LAKE CHAD BASIN

Impact of extreme weather and climate events on livelihoods and food security

acaps
Thematic report
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CRISIS OVERVIEW

Since the 1970s, recurrent extreme weather and climate events have been affecting the Lake Chad Basin (LCB), which includes Adamawa, Borno, Diffa (Niger), Far North (Cameroon), Lac (Chad), and Yobe (Nigeria). These events have been affecting people's livelihoods by limiting the availability of natural resources, such as water, and land. A strong population growth, going hand in hand with greater pressure on resources, has intensified the competition for access to these, causing intercommunal conflicts between people pursuing different livelihoods (Adelphi 15/05/2019; WB 06/2021).

Intercommunal conflicts over access to land and natural resources have caused the displacement of thousands of people. These displaced people add to those displaced by the activity of non-state armed groups and military operations. Those who lived mainly from agriculture, pastoralism,[1] and fishing heavily depend on humanitarian aid (Le Monde 24/05/2022; UNHCR 21/01/2022 and 18/05/2022).

The activity of non-state armed groups and military operations in the region limit the ability of communities —who traditionally move to other areas when climatic conditions change— from moving and finding other economic opportunities. People living in affected areas often use negative coping strategies to access scarce resources (Adelphi 15/05/2019; IOM 25/08/2021). Rising food prices and low agricultural production – often linked to rainy seasons that start too late and do not last long enough or the destruction of crops by seasonal floods – contribute to the deterioration of food security. This situation is expected to worsen as climate predictions indicate a rise in temperature and an increased frequency of extreme weather events in the region in the coming years (EC 09/02/2022).

HUMANITARIAN CONSTRAINTS

The activity of armed groups, military operations, and movement restrictions imposed by state authorities, constrain humanitarian access especially in Adamawa, Borno, and Yobe states in Nigeria.

Certain areas of Borno state and Far North region become completely impassable during the rainy season (OCHA 15/11/2019; IFRC 03/09/2021).

LIMITATIONS

Several prediction models on how the weather will evolve over the next few years are at odds with one another, making it difficult to navigate the plethora of information available.

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[1] Pastoralism involves an extensive farming method practiced by nomadic peoples based on the exploitation of natural vegetation.

KEY FIGURES

54,000
PEOPLE DISPLACED BY NATURAL DISASTERS SINCE 2018
(IOM 14/07/2022, 30/11/2021, 13/07/2022, AND 15/07/2022)

50,000
PEOPLE DISPLACED BY INTERCOMMUNAL VIOLENCE SINCE 2018
(IOM 14/07/2022, 30/11/2021, 13/07/2022, AND 15/07/2022)

5.5M
PEOPLE EXPERIENCING CRISIS (IPC PHASE 3) OR WORSE FOOD INSECURITY
(OCHA 20/06/2022)

11M
PEOPLE IN NEED OF HUMANITARIAN ASSISTANCE
(OCHA 20/06/2022)

ABOUT THIS REPORT

This report aims to explore the impact of extreme weather and climate events on the humanitarian situation in the LCB. Since the 1970s in West and Central Africa, river floods and agricultural and ecological droughts have been increasing while average rainfall has been decreasing. These phenomena have an impact on availability of resources and land, and consequently on the economic and living conditions of the regions' populations.

Conflict is the main cause of population displacement and the loss of livelihoods in the region. It is through this prism that many studies on the LCB approach the subject. This report puts extreme weather and climate events at the centre of the debate. It tries to determine how they contribute or interact with other factors to aggravate the difficulties in accessing economic resources and food. The LCB is often considered one of the regions of the world that best illustrates the impact of climate change, but the conflict since 2009 has made it difficult to distinguish how much of the deterioration in the humanitarian situation is attributable to the climatic phenomenon.

Methodology

This report is based on secondary data, including academic, humanitarian, journalistic, and institutional sources. Historical data on extreme weather events over the past five years is mirrored with the deteriorating humanitarian situation in the LCB.

On each theme, the report gives an overview of the situation in the different regions concerned, depending on the availability of information. Since regions are not affected in the same way, some sections focus more on a particular region than others. The **Outlook section** relies on various sources using different prediction models.

Terminology: climate change

Climate change can be conceived as "a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer" (IPCC 2018). This definition refers to all the variations in climatic characteristics in a given place over time, whether natural or resulting from factors related to human activity.

The effects of climate change in Africa have increased the frequency and intensity of droughts and reduced the growth rates and productivity of pastoral systems. Between 1961 and 2021, climate change has reduced agricultural productivity growth by 34% in Africa, which is more than in any other continent (IPCC 28/02/2022). The situation particularly affects food security in arid areas. This trend is expected to worsen given the number of people vulnerable to increased desertification and declining yields (WMO 19/10/2021).

Projections point to increased meteorological droughts and increased heavy rainfall and flooding, confirming that there will be substantial impacts on African ecosystems already affected by climate change during the mid-21st century. Constraints related to water availability are likely to significantly worsen. Rising temperatures and changes in precipitation are very likely to reduce the productivity of cereal crops, with significant negative effects on food security. These changes threaten food, health, and economic security and are increasingly becoming drivers of conflict (IPCC 09/08/2021).

This data takes on a particular dimension in the LCB, where the variability of the surface of the lake, floods, and frequent droughts put pressure on the population – whose main means of subsistence (agriculture, livestock, and fishing) are highly climate-sensitive (Adelphi 15/05/2019). Heat waves, droughts, and seasonal rainfall variability greatly increase the needs of the affected people and reduce humanitarian access in the region (OCHA 15/11/2019).

BACKGROUND: LAKE CHAD BASIN

The Lake Chad basin is one of the largest catchment areas in Africa, covering nearly 8% of the continent. It is an endorheic basin, meaning its waters do not reach any oceans. The lake borders four countries: Cameroon, Chad, Niger, and Nigeria. The Chari River, with its main tributary, the Logone, provides 90% of the inflow to the lake, while the remaining 10% comes from the Komadugu-Yobe River system.

There are four identified climate categories in the basin: the Saharan climate (average annual rainfall of less than 100mm), the Sahelo-Saharan climate (average annual rainfall of 100–400mm), the more humid Sahelo-Sudanian climate (average annual rainfall of 400–600mm), and the Sudano-Guinean climate (average annual rainfall of 600–1,500mm). The region experiences high temperatures and very low humidity throughout the year, except during the rainy season from June–September (CBLT 07/07/2021).

The LCB is home to over 45 million people from around 70 ethnic groups. Each group corresponds to a specific economic activity, culture, and language. In Lake Chad province, the Boudouma are mainly fishermen, the Arabs practice more herding, and the Massa and Moundang are more sedentary livestock breeders. The Hausa and Fulani make up the majority in Diffa and northeastern Nigeria and live mainly on pastoralism, while the Kanuri, who traditionally are sedentary and practice agriculture, fishing, and trade, constitutes a dominant ethnic group in the state of Borno. In the Far North region of Cameroon, Arab Choa herders and Mousgoum fishermen and farmers coexist with several other ethnic groups mainly practising agriculture and livestock cultivation. The lake is a source of drinking water for this population, who also uses it for sanitation and irrigation (CBLT 07/07/2021; The Conversation 30/09/2020).

OVERVIEW OF THE LCB HUMANITARIAN CRISIS

For nearly 13 years on 14 April 2022, the activity of armed groups in the LCB had caused the death of dozens of people, displaced more than three million people, and caused the closure of more than 1,000 schools. More than 4.1 million people were expected to be in need of food assistance and experiencing severe levels of acute food insecurity. Recurrent climate-related shocks (floods, prolonged drought, more and more frequent sand and dust storms, extreme temperatures, and violent winds), which affect food security and the already limited means of subsistence for the populations in this region, also aggravate the security situation (OCHA 14/04/2022; Equal Times 02/05/2022; Wilson Center 26/07/2020). Extreme weather and climate events are not the main cause of the humanitarian situation in the LCB. They do, however, contribute greatly to the aggravation of the needs of the people affected by the violence of armed groups and whose freedom of movement is limited by the activity of armed groups or administrative restrictions by governments (OCHA 15/11/2019; IFRC 03/09/2021).

The ability of people affected by climate shocks to adapt to change has decreased with the presence of non-state armed groups and armed forces in different locations disrupting trade routes or transhumance[2] areas. These disruptions increase the competition for access to resources in an increasingly restricted space, generating recurrent intercommunal conflicts (Adelphi 15/05/2019).

The decline in agricultural, pastoral, and fishery production also contributes to the increased recruitment of armed groups in the region. The loss of their means of subsistence linked to the reduction of the surface of the lake pushes some people to join these groups (Owonikoko and Momodu 07/08/2020; Crop Monitor 13/08/2020).

Conflict and insecurity

The humanitarian crisis in the LCB began in 2009 with the start of the activity of Boko Haram in northeastern Nigeria (particularly in the states of Adamawa, Borno, and Yobe). With the fragmentation of the group into several rival factions in 2013, the activity of armed groups started spreading geographically to Far North (Cameroon), Lac (Chad), and Diffa (Niger) (AFD 04/2018).

Since its creation, Boko Haram has been responsible for numerous armed attacks against civilians, incidents of kidnapping for ransom, attacks on military positions, looting and extortion events, the destruction of markets, sexual violence, and forced recruitment.

The conflict took a new turn in 2021, notably with the death of Abubakar Shekau, the leader of Boko Haram, and the growing domination of the Islamic State in West Africa Province (ISWAP) in the region. While Boko Haram has been preying on civilians to coerce them into joining, ISWAP has been trying to gain their sympathy to collect their zakat.[3] ISWAP has also been using livelihoods as a crucial bargaining tool with communities. Instead of attacking civilians, ISWAP's attacks mainly target security forces and humanitarians. This strategy is not only so they can control border areas between Cameroon, Chad, Niger, and Nigeria. ISWAP also aims to appear as the only group able to meet the needs of the populations through a redistribution system (ISS 24/01/2022 and 13/07/2021; ICG 29/03/2022; VOA 19/11/2021). As at 17 January 2022, the conflict had produced over 2.8 million IDPs and 265,000 refugees. Borno state in Nigeria had the highest number of displaced people, with over 1.6 million IDPs. Attacks by armed groups, the operations of the Multinational Joint Task Force (a force consisting of military personnel from Cameroon, Chad, Niger, and Nigeria), and climatic hazards are the main triggers of these displacements (OCHA 17/01/2022).

Lake size fluctuations

The high variability of the total surface area of Lake Chad, which has shrunk by 90% over the past 60 years because of intermittent droughts since the early 1970s, is often considered the most obvious illustration of the sensitivity of this region to extreme weather and climatic events. From 26,000km2 in 1963, the lake has shrunk to around 1,500km as at 2021.2 This data is not to predict the disappearance of the lake but to illustrate extreme variations from one year or decade to another, affecting the living conditions of the populations in the region (Adelphi 15/05/2019; DTE 23/02/2021).

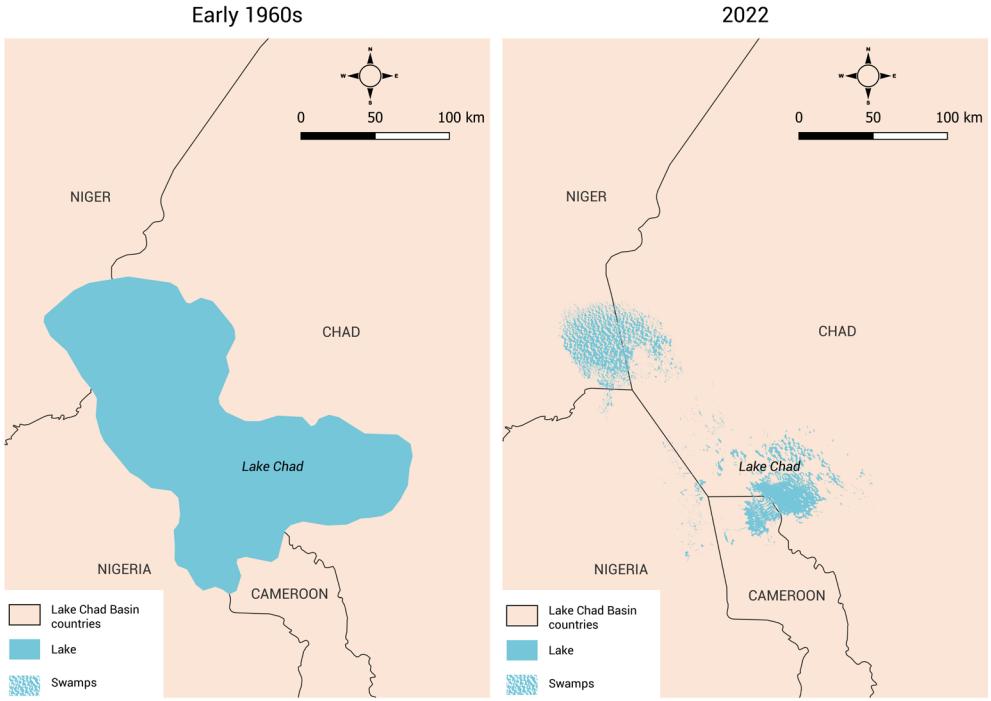
While there is no scientific consensus on their real impact, several factors still contribute to the shrinking of the lake. In particular, global warming seems to play a key role through the increase in temperatures and the modification of precipitation patterns. In the LCB, temperatures are increasing at rates above the global average, particularly affecting agriculture (Adelphi 2018; Kitoto 12/01/2016; Owonikoko and Momodu 07/08/2020).

Demographic pressure is also an aggravating factor in the reduction of the lake surface. The number of people living around the lake has increased from 13 million to approximately 40 million between 1960–2022. The heavier exploitation of the lake's resources through more intense agricultural practices and fishing, as well as overgrazing, has accompanied this increase in population (Kitoto 12/01/2016; Owonikoko and Momodu 07/08/2020).

[2] Transhumance refers to the seasonal movement of a herd to reach an area where it can feed.
[3] In Islam, zakat refers to legal alms or the tax one must pay on his property according to a determined rate.

The diversion of water from the lake and its feeder rivers for irrigation projects by the various states that share Lake Chad is another significant factor to it drying up. Each state has repeatedly implemented projects to divert the lake from its trajectory to meet increasing irrigation needs. Inversely, the drop in the level of the lake has also been affecting these projects, which have been responsible for about 30% of the lake's drying up since the 1960s (Owonikoko and Momodu 07/08/2020).

Lake Chad water level fluctuations



Source: Contains modified Copernicus Sentinel data 2022

Floods

In Diffa region (Niger), heavy rains and overflowing rivers during the rainy season (mid-June to September) cause recurrent flooding. Since 2017, floods have been affecting more and more people every year across the country. Over the past three years, flooding has affected more than 63,000 people in Diffa: 45,847 in 2019, 7,203 in 2020, and 10,000 in 2021. The floods have destroyed houses and hectares of crops, forcing people who have lost their means of subsistence or their homes to leave at least temporarily (OCHA 15/11/2019, 07/09/2020, 11/10/2021, and 15/02/2022).

In 2020, Far North region in Cameroon experienced flooding on an unprecedented scale. Torrential rains affected at least 150,000 people, destroying homes, fields, and road infrastructure and forcing thousands to leave their homes. In 2021, the rainfall trend was very different because of a delay in the rainy season and a low rainfall average recorded. Regardless, flash floods still damaged 1,500 hectares of agricultural land and displaced 647 people in the department of Mayo-Sava. The contrast in terms of rainfall between 2020–2021 illustrates the extreme variability of the climate in the LCB (OCHA 14/04/2022; IFRC 03/09/2021; Le Monde 08/12/2020).

In North East Nigeria, frequent flooding affects thousands of people in need every year. In 2019, torrential rains and overflowing water from the Niger and Benue Rivers led to the displacement of at least 19,000 people. These floods, the strongest recorded in seven years, affected more than 40,000 people in Borno and more than 100,000 in Adamawa state. Aside from damaging shelters and peoples' belongings, the floods also damaged around 4,000 hectares of agricultural land, destroying the crops (maize, sorghum, millet, and cowpeas) that were the main source of food for the consumption of displaced people. More recently in August 2021, flooding displaced over 74,000 people in Adamawa state (OCHA 15/11/2019 and 09/02/2022; FloodList 20/09/2021).

While less affected than other regions across Chad, Lac province still experiences recurrent floods. In 2020, flooding affected more than 33,000 people and destroyed 11,380 hectares of sown fields. The destruction deprived farmers of that season's production, most of which was intended for household consumption (OCHA 06/11/2020).

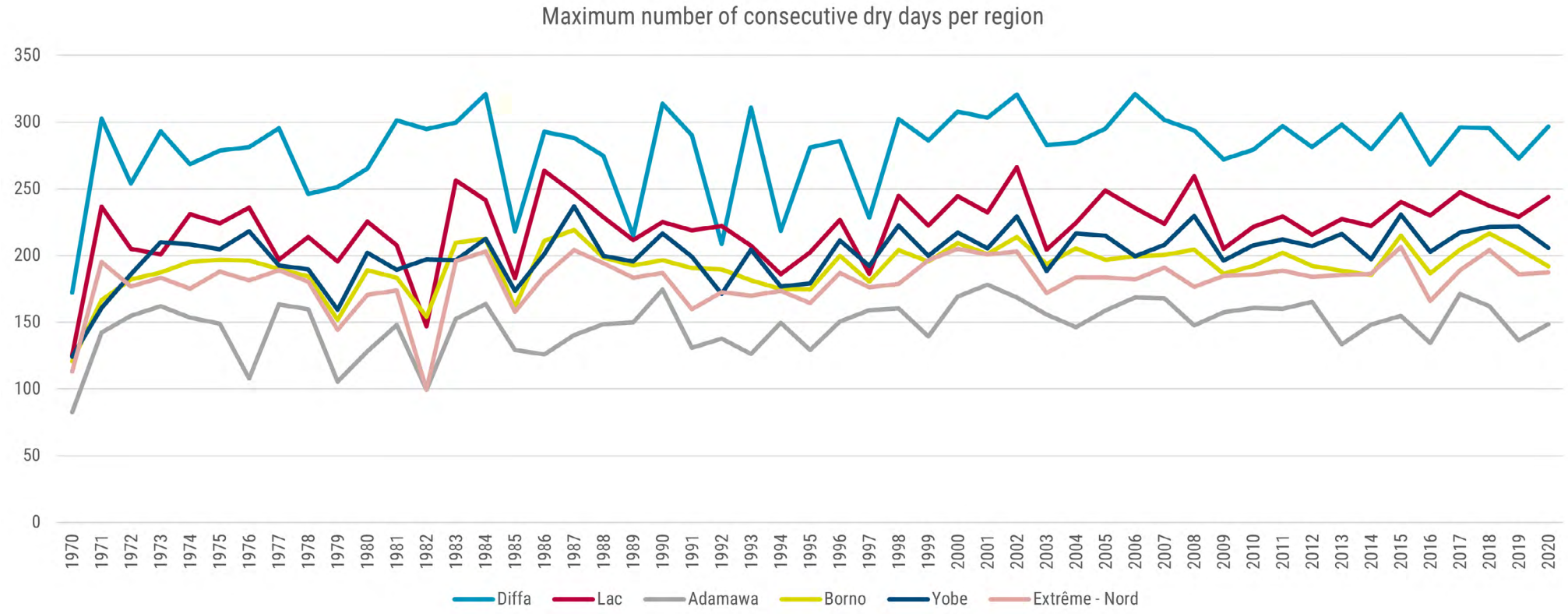
Drought

Recurrent rainfall deficits affect different regions of the LCB. In Lac province, the drought causes the degradation of natural resources; the decline in agricultural, pastoral, and fishery production; and the erosion of biodiversity. In Diffa region, bushfires generally occur accidentally, but the drying state of fodder and the harmattan wind favour their spread. These fires decimate pasture and flora, depriving cattle of essential vegetation for consumption. In northeastern Nigeria, drought manifests through the shrinking of the lake and the disappearance of fertile soils. In 2021, agricultural yields also significantly dropped in Far North region in Cameroon, particularly because of the prolonged drought in the departments of Chari, Logone, and Mayo-Sava (OCHA 09/02/2022, 15/03/2022, 14/04/2022, and 15/02/2022).

IMPACT OF EXTREME WEATHER AND CLIMATE EVENTS

Impact on livelihoods

In the LCB, the majority of the population remains rural and largely dependent on agriculture, pastoralism, and fishing. Around 90% of livelihoods are climate-sensitive. The populations of the LCB are used to shifting from one activity to another depending on the season and existing climate hazards. The recurrence of extreme weather and climate events affecting each sector of activity increasingly reduces people's adaptability (IOM et al. 23/09/2021).



Source: World Bank Climate Change Knowledge Portal accessed 20/07/2022

Fishing

An estimated 150,000 fishermen live on the shores of the lake and its islands (Owonikoko and Momodu 07/08/2020). The shrinking of the lake has caused a decrease in the number of species and the quantity of fish caught per year. Catches have decreased from 220,000 metric tons in 1974 to around 100,000 tonnes in 2011. Many species have disappeared, given high mortality rates linked to a lake that has become uninhabitable for certain species. The invasion of aquatic plants has added to the disappearance of these species, further disturbing the ecosystem. The reduction in the size of the lake has also favoured marshy species, reducing the diversity of the species present and disrupting periods of reproduction and migration for the fish (UNEP 28/02/2018; FAO 20/11/2011).

As the lake recedes, some fishermen find themselves forced to migrate to other more fertile areas to maintain their livelihoods. Many of them find themselves moving to the same fishing spots, greatly reducing the amount of fish they catch. To accommodate the drop in production, some local fishermen adopt destructive fishing methods. One method uses narrow channels to create bottlenecks to catch all the fish moving from the rivers to the ponds during the rainy season. Other fishermen use narrow mesh nets, preventing the free movement of fish and risking juvenile captures. These practices contribute to the weakening of the ecosystem and affect fish resources in terms of the variation in species and quantities caught (FAO 20/11/2011; IOM 25/08/2021; Kitoto 12/01/2016).

Agricultural activities

The drop in rainfall has considerably disrupted agricultural activities, reducing the viability of livelihoods of people living on the shores of the lake. Although people are used to migrating to more fertile areas when the lake recedes, recurrent attacks by armed groups further limit their ability to adapt to climatic hazards. To cope with the situation, more and more farmers are using strategies that affect natural resources. For example, to access water to irrigate their crops, some use flow modification to divert water from lakes and rivers to the crop plots (OCHA 07/04/2021; Owonikoko and Momodu 07/08/2020; WFP 30/04/2016).

The increasingly frequent floods, particularly in Lac (Chad) and Far North (Cameroon), often destroy hectares of crops. Aside from leading to the loss of people's means of subsistence, these extreme climatic events also displace thousands of additional people every year. The reduction in agricultural production limits the access of displaced people and host communities to food, forcing some to adopt crisis adaptation strategies, including survival sex and joining armed groups and community militias (UN 28/08/2020; FEWS NET 08/2021; Le Monde 08/12/2020; Adelphi 15/05/2019).

Pastoralism

The drying up of pastures and crucial water points hampers the practice of pastoralism by threatening the survival of livestock. Successive droughts in the 1970s caused many pastoralists to change the type of livestock they were raising, from grazing animals like cattle, camels to browsing animals such as sheep, and goats (Owonikoko and Momodu 07/08/2020).

Similar to farmers, pastoralists are advancing to the areas once occupied by the lake, where the land proves to be quite fertile. Pastoralists and their animals are typically found closer to populated areas, increasing pressure on available and fertile land. The activity of armed groups also reducing access to fertile land further increases competition over the use of available resources (Owonikoko and Momodu 07/08/2020; Kitoto 12/01/2016; FAO 03/2017).

Intercommunal violence

As the lake recedes, people are often forced to migrate in search of other means of subsistence or change their activity until the lake returns. Fishermen, farmers, and pastoralists find themselves moving to the same areas near the lake, often leading to intercommunal violence. Violence often opposes people practising different subsistence activities (IOM et al. 23/09/2021; UNHCR 17/12/2021).

In 2021, Cameroon recorded the deadliest event of intercommunal violence in its history, inseparable from the strategies that people pursuing different livelihoods had put in place to guarantee access to natural resources. Relations between the fishing and pastoral communities had deteriorated as the rains diminished on the Logone-Birni Floodplain, drying up seasonal rivers and ponds that both communities depended on for their livelihoods. Small incidents of intercommunal violence would often start with a quarrel between two people that would then degenerate into clashes between communities (IFRC 22/12/2021; ISS 04/10/2021). Large-scale conflict between Arab Choa pastoralists and Musgum fishermen erupted in August 2021, leading to the displacement of 11,000 Cameroonians to Chad. At least 19 villages were burnt and 40 others abandoned by their inhabitants. The conflict killed at least 45 people and injured 74 others (UNHCR 09/09/2021).

Clashes resumed in December 2021 between Musgum fishermen and Arab Choa pastoralists in Far North region in Cameroon, forcing an estimated 85,000 people to flee to neighbouring Chad and at least 15,000 people across Cameroon. This confrontation killed at least 44 people and injured 111. A total of 112 villages were burnt as at 17 December 2021. What triggered this conflict was the digging of vast holes by the fishermen to hold water and fish. With pastoralists also concentrated in the same area in search of water, these holes became deadly traps for their animals, with some suffering broken legs or drowning (UNHCR 10/11/2021 and 17/12/2021; IFRC 22/12/2021).

In Diffa and Lac, the straying of livestock into the fields is the source of most conflicts between pastoralists, agropastoralists, and farmers. Pastoralists, who tend to settle in areas located near water points, have been modifying transhumance corridors to adapt to climatic hazards. On the other hand, the lack of usable land is pushing farmers to occupy areas flanking cross-border transhumance routes to cultivate off-season crops. The clashing dynamics considerably increases the risk of conflict (Daiba et al. 31/05/2021; FAO 2021; OCHA 06/08/2021).

Impact on food security

Aside from insecurity, the increasing threat from climate-related hazards, such as floods and prolonged droughts, is the main source of food insecurity in the LCB (OCHA 14/04/2022 and 15/02/2022; UNHCR 17/12/2021).

Declining agropastoral production

In parts of the Sahel region of Africa including the LCB, where droughts are increasingly intense, agricultural yields are expected to fall by 20% per decade by the end of the 21st century, while temperatures are rising 1.5 times faster than in the rest of the world. Climate change can also worsen land degradation, including through the increased intensity of rainfall, flooding, the rising frequency and severity of droughts, heat stress, dry spells, and wind (IPCC 01/2020; SI 16/03/2020).

In Diffa, the delay in the rainy season, dry spells, and the early end of the rains in 2021 caused a cereal deficit estimated at nearly 870,000 metric tons – a drop of more than 1.5 million tonnes in production compared to 2020. A fodder deficit also further reduced access to livestock feed (WFP et al. 11/04/2022). These climatic conditions and security constraints caused the most significant drop in gross production per capita (160 kg/capita) in 20 years during the 2021 agricultural campaign, particularly affecting Diffa, where 24% of the population was food insecure (OCHA 03/03/2022).

In Lac province, the drying up of surface water and the scarcity of pastures have had negative consequences on the livelihoods of pastoralists and agropastoralists. The unavailability of fodder has led to the early descent of transhumant animals, epizootics, the concentration of animals in unusual areas, increased livestock mortality, and a drop in agricultural production (OCHA 15/03/2022).

In Far North in Cameroon, reduced rainfall has led to a drop in agricultural and livestock production particularly in Logone and Chari. The intercommunal violence in December 2021 also worsened the situation, with people looting localities where many households had already lost productive assets (OCHA 14/04/2022).

In northeastern Nigeria, drying soils, the destruction of shelters by floods, and rising temperatures have aggravated food insecurity. According to the projections of Cadre Harmonisé for the 2022 lean season (June–August) across Nigeria, the vast majority of people experiencing Emergency (IPC Phase 4) and Catastrophe (IPC Phase 5) food insecurity levels will be in Adamawa, Borno, and Yobe states (OCHA 09/02/2022).

Rising prices and dependence on humanitarian aid

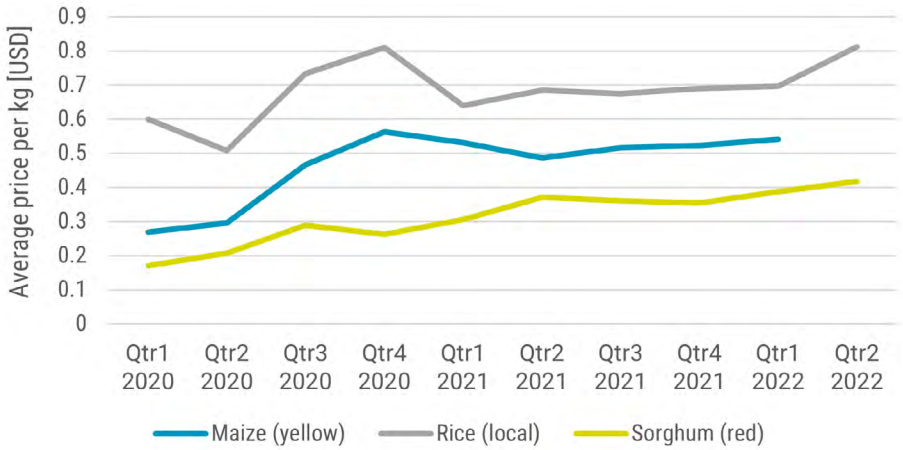
In Diffa and Lac, the rise in cereal prices directly affects households' ability to access and purchase food, by transition affecting their food consumption. Forecasts also predict these prices to increase further in 2022, particularly because of the drought. The impact is particularly severe on poor agricultural households, whose own production is insufficient, and poor urban households that depend on market purchases. Many of these households depend on humanitarian assistance to cover, at least in part, their basic food needs (OCHA 03/03/2022 and 15/03/2022).

In Cameroon, reduced rainfall during the 2021 rainy season (June–September) led to drought and reduced agricultural production. Seed-eating birds also destroyed a considerable amount of off-season crops in December. In Far North, the high prices of cereals and other basic foods further complicate food access for poor households, particularly those affected by the conflict in Chari, Logone, Mayo-Sava, and Mayo-Tsanaga. Poor harvests force these people to change their eating habits by turning from rice and millet to sorghum and maize (OCHA 14/04/2022).

In northeastern Nigeria, deteriorating food consumption patterns resulting from the recurrence of floods and prolonged droughts are contributing to worsening food security and nutritional status. Access to water and basic food is becoming more and more difficult in the LCB. The March 2022 Cadre Harmonise analysis shows serious consumption deficits in the region. Around 42.1% of households in Adamawa, Borno, and Yobe states had insufficient food intake, higher than the 37.8% from the same period in 2021 (OCHA 09/02/2022, 08/04/2022, and 18/08/2021; UNICEF 23/08/2021).

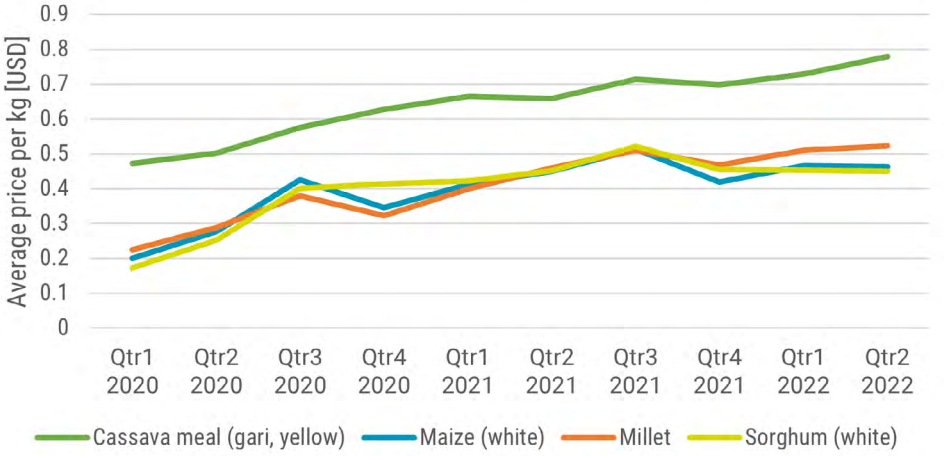
TRENDS IN PRIMARY FOOD STAPLE PRICES SINCE 2020

Cameroon: average prices per quarter (Far North Region)



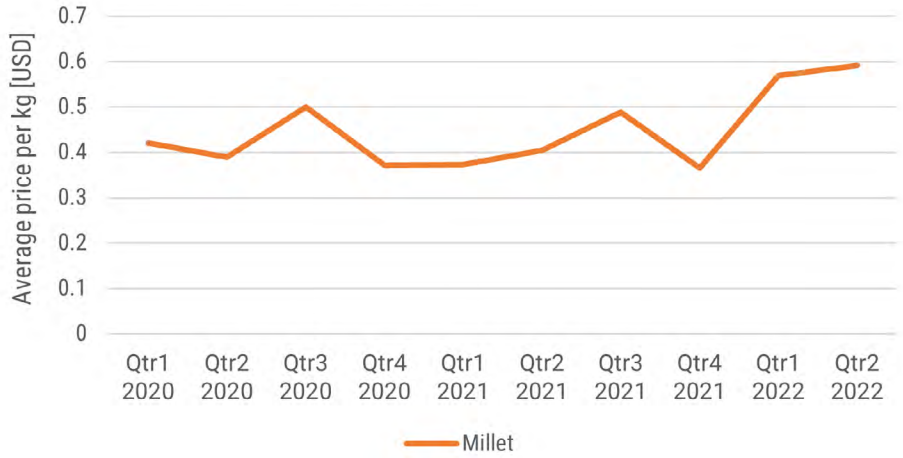
WFP 29/07/2022[4]

Nigeria: average prices per quarter (North-East)



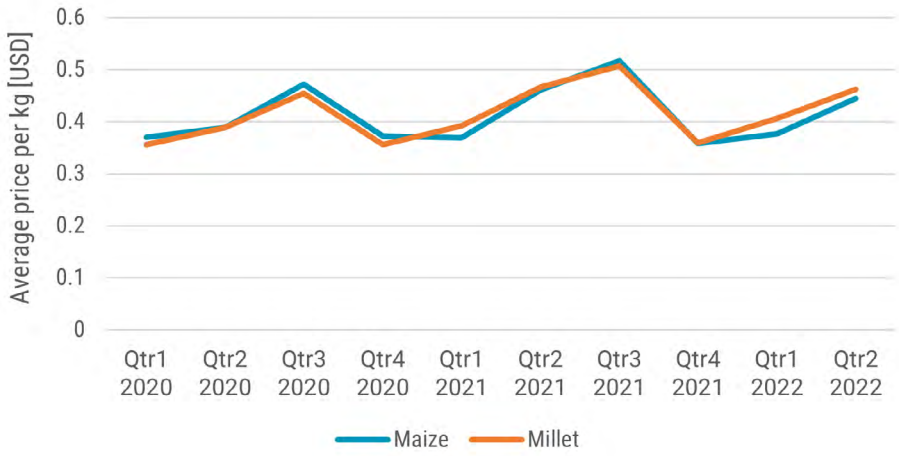
WFP 29/07/2022[6]

Chad: average prices per quarter (Lac province)



WFP 29/07/2022[5]

Niger: average prices per quarter (Diffa)



WFP 29/07/2022

[4] Millet is not included as data for the period 2020-2022 is incomplete.
[5] Maize, rice and sorghum are not included as data for the period 2020-2022 is incomplete.
[6] Millet is not included as data for the period 2020-2022 is incomplete.

OUTLOOK

Climate predictions vary from one country to another across the LCB. High natural variability contributes to making shorter-term predictions (i.e. year to year) uncertain in the region, although an increase in temperature and a greater frequency of extreme climatic events are expected to aggravate the humanitarian situation across the basin. In West and Central Africa, an increase in average wind speed, heavy rainfall, pluvial floods, and river floods are projected for the middle of the 21st century (IPCC 09/08/2021).

Chad

Precipitation predictions are highly uncertain because of high natural variability from year to year and the large uncertainty and differences between models. Some models predict little or no change in rainfall accumulations in the south of the country but anticipate a sharp decrease in the Sahelian zone and the southern part of the Saharan zone by 2030, 2050, and 2100 (UNDP et al. 06/2012). In contrast, another more recent analysis predicts an increase of 32mm in average annual rainfall by 2080 compared to 2000 (GIZ et al. 01/2021).

Climate predictions indicate a significant increase in surface temperatures relative to the 1981–2010 period. The average temperature in Chad should increase by an average of 1° C for the optimistic scenario, particularly in the northern part of the Sahel region and the entire Saharan zone. The expected increases in the Saharan zone are, on average, around 1.2° C by 2030, 2.2° C in 2050, and 4.1° C in 2100 (Gov't of Chad 10/2021; GIZ et al. 01/2021).

These changes will particularly affect the agriculture sector through significant reductions in yields and production. Water deficits from successive droughts, high temperatures, and the late onset or early cessation of the rainy season would lead to a 10–25% reduction in food crops (millet, sorghum, and maize) (CDN 10/2021).

Niger

An increase in the annual average temperature by 2060 is projected in several regions of Niger, including Diffa. The average increase in temperature in this region is likely to vary between 1–2° C by 2040, possibly resulting in decreased livestock productivity and increased mortality (WFP 11/04/2021).

An increase in precipitation during the rainy season is predicted for the 2021–2040 and 2041–2061 periods. The maximum number of days of waterlogging per month is projected to increase from one to three in certain areas, increasing the risk of flooding (WFP 11/04/2021).

Cameroon

In Far North region, climate predictions indicate a temperature increase of 0.7° C by 2025. By 2100, other non-cumulative increases are expected: 1.2° C in 2035, 2.5° C in 2055, 3.6° C in 2075, and 4.8° C in 2100 (CDN 09/2021). These increases are considered the most direct effect of global warming. A relative increase in precipitation is projected in Far North, although there is not enough information on its magnitude (WB 06/2017).

In Far North, which is particularly exposed to drought, desertification, and flooding, global warming will lead to reduced crop yields, decreased livestock productivity, and water shortages. Extreme weather and climate events, such as droughts and floods, are expected to be more frequent, with negative impacts on human health and life (CDN 09/2021).

Nigeria

Temperatures in Nigeria are expected to rise by a total of 2.9–5.7° C by the end of the century. Overnight temperatures are expected to rise by 4.7°C. The northeast of the country is one of the areas where the temperature increase will be the fastest (World Bank 2021).

Extreme rainfall and weather events likely to lead to flooding are expected to increase, affecting rivers and causing surface runoffs during the summer rainy season. Natural disasters resulting from the increased frequency and intensity of floods and droughts are also expected to increase (WB 2021).

INFORMATION GAPS AND NEEDS

- Information on the impact of extreme weather and climate events on different occupational groups is often outdated. More recent assessments would make it possible to better understand the impact of climate change in the LCB.
- Even though various reports often mention displacements and migrations caused by extreme weather and climate events, it is still difficult to establish figures concerning the people affected in the LCB. Most of the information available concerns occasional floods and does not necessarily provide updates on the evolution of a situation after a natural disaster.
- The role of population increase in resource scarcity is highly contested within the scientific community. More studies on this subject would help to know how much to attribute to each factor perceived as contributing to the scarcity of natural resources.
- Climate forecasts, especially about precipitation, have a fairly high level of uncertainty. The diversity of the models used, which sometimes lead to opposite conclusions, also makes it difficult to read future trends.

LAKE CHAD BASIN SEASONAL CALENDAR

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
Niger				Land preparation		Weeding and planting						
	Off-season flood-recession harvest				Off-season rice harvest	Rainy season				Main harvest		
								Agricultural lean season				
			Pastoral lean season									
Chad	Off-season harvest								Main harvest			
			Land preparation			Planting					Off-season land preparation	
				Pastoral lean season		Agricultural lean season						
					Rainy season							
Cameroon	Off-season harvest					Main season cultivation		Main harvest				
						Rainy season						
				Pastoral lean season		Agricultural lean season						
North Nigeria		Land preparation			Planting	Weeding						
				Off-season harvest					Harvest			
					Rainy season							

Sources: FEWS NET 03/08/2022; 03/08/2022; 03/08/2022; 03/08/2022