

THE LAKE CHAD DEVELOPMENT AND CLIMATE RESILIENCE ACTION PLAN

SUMMARY

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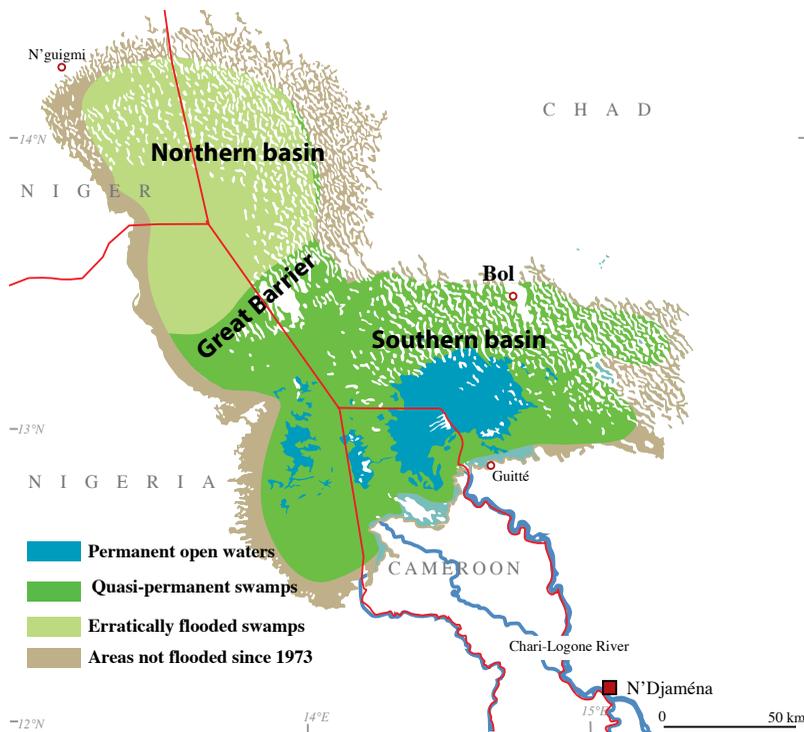
The Lake Chad Development and Climate Resilience Action Plan (LCDAP), or *Plan de développement et d'adaptation au changement climatique du lac Tchad (PADLT)*, is an initiative undertaken by the Lake Chad Basin Commission (LCBC) and its six member countries: Cameroon, Central African Republic, Chad, Libya, Niger, and Nigeria.

A Changing Lake in Response to Regional Rainfall Variability

Lake Chad is a tropical lake with related wetlands. It has a northern and a southern basin of roughly the same sizes, which are separated by a sand barrier, referred to as the Great Barrier (see Figure 1). It is very shallow with a general depth of less than four meters. The main rivers feeding the Lake flow in its southern basin. When the

water level is too low, the Great Barrier prevents water from flowing to the Northern Basin, causing that segment of the Lake to dry up. The Lake is shared by Cameroon, Chad, Niger, and Nigeria. Parts of the Central African Republic are in its active hydrological basin and some of the aquifers connected to the Lake are in Libya.

FIGURE 1: AVERAGE SITUATION OF LAKE CHAD IN ITS “SMALL STATE,” FROM 2010-2015



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

Over the course of the last 100 years the lake area has significantly varied in size (see Table 1). The average size of the Lake declined from over 22,000 km² in 1960 to about 1,700 km² in January 1985, but has since that time increased again to an average of approximately 8,000 km² during the 2000-2015 period.

The Lake's size variability is explained by rainfall variations over its basin, particularly over the basin of the Chari-Logone River, which accounts for about 85 percent of water inflows to the Lake. There are four different states of the Lake depending on rainfall and water inflows. The "Small State" Lake Chad, observed since 1991, is the most favorable for fishing, livestock and agriculture.

TABLE 1: THE DIFFERENT STATES OF LAKE CHAD OVER TIME DEPENDING ON RAINFALL AND WATER INFLOWS

Lake Chad State	Dry Small	Small	Medium	Large
Inflows from the Chari (km ³ /year)	< 15	15 – 34	35 – 43	> 43
Water level (m asl)	dry northern basin	different levels	280 - 282	>282.3
Number of water bodies	several	several	one	one
Total surface of the Lake (km ²)	2000 – 6000	6000 – 14000	15000 – 19000	20000 – 25000
Flooded area of the northern basin (km ²)	0	0 – 8000	9000	10000
Dominating landscape	swamps and savannas	swamps	dune archipelago	open water
Aquatic vegetation	++	+++	++	+
Time Period	some years in the 1970s and mostly in the 1980s	1973-present except for "Dry Small" periods	1954-1972	1953-1954

Source: Expert Group Review, 2014.

Lake Chad: A Productive Yet Poor and Vulnerable System

Within its watershed, Lake Chad is a large, productive socio-ecosystem, yet with much poverty, demographic pressure, and security threats.

A HIGHLY PRODUCTIVE SOCIO-ECOSYSTEM

The Lake, its banks and its islands are a source of livelihood for nearly two million people. They are also a food-exporting hub (see Figure 2), playing a key role for food security of a hinterland with nearly 13 million inhabitants and two metropolitan centers, N'Djamena, the

capital of Chad, and Maiduguri, the capital of the State of Borno in Nigeria. The entire basin is home to about 50 million people as of 2015.

The rich biodiversity of the Lake has enabled riparian communities to develop productive activities based on fishing, agriculture, and livestock farming. The dynamism of the area is mainly based on a complex system, adapted to the variability of the environment and characterized by the articulation of: mobility, multi-activity, and multi-functionality. Mobility

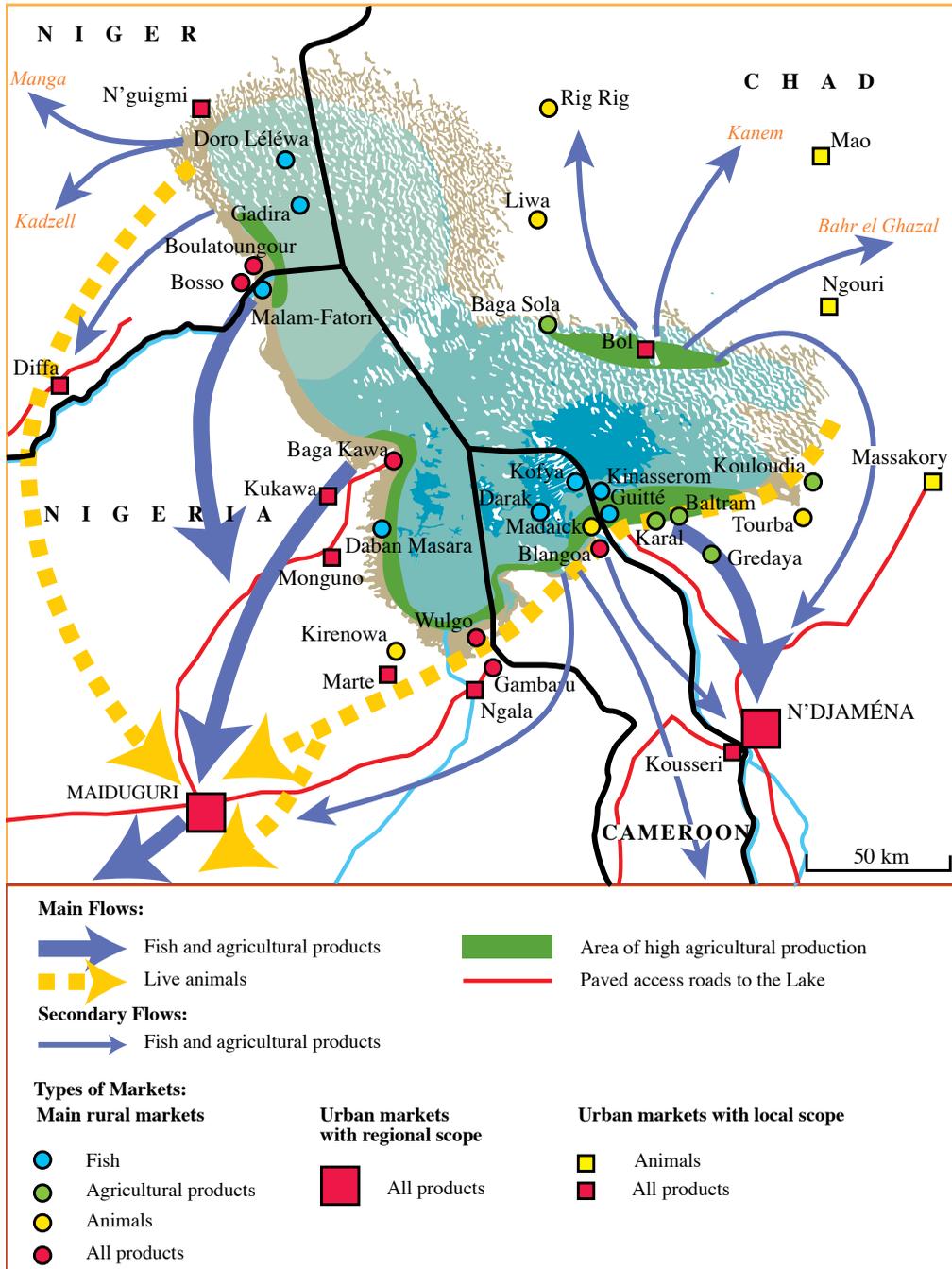
refers to people responding to changing natural resources. Multi-activity means that a dominant proportion of the population of the Lake practice several activities (fishing, livestock, agriculture, and also trade, and crafts) to secure revenues. Multi-functionality refers to the successive use of the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

The value of Lake Chad resides therefore in the ecosystem services it provides, and these are particularly precious in its Sahelo-Saharan regional environment characterized by aridity and the erratic availability of water resources. Recognized by the Ramsar Convention, the Lake is being classified a World Natural Heritage Site by UNESCO.



Photo credit: G. Margin

FIGURE 2: LAKE CHAD'S CONTRIBUTION TO FOOD SECURITY IN THE REGION



Source: Magrin, Lemoalle, Pournier, 2015. Atlas du lac Tchad.

A VULNERABLE SOCIO-ECOSYSTEM FACING NUMEROUS RISKS

Yet Lake Chad is also a very fragile system. Demographic pressure exacerbates the vulnerability of a poor population that already has low access to basic services and infrastructure. Moreover, the Lake is exposed to potential modifications of its hydrological conditions that a changing climate could trigger. It is also threatened by pollution and insecurity.

Hydrological shifts

The Lake system is highly vulnerable to a significant change in the water inflows from its tributary rivers. Indeed, the “Small State” Lake Chad, observed since 1992, is the most favorable with regards to the ecosystem

services it provides. This “Small State” is optimal in terms of the availability of land for agricultural production and grazing during the annual dry season when the water recedes. Both a “Dry Small Lake Chad” as well as a “Medium Lake Chad” would have less productive lands available for agriculture and livestock farming.

The frequent return to a ‘Dry Small Lake Chad’ state would be the worst scenario. It is characterized by the absence of water inflows to the Northern Basin of the Lake, as observed in decades of drought, and would compromise all the activities on which depend the livelihood of about 500,000 inhabitants and the food security of nearly four million people in that part of the Lake’s hinterlands. The drying-up of the northern half of the Lake could also lead to



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migration to its southern shores, intensifying pressure on resources for agriculture, fishing, and livestock farming in the rest of the lake area and resulting in conflicts. This transition to a “Dry Small Lake Chad” could result from a decrease in precipitation due to climate change or to a significant increase in water withdrawals from the rivers feeding the Lake, mainly from the Chari-Logone River.

Pollution risks

Due to its very shallow depth and the prevalence of wetlands, the Lake system is highly vulnerable to pollution. Yet the exploitation of hydrocarbons is expanding in the basin and the Lake itself, and the inadequate use of pesticides in agriculture may already have an impact on animal health (ruminants and fish). Untreated municipal wastewater and industrial and mining effluents are also a risk.

Low Human Development Index and levels of basic services and infrastructure

The human development indicators for the Lake Chad area are far lower than national averages, which themselves are low compared to international standards. The area generally lacks basic public social services and infrastructure such as education, health, water, roads, and electricity. (Lemoalle and Magrin, 2014; Magrin et al., 2015).

One of the highest population growth rates in the world

The Lake Chad Basin is experiencing one of the highest rates of population growth in the world which could heighten risks related to the over-exploitation of natural resources and to socio-political instability, especially if not enough jobs are created to provide a living for a growing number of young adults. This demographic pressure will also make even more pressing the need to improve basic services and infrastructure.

Insecurity

In 2014 and 2015, the Lake Chad region was struck by extensive violence, associated with the Boko Haram movement, particularly in the whole of northeastern Nigeria as well as in the border areas of Niger, Cameroon, and Chad. Tens of thousands of people have been displaced. Trade has been disrupted and the regional economy destabilized. These challenges have strengthened the integrative dynamics developed in recent years between the States bordering the lake: border agreements, joint mobilization and solidarity to restore security, and joint projects. This cooperation is now expected to become more concrete and effective in the field of economic development, including in particular the proposed Action Plan.

Information Gaps and Climate Uncertainties Make the Management of the Lake Socio-ecosystem More Complex

The population in the Lake’s basin will double over the next 30 years, likely causing an increase in water withdrawals for human consumption, irrigation, and industries. Yet, according to models from the Intergovernmental Panel on Climate Change (IPPC), future changes in precipitation in this part of the world are unknown. Moreover, information on groundwater, water withdrawals, sedimentation

in the Lake and the rivers feeding it, as well as the functioning of floodplains is inadequate. In this context, the management of the Lake will need to: (a) prioritize “no regret investments and policies” which will be beneficial in all scenarios, and (b) improve the knowledge base to reduce uncertainty and refine feasibility studies before engaging in costly, large-scale, high-risk infrastructure development.



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A Ten-year Multi-sectoral Development and Climate Resilience Action Plan to Turn Lake Chad into a Pole of Regional Rural Development

In order to respond to these challenges, LCBC and its member States, with support from the World Bank Group and in coordination with the French Development Agency/*Agence Française de Développement (AFD)*, have prepared the Lake Chad Development and Climate Resilience Action Plan (LCDAP) for the period of 2016-2025. The core idea of the Plan is that, in parallel to the restoration of peace and security, there is a need to turn Lake Chad into a pole of regional rural development. This objective is in line with LCBC strategic planning documents developed

by LCBC during the past years, including the Vision 2025, the Strategic Action Plan, and the Water Charter.

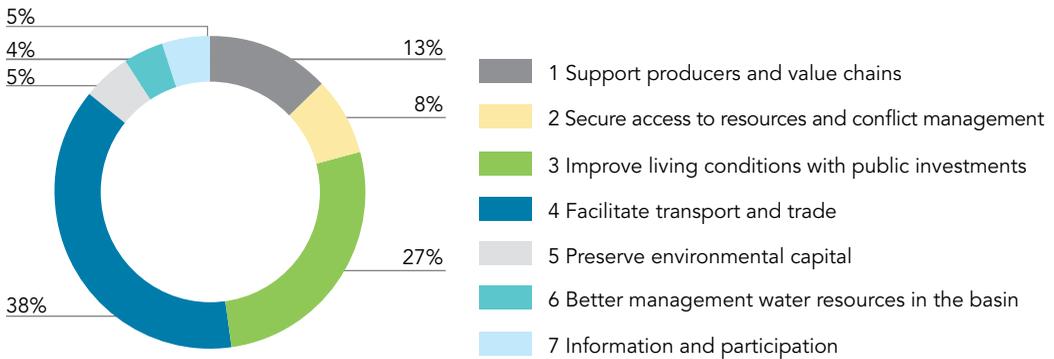
To meet its objectives, the Plan intends to contribute significantly to food security, employment, and the social inclusion of youth by improving, in a sustainable way: (a) the living conditions of populations settled on the Lake's banks and islands, and (b) the resilience of a system characterized by strong demographic growth, high hydrological variability, and climate uncertainty.

Seven Priority Themes

The LCDAP proposes a total of seven priority themes, grouping a total of 173 activities (see Figure 3) summarized below. Some of the projects and measures included in the present Action Plan come from LCBC's five-year investment plan (2013-2017) and its Emergency Program for youth and vulnerable groups in the

region of Lake Chad (PURDEP) 2015-2016, as well as recent national planning documents for at least part of Lake Chad. Others, not identified in those documents, have been included in the Action Plan in order to meet its stated objective for a ten-year planning horizon.

FIGURE 3. INVESTMENT DISTRIBUTION BY THEME



PRIORITY THEME #1: SUPPORTING PRODUCERS AND THEIR VALUE CHAINS

Supporting producers and their value chains will increase the productivity and resilience of food production systems (agriculture, fisheries, and animal husbandry). The types of activities under this theme include appropriate, small, and flexible hydraulic infrastructure as well as support services (i.e. extension, credit, access to inputs, animal health, support to producers’ organizations and value chains, post-harvest operations).

PRIORITY THEME #2: SECURING ACCESS TO NATURAL RESOURCES AND MANAGING CONFLICTS

This theme includes activities for securing, in an inclusive manner, access of vulnerable groups to agriculture land, pasture and fishery resources and, at the same time, improving the co-existence of agriculture, livestock husbandry, and fisheries in the same area to prevent conflicts and favor intensification. The types of activities considered include local and participatory territorial planning, land rights, securing pastoral routes, pastoral water points, and fishery regulations.

PRIORITY THEME #3: IMPROVING LIVING CONDITIONS THROUGH PUBLIC INVESTMENTS

The type of activities considered include rural and urban water supply, mostly from groundwater and when possible using solar energy; sanitation and hygiene; urban and rural electrification with special emphasis on solar; education adapted to mobile populations; health, including local health stations; construction of a regional hospital and prevention of epidemics such as Cholera and AIDS; and support to family planning and girls education to curb population growth.

PRIORITY THEME #4: FACILITATING TRANSPORT AND TRADE

Activities included in this theme are the construction, improvement, and rehabilitation of roads and tracks; the improvement and management of navigation routes; harmonization of trade regulations and standards; and the improvement of practices in cross-border trade.



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PRIORITY THEME #5: PRESERVING THE ENVIRONMENTAL CAPITAL OF THE LAKE AND ITS BASIN

This will include afforestation and reforestation; soil and water conservation programs; promotion of alternatives to wood-based energy; improving the sustainability and profitability of gathering and hunting practices (natron, spirulina, varan, wood); protection of the Kuri cows; and developing a value chain for invasive aquatic weeds.

PRIORITY THEME #6: BETTER MANAGING THE WATER RESOURCES OF THE BASIN

Concerted management of the resource is required at the basin level to manage trade-offs, avoiding that future water withdrawals increase so much as to prevent water inflows into the Northern Basin of the Lake. Sound management is also required to manage increasing pollution risks (agricultural, urban, industrial, mining, and oil sector). Foreseen activities include the full implementation of the Water Charter and pollution management.

PRIORITY THEME #7: DISSEMINATING INFORMATION, IMPROVING KNOWLEDGE, AND MONITORING OF THE ENVIRONMENT

Activities considered include water quantity and quality monitoring and information systems; assessing current withdrawals (surface and groundwater); assessing the potential use of groundwater; analysis of the hydrological functioning of flood plains and areas downstream of dams; exploring the possibility to develop the Great Barrier Reef so as to regulate the flow of water between North and South basins; assessment of current sedimentation conditions to ascertain the utility of dredging programs in the Lake; study on the hydraulic functioning of the Komadougou Yobe; a comprehensive feasibility study of the Congo basin water transfer; the setting-up of a monitoring and information system on biodiversity, demography, and the economy of the Lake; and finally, encourage the participation of the civil society in the debates related to the management of natural resources in the basin.

Interventions Focus on Three Distinct Geographic Zones depending on Their Relationships with the Lake

The activities proposed under the Plan focuses on three different geographic zones around the Lake. Figure 4 depicts the allocation of resources in each geographical zone.

Zone 1 corresponds to the area of Lake Chad, including its banks and islands, covered by the nearby administrative districts, with around two million inhabitants who live directly from the resources of Lake Chad. This area would get a little more than half of the planned investments.

Zone 2 is the extended hinterland of Lake Chad, including major riparian regions populated by 13 million of inhabitants, in which most of the commercial and migratory relations of Lake Chad

take place. This space is estimated to receive approximately 37% of planned investments.

Zone 3 refers to the active hydrological basin of Lake Chad with nearly 50 million inhabitants. This area is related to the Lake by the effects it may have on the quality and quantity of water flowing into the Lake. The Action Plan tentatively allocates 11% of investments to that zone.

The interventions proposed in the Action Plan are eligible in one of three geographical zones depending on the priority theme it belongs to. Table 2 indicates the geographical zone considered for each priority theme.

FIGURE 4: PROPOSED INVESTMENTS BY GEOGRAPHIC ZONE

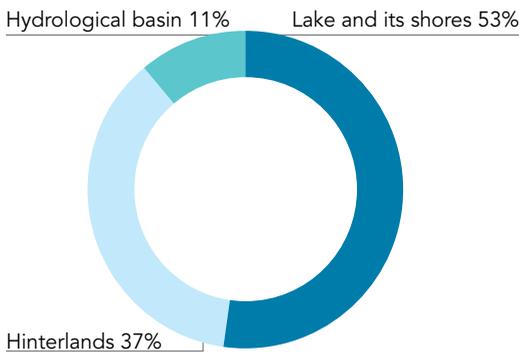


TABLE 2: PRIORITY THEMES AND GEOGRAPHIC ZONE

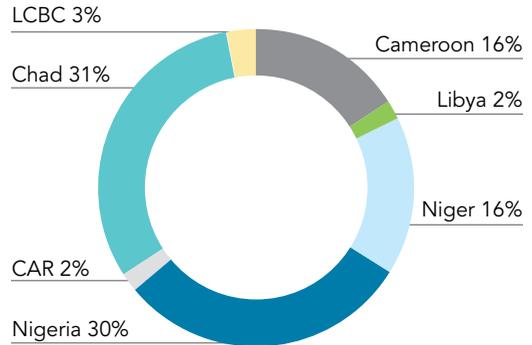
Priority Theme	Geographic Zone
Supporting producers and value chains	the Lake area
Securing access to resources and managing conflicts	the Lake area
Improving living conditions	the Lake area
Promoting trade and transport	the Lake and its hinterlands
Preserving environmental capital	Hydrological basin
Better managing water resources	Hydrological basin
Enhancing information and participation	Hydrological basin

Responsibility for Implementing the LCDAP Rests Mainly on the Six Member States, with LCBC Coordination and Support

The four riparian States plus Libya and the Central African Republic, local powers (local governments or customary authorities), the LCBC, and civil society will be responsible for implementing the proposed actions.

The distribution of proposed investments between member states and the LCBC is indicated in Figure 5.

FIGURE 5: DISTRIBUTION OF INVESTMENTS BY COUNTRY AND LCBC



Achieving the Action Plan's Objectives Will Require Strengthening the Lake Chad Basin Commission

Successful implementation of the Action Plan will require LCBC to implement a set of reform measures to become a more effective subregional institution in fulfilling its mandate. In parallel to the reform process, the Plan would

enhance the capacity of LCBC in terms of data collection, sharing of information, and carrying out analyses useful to governance of the basin's shared natural resources.



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This document has benefited from Passages-ADAPes cooperation for the reproduction of maps from « Atlas du lac Tchad » (2015).

