's charter was developed in 2012 to foster the shared management and sustainable exploitation of Lake Chad. As with other progressive water agreements and regional charters, it has not yet entered into force. In 2015, faced with increasing and new forms of insecurity and the absence of a dedicated regional bloc, the LCBC's mandate increased to include oversight of regional security cooperation through the task force. Yet, in its transboundary water management capacity, LCBC's leverage over member state interests to deliver coordinated water management is limited.

The performance of LCBC is mixed not least because mechanisms and tools to monitor and control the use of water resources are not fully operational. This partly derives from the insufficient clarity of roles and competencies, but also from an apparent lack of political interest and investment among member states. The main players, including Nigeria, have invested some political capital in the organization, but tend to favor more politically visible interventions. For example, the massive proposed transnational inter-basin investment to transfer water from the Congo River Basin to Lake Chad is favored over structural interventions to address the environmental decline and agricultural transformation in the wider basin area, particularly around the southern tributaries of the lake. While technically feasible, the massive infrastructure project is estimated to have an extremely high cost. It has been criticized for potential adverse effects on the ecosystems of both basins as well as possible negative effects on the flow of the Congo basin. The World Bank, the United Nations Educational, Scientific, and Cultural Organization, and other major donors do not endorse the large-scale hydro infrastructure as a Lake Chad basin management solution. These entities have funded multiple studies and proposals for the collective management of the lake resources through the Lake Chad Development and Climate Resilience Action Plan, which funded €6 million worth of feasibility studies for the inter-basin water transfer proposal. UNESCO sponsored the International Lake Chad Conference in 2018 in which LCBC countries endorsed an Italian proposal, Transaqua, as their preferred option for the inter-basin water transfer project.^b

a. Strategic Foresight Group (2017).

b. See PAMACC (2018); Sayan, Nagabhatla, and Ekwuribe (2020).

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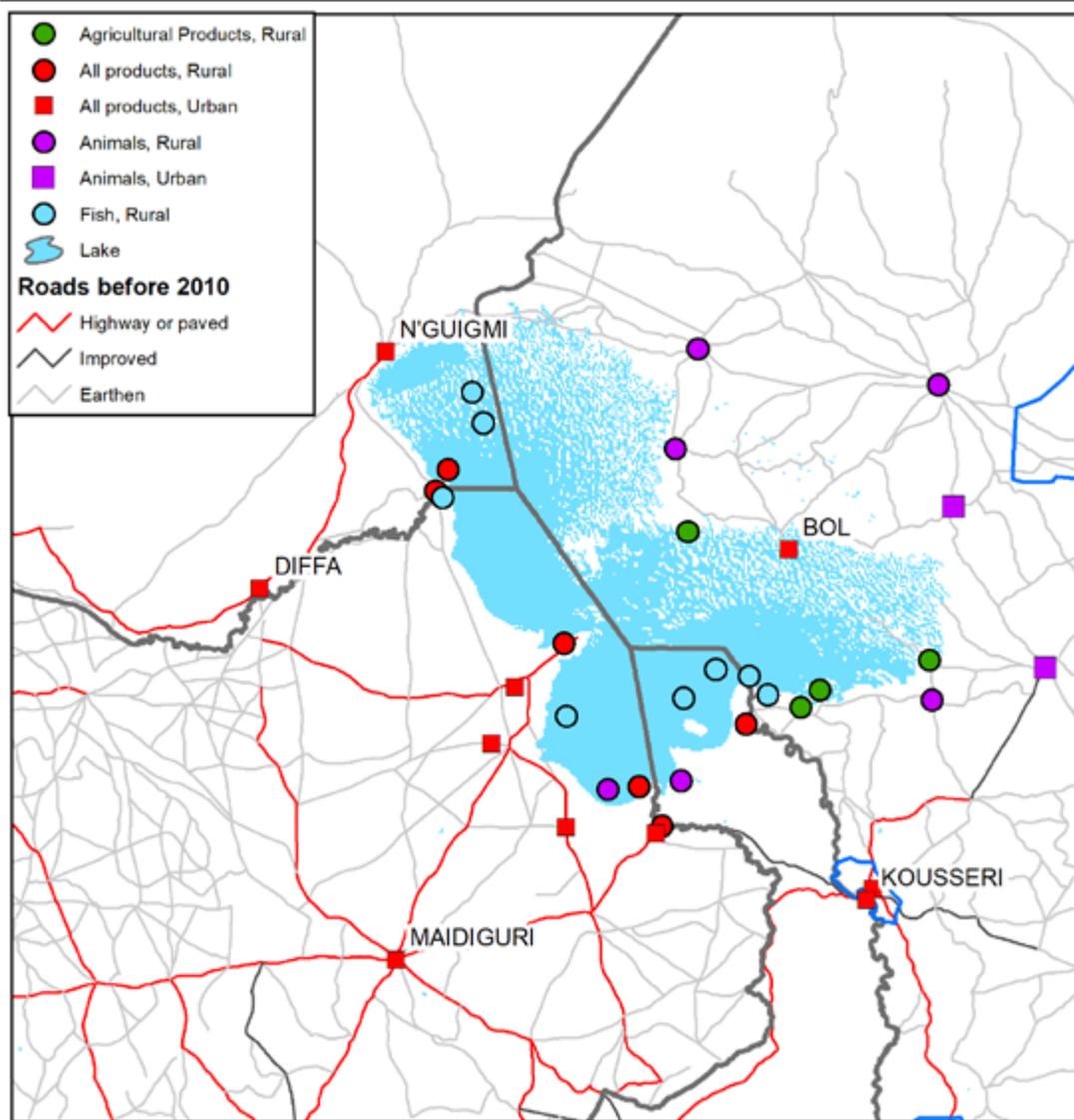
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Appendix 1.A: Supplementary Figures and Tables

Figure A1.1: Local markets in proximity to Lake Chad by type



Source: Blankespoor 2021, technical paper for this report.

Table A1.1: Socioeconomic Outcomes in the Lake Chad Region and Other Regions

	Cameroon			Chad			Niger			Nigeria		
	National	Rest of country	Lake Chad region	National	Rest of country	Lake Chad region	National	Rest of country	Lake Chad region	National	Rest of country	Lake Chad region
Poverty and Human Capital (percent)												
Poverty	26.0	18.8	58.8	38.1	39.8	30.7	45.4	43.4	51.6	39.1	37.7	72.3
Literacy (15+)	77.8	83.7	47.1	41.6	45.5	21.0	33.0	32.8	34.0	71.9	72.4	58.7
Primary Completion (14–25)	72.3	79.0	39.4	29.5	32.8	12.2	25.4	27.8	17.4	78.2	79.0	60.0
Child stunting	28.9	26.9	37.3	39.9	37.0	51.0	43.9	41.7	52.2	36.8	35.8	48.0
Employment (percent)												
Agriculture	45.9	39.0	78.0	76.2	77.0	72.2	74.7	75.5	68.5	43.2	42.2	43.2
Industry	15.6	17.1	8.7	7.0	6.9	10.2	7.9	7.2	7.5	9.4	9.5	9.4
Service	31.0	35.3	10.9	13.6	12.8	17.0	15.6	15.2	20.4	37.1	37.7	37.1
Access to Public Services (percent)												
Piped Water	35.6	39.6	14.8	15.9	16.4	13.8	31.8	34.7	23.5	11.2	10.4	20.7
Improved Sanitation	61.1	66.9	30.8	14.1	16.2	5.7	24.8	28.5	14.3	56.3	56.4	55.1
Electricity	62.2	70.4	19.6	7.7	9.0	2.4	14.4	16.0	10.0	59.4	61.3	38.4

Source: World Bank calculations based on data of the national authorities.

Note: Data on education (literacy and primary education), and employment are based on the latest household surveys conducted in Cameroon (2014), Chad (2018), Niger (2018), and Nigeria (2018). Job category by industry includes only working-age individuals (ages 15–65). Data on poverty are based on the latest harmonized household surveys conducted in Cameroon (2014), Chad (2011), Niger (2014), and Nigeria (2018). Poverty rates are based on the US\$1.90 international poverty line (2011 purchasing power parity). Data on child health (child stunting) and access to public services are drawn from the latest Demographic and Health Surveys available in each country: Cameroon (2018), Chad (2018), Niger (2012), and Nigeria (2018). Rest of country = outside the Lake Chad region; LCB = within the Lake Chad Basin region.

Appendix 1.B: Infrastructure Investment Scenarios Explored in the Technical Paper “Infrastructure and Structural Change in the Lake Chad Region”

New transport infrastructure in the Lake Chad region

New rail line in Cameroon: The renovation of the rail line between Ngaoundéré, Yaoundé and Douala in Cameroon is going through several steps. The World Bank participates in the financing of the southern part of the project for the segment between Douala and Yaoundé, while the EU and European Investment Bank finance the northern part. We assume that the two rehabilitations will happen at the same time; so we consider the whole segment. The government is currently planning to renovate the most used segment between Yaoundé and Douala, the condition of which has deteriorated in the last years. The northern segment between Ngaoundéré and Yaoundé is the most deteriorated. We assume the speed is low on the whole line in the baseline.

New road corridors in Chad: There are several historical corridors between Cameroon and Chad. Tensions in the Far North Region have closed the corridors passing by the Northern part of Cameroon and opened the possibilities for other corridors to develop. The World Bank is currently assessing the possibility to invest in a new corridor in Chad. The proposed corridor links the capital of Chad with Moudoun, the second most important city in Chad, which increases the relevance of the project as it increases domestic connectivity between the main two cities and the regional/ international connectivity of Moudoun.

Complementary policies: Border frictions We assume that trade across locations from a same country only face transport costs while traders across countries have to wait an additional 30 hours to be able to cross the borders. Give the lack of data, we assume a level of 30 hours by default. In the forthcoming counterfactuals, we add a reduction of half border time to the transport investments.

Appendix 1.C: List of Technical Papers

Seven original technical papers were produced to inform the preparation of this report.

Title: “Socioeconomic Trends in the Lake Chad Region”

Authors: Takaaki Masaki (World Bank) and Carlos Rodríguez-Castelán (World Bank)

Abstract: This paper offers a descriptive snapshot of recent socioeconomic trends in the Lake Chad region. It finds that areas around the lake exhibit significantly higher poverty rates compared with other parts of the corresponding countries. The region presents chronic human capital deficits, a historical lack of access to basic services and infrastructure, and—particularly since the onset of the crisis—limited access to large markets. The study also highlights how the level of economic density is especially low in the Lake Chad region relative to other areas, while a chronic lack of connective infrastructure (large distance) and perpetuation of conflict (wide divisions) may delay regional economic progress.

Title: “Climate Change, Rural Livelihoods, and Urbanization: Evidence from the Permanent Shrinking of Lake Chad”

Authors: Remi Jedwab (George Washington University), Federico Haslop (George Washington University), Takaaki Masaki (World Bank), and Carlos Rodríguez-Castelán (World Bank)

Abstract: Many of the world’s lakes are disappearing. Despite an extensive literature on the economic consequences of climate change, the economic effects of diminishing lakes have not been widely investigated. We focus on Lake Chad, a vast African lake that lost about 90 percent of its surface area between 1965 and 1985. For Cameroon, Chad, and Niger, we construct a novel dataset tracking total and urban population patterns at a fine spatial level from the 1950s to the 2010s. We then exploit a difference in differences strategy to estimate the causal effects of the shrinking of Lake Chad between the 1960s and the 1990s on nearby communities. We find relatively slower total population growth in the proximity of the lake, but only after the lake started shrinking. We also find nonnegative effects of the lake shrinking on city population growth nearby, which suggests that climate change might induce refugee urbanization locally.

Title: “Estimating the Spillover Economic Effects of Foreign Conflict: Evidence from Boko Haram”

Authors: Remi Jedwab (George Washington University), Brian Blankespoor (World Bank), Takaaki Masaki (World Bank), and Carlos Rodríguez-Castelán (World Bank)

Abstract: What are the spillover effects of foreign terrorism and conflict on regional economies? Adopting a difference in differences framework to leverage the unexpected rise of the Boko Haram insurgency in Nigeria’s North East in 2009, we study its effects in neighboring areas in Cameroon, Chad, and Niger. We find strong negative effects on regional economic activities (proxied by reductions in nighttime lights), particularly among areas within 200 kilometers of the Boko Haram area. Our findings suggest that this negative impact is concentrated in urban areas and is pronounced among those areas that were initially less developed, for example, in infrastructure, and less well connected to other markets (indicating a lack of trade diversification). We also find that the rise of Boko Haram results in more agricultural burning, a local agricultural practice that is profitable in the short term, but typically leads to long-term environmental and economic losses. Overall, these findings attest to both the short-term and long-term negative impacts of foreign conflicts on regional economies.

Title: “Infrastructure and Structural Change in the Lake Chad Region”

Authors: Mathilde Lebrand (World Bank)

Abstract: Access to infrastructure supports economic development through structural transformation. Roads provide access to markets, while electricity and internet allow for modern production technologies. This paper investigates the links between investments in electricity, internet, and road infrastructure, in isolation and bundled, and economic development in the Lake Chad region. Using data on the expansion of the road, electricity, and internet networks, we provide reduced-form estimates of the impacts of infrastructure investments on the sectoral composition of employment. Using a series of instruments, we estimate a large impact of infrastructure investments, especially from the combination of paved roads and electricity. We then use a spatial general equilibrium model, based on Moneke (2020), to quantify the impacts of future regional transport investments and trade facilitation on economic development. Better regional transport connectivity along the Douala-N’Djamena corridor will bring relatively large welfare gains for the Lake Chad area and lead to increased specialization in manufacturing in southern Cameroon and in agriculture or nontradable services elsewhere.

Title: “Conflict and Climate in the Lake Chad Region”

Authors: Peter Fisker (University of Copenhagen)

Abstract: This paper investigates determinants of conflict across districts and grid cells in the Lake Chad region, which covers parts of Cameroon, Chad, Niger, and Nigeria. Information on conflict incidence and intensity is combined with remote sensing data on greenness, temperatures, rainfall, and the standardized precipitation-evapotranspiration index (SPEI) in all years between 2001 and 2018. The results indicate that conflict in the Lake Chad region is affected by climate anomalies: higher-than-usual temperatures lead to an increase in conflict activity measured at the district and grid cell levels. Greenness anomalies also affect conflict negatively, but more strongly if one focuses on the growing season in cropland areas. However, rainfall and the SPEI do not exhibit similar relationships with conflict. Possible reasons for this may be that (a) temperature anomalies are more important than agricultural drought as predictors of conflict or (b) measurement errors in the rainfall and SPEI data under analysis.

Title: “Building Rural Development in the Lake Chad Region”

Authors: Brian Blankespoor (World Bank)

Abstract: Agriculture is the main sector of economic activity among individuals and households in the Lake Chad region. However, limited market accessibility and, more recently, conflict hinder agricultural activity and therefore pose major challenges to the economic recovery and development of the region. This paper uses panel methods to examine the relationship between access to markets and land cultivation in the region over the past three decades using recent satellite and spatial data following the framework of Berg, Blankespoor, and Selod (2018). The results provide evidence that an increase in market access is associated with an increase in cultivated land and is positively associated with an increase in local agricultural gross domestic product (GDP). Even so, conflict because of the rise of Boko Haram in the past decade may attenuate gains because the proximity to conflict events in the previous year is associated with less cropland across the entire region and less nighttime lights for a panel of 104 local markets near Lake Chad.

Title: “Trade Patterns and Trade Networks in the Lake Chad Region”

Authors: Peter Walkenhorst (American University of Paris)

Abstract: This paper synthesizes existing evidence on trade patterns and trade networks in the Lake Chad region and on the significant disruptions encountered by trade flows in the region. It argues that conflict and the corresponding mitigation measures have affected trade flows in multiple ways. First, they affect important local production and markets, such as lake and river fish (Maiduguri is a hub of the trade), and food staples, such as sesame, onion, and

pepper. Second, they also impact significant trade flows passing through the region. From the north to the south, the cattle trade that historically passed through the region on both the northern and southern shore of the lake now heads eastward toward Central Africa instead. From the south to the north, important transit trade, such as along the Douala-N'Djamena corridor, is now diverted through Moundou. Third, they affect trade with the two large economies, Cameroon and Nigeria, which has relocated from the conflict-ridden northern regions to safer border areas.

Ornaments

by Maryam Umar Maigida (Nigeria)

Le Pecheur de Kotoko (The Fisherman from Kotoko)
by Abacar Abali Liman (Cameroon)



Sultanate in breakdown
by Alichina Allakaye (Niger)



The Tears of a Lake
by Djitara Tendjibaye (Chad)

*People forge ideas, people mold dreams, and people create art.
To connect local artists to a broader audience, the cover of this report
features art from the Lake Chad region.*