

The Shrinking of Lake Chad and Its Implications for Food Security in Borno State, Nigeria.

Babangida Umar Nasir¹, Mohammed Bello Baban'umma²
& Ruth Caleb³

^{1,2&3} Department of Political Science Nasarawa State University, Keffi-Nigeria
Umarnasir2004@yahoo.com; **mohammedbello@nsuk.ed.ng.**
ruthcaleb@nsuk.edu.ng
DOI: <https://doi.org/10.70118/AMR-0901-2025-19>

Abstract

The dramatic reduction in the size of Lake Chad, which was once one of Africa's largest lakes, poses significant food security challenges across the region, particularly in Borno state. This drastic reduction has led to severe food insecurity, making the LCR a hotspot for extreme humanitarian crises. Therefore, this study examines the implications of the Lake Chad basin shrinking on food security in Borno state. To achieve this, the paper uses Integrated Environmental Livelihood theory as a theoretical framework and employs a mixed -methods approach, combining quantitative and qualitative methods, to provide a comprehensive understanding of the shrinking Lake Chad region. The findings revealed the deleterious economic impact of Lake Chad's shrinking—particularly market instability and rising food prices—as the most urgent concern, with over half of responses highlighting these as significant threats to food security and local livelihoods. To address the urgent and long-term challenges posed by the shrinking of Lake Chad, a balanced strategy of immediate humanitarian aid and long-term economic stabilization is essential. Short-term actions should focus on providing food, healthcare, and emergency support to alleviate acute needs, while long-term initiatives should promote sustainable agriculture, climate-smart practices, and alternative income sources. Strengthening regional cooperation and international partnerships is crucial to build resilient market systems and water management infrastructure, reducing resource-based conflicts and ensuring sustainable development. Financial aid and technical support from global entities will be vital for the success of these efforts in stabilizing the region and mitigating further instability.

Keywords: Lake Chad, Agriculture, Food Security, Climate Change, Terrorism, shrinking.

Introduction

The dramatic reduction in the size of Lake Chad, which was once one of Africa's largest lakes, poses significant human security challenges across the region,

particularly in Nigeria. Since the 1960s, Lake Chad has shrunk from over 25,000 square kilometers to about 1,350 square kilometers, primarily due to climatic variability, unsustainable water management, and rising resource demands (Adeniran, 2020). This environmental degradation disrupts ecosystems, reducing biodiversity and fish stocks while accelerating desertification (Yamba & Visser, 2018). Such changes threaten local livelihoods, especially for communities relying on fishing, agriculture, and pastoralism.

The lake's contraction also has substantial economic repercussions. Declining water levels undermine agriculture and fisheries, critical sources of income and food security for millions, increasing poverty and economic inequalities (Niel, Leduc, & Dieulin, 2005). Resource scarcity intensifies competition, creating conflicts that erode social cohesion and further destabilize communities (Oladipo & Adeleye, 2019). Socially, the loss of arable land and livelihood opportunities has spurred migration and internal displacement, increasing pressures on host areas, fostering informal settlements, and heightening health risks due to declining water quality and sanitation (CNA Corporation, 2007).

Politically, resource competition exacerbates tensions within and between communities, posing challenges for governance structures. Weak resource management and corruption hinder effective responses to these complex socio-environmental issues, threatening regional stability (Ghazali, 2015). As climate change accelerates, the lake's shrinking is increasingly linked to broader security concerns, potentially facilitating extremist ideologies and conflicts, as seen with Boko Haram's influence in the region (Obayelu & Ayodele, 2023).

Statement of the Problem

The shrinking of Lake Chad poses a complex threat to human security in Nigeria, deepening existing vulnerabilities and creating new crises across multiple sectors. Once the sixth-largest lake globally, Lake Chad has dramatically reduced in size due to climate change, population growth, and poor water management. This environmental decline has major socioeconomic impacts, particularly in northeastern Nigeria, where millions rely on the lake for fishing, farming, and herding. As the lake recedes, livelihoods disappear, food insecurity rises, and poverty deepens, affecting over 30 million people across the basin (Rahman, 2020).

The scarcity of water exacerbates competition for resources, leading to frequent conflicts and destabilizing the social fabric of affected communities (Mustapha, 2019). Health issues are also a critical concern, as reduced water availability and quality have led to a surge in waterborne diseases like cholera and malaria, especially impacting young children (Oladipo et al., 2021). The environmental strain from the lake's shrinking has further triggered displacement and migration, as people seek better conditions, placing additional stress on urban

centers and amplifying social challenges (UNDP, 2020). Addressing these interconnected issues demands comprehensive solutions that combine environmental preservation, sustainable development, and conflict mitigation.

Objective of the Study

- i. To investigate the implications of the shrinking Lake Chad Basin on food security in Borno State.
- ii. To examine the efforts undertaken by relevant authorities to address the implication of the shrinking Lake Chad Basin on food security in Borno State.

Conceptual Framework

Food Security

Food security is a multi-dimensional concept encompassing various facets such as agricultural production, trade, income, food quality, clean water, hygiene, and governance, all of which influence an individual's or nation's food security status. The concept gained prominence during the 1996 World Food Summit in Rome, where a consensus definition was established: food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and preferences for an active and healthy life (World Food Summit, 1996, cited in FAO, 2006).

This definition highlights the crucial role of climate regulation by forests in maintaining food security. Deforestation increases the vulnerability of food production to climatic factors like low precipitation, droughts, and desertification, leading to food insecurity characterized by crop failure, low agricultural outputs, food scarcity, and high food costs. The World Food Summit definition of food security incorporates four dimensions: availability, accessibility, utilization, and stability (Saint, 2019). The interaction among these dimensions is complex and their absence can lead to food insecurity, a "wicked problem" that is ill-defined, ambiguous, and resistant to solutions (Candel, 2014). Food insecurity can manifest in various forms, including material poverty, malnutrition (both obesity and undernourishment), and socio-cultural losses, such as the loss of indigenous crop varieties and traditional ecological knowledge (Farrell et al., 2017; Hendriks, 2015).

Food security, therefore, is defined as the ability of all people at all times to access adequate nutrition, safe, and culturally appropriate foods, and ensure that food producers earn a decent living wage (FAO, 2021). The three major pillars of food security are food accessibility, availability, and affordability. In Africa, affordability is crucial for food access, which depends on both food cost and disposable income (Hassan-Wassef, 2012). The 1996 World Food Summit

definition was reaffirmed and amended in the 2009 declaration, emphasizing physical, social, and economic access to sufficient, safe, and nutritious food (CFS, 2012).

Food and nutrition security, a term increasingly used, integrates nutrition into food security policies (CFS, 2012). Food security is built on four pillars: food availability, access, utilization, and stability (CFS, 2012; UN-HLTF, 2011). Food availability involves having consistent food supplies, food access entails having sufficient resources for a nutritious diet, food use requires knowledge of basic nutrition and care, and stability encompasses consistent availability, access, and utilization.

FAO estimates that 842 million people globally, or 12% of the world's population, were chronically hungry in 2011-2013, primarily in developing regions where undernourishment was 14.3% (FAO, IFAD, and WFP, 2013). This figure represents a 17% reduction since 1990-1992, indicating progress but also highlighting ongoing challenges (FAO, IFAD, and WFP, 2013).

Shrinking of Lake Chad

Lake Chad, once one of Africa's largest lakes, has been significantly shrinking, leading to serious ecological and socioeconomic repercussions. The reduction in the lake's surface area over recent decades is attributed to both natural variability and human activities such as irrigation, damming, and deforestation (Sehoppa, 2019). These factors have led to ecological degradation, loss of biodiversity, and socioeconomic challenges for the millions reliant on the lake for their livelihoods (Boko et al., 2019).

The shrinking of Lake Chad is intertwined with broader issues of environmental degradation, resource scarcity, and conflict. As the lake recedes, competition for dwindling water resources intensifies, potentially escalating conflicts and causing displacements (Urama & Ozor, 2017; Smith, 2020). This situation exemplifies a complex environmental crisis with extensive implications for both local communities and the broader region, necessitating interdisciplinary research and sustainable management interventions to mitigate its adverse effects and build resilience (Urama & Ozor, 2017).

Historically, Lake Chad covered approximately 25,000 square kilometers in the 1960s but has now reduced to around 1,350 square kilometers with an average depth of 1-5 meters (Conflict and Insurgency in Lake Chad - Interview with Mohammed Bila). The lake's water volume, estimated at 72.5 cubic kilometers in September 2022, fluctuates due to seasonal and annual changes, largely influenced by decreased inflow from the Chari River and other tributaries.

Lakes globally hold over 90% of Earth's freshwater resources and provide critical ecosystem services, including hydrological buffering, habitats, recreational spaces, and freshwater fisheries (Rast, 2014). They support basic ecological processes and contribute to the well-being of surrounding communities. However, lakes are increasingly threatened by human activities such as damming, dumping, and draining, as well as natural causes (Schuyt, 2005).

Hydrological fluctuations in lakes reduce agricultural opportunities and impact the well-being of human populations within and outside their basins. Mismanagement and unsustainable use of lake resources can lead to significant societal concerns. Despite the multifunctionality of lakes and their growing importance in environmental research, awareness of the degradation of many lakes remains limited.

In summary, the shrinkage of Lake Chad illustrates a multifaceted environmental crisis with severe consequences, highlighting the urgent need for comprehensive research and sustainable management practices to address and mitigate these challenges (Sehoppa, 2019; Boko et al., 2019; Urama & Ozor, 2017; Smith, 2020).

Empirical Review of Related Literature

Implications of the Shrinking Lake Chad Basin on Food Security

The shrinking of the Lake Chad Basin has increasingly critical implications for food security in the region, impacting millions who rely on the basin's resources for their livelihoods. Once one of Africa's largest freshwater lakes, Lake Chad has shrunk by over 90% since the 1960s, primarily due to climate change, unsustainable water usage, and population pressures (Ovie & Emma, 2020). This reduction has led to severe food insecurity, particularly for communities dependent on fishing, agriculture, and pastoralism, as the declining water levels reduce access to essential resources.

Agricultural productivity in the Lake Chad region has been notably affected by the lake's reduction. As the water recedes, fertile lands that once supported crop cultivation dry up, reducing agricultural yields and forcing farmers to rely on less productive land (Rahman, 2021). This environmental degradation has not only led to lower crop production but has also made it more difficult to sustain livestock, as pasturelands become scarce. According to recent studies, farmers and herders in Nigeria's Borno State, for example, have reported significant losses in food production, intensifying poverty and hunger in these communities (Mustapha, 2019).

The fishery sector, another cornerstone of food security in the Lake Chad Basin, is also suffering greatly. Fish stocks have declined sharply as water levels have decreased, leading to reduced catches and affecting the livelihoods of those who depend on fishing. This has resulted in both economic strain and decreased protein availability for local populations, a critical issue in a region already vulnerable to malnutrition (Béné et al., 2019). Studies have found that the depletion of fisheries has a cascading effect on food prices, further exacerbating food insecurity for communities that already struggle with limited resources (Ngatcha & Goni, 2020).

Resource scarcity in the Lake Chad Basin has also intensified competition over dwindling water and arable land, often leading to conflict among communities and further disrupting food security. Conflicts between farmers, herders, and fishing communities are increasingly common, as groups struggle to access limited resources, reducing agricultural productivity and contributing to displacement (Okpara et al., 2021). Displacement from such conflicts compounds food insecurity, as it forces people from their land and limits their access to reliable food sources.

In response to these challenges, some initiatives have been implemented, but significant gaps remain. For example, while regional projects under the Lake Chad Basin Commission aim to address water management and support resilience, studies indicate that local communities need more targeted interventions to restore agriculture and fisheries to sustainable levels (Yusuf & Hassan, 2022). International organizations have highlighted the need for comprehensive measures that address both environmental management and food production to improve food security outcomes in the region (UNDP, 2020).

The implications of Lake Chad's shrinking on food security underscore the need for urgent, multifaceted approaches. Empirical evidence suggests that without increased focus on sustainable resource management, climate adaptation, and conflict resolution, food insecurity in the Lake Chad Basin is likely to worsen in coming years (Gao & Mills, 2021). Addressing these issues is critical to supporting the livelihoods of millions in the region and preventing further deterioration in food security and social stability

Efforts to mitigate the implication of the shrinking Lake Chad Basin on food security

The Lake Chad Development and Climate Resilience Action Plan: This initiative, coordinated by the Lake Chad Basin Commission (LCBC) and supported by the African Development Bank, aims to promote sustainable water management and restore the lake's ecosystem. The plan emphasizes infrastructure improvements, such as irrigation systems, and seeks to enhance agricultural productivity through resilient practices. Research by Yusuf and

Hassan (2022) suggests that these initiatives have had a positive impact on food security by helping local farmers adapt to climate variability, though the reach of these efforts remains limited, and further investment is needed to scale up these interventions effectively.

Reforestation and Ecosystem Restoration Projects: Recognizing the role of environmental degradation in food insecurity, the Nigerian government, in collaboration with the UN Environment Programme (UNEP), has launched reforestation initiatives aimed at combating desertification and restoring vegetation around Lake Chad. These projects are intended to reduce soil erosion, improve water retention, and provide more arable land for agriculture. According to Ovie and Emma (2020), these restoration efforts have shown promise in slowing desertification, but their impact on food security is limited without parallel investments in water infrastructure

Improvement of Water Infrastructure: To address water scarcity directly, the Nigerian government has undertaken projects to rehabilitate and construct dams and irrigation systems that draw from the remaining water sources in the Lake Chad region. This effort aims to provide a more reliable water supply for agricultural activities, which are vital for food security. Rahman (2021) reports that new irrigation systems have improved crop yields in areas with access to them, though lack of maintenance and financial resources remain challenges for long-term sustainability.

Conflict Resolution Initiatives: The LCBC, alongside local authorities, has implemented conflict resolution programs to address tensions between farmers, herders, and fishing communities competing for limited resources. These initiatives include community dialogue sessions and resource-sharing agreements aimed at preventing conflicts that disrupt food production. Studies by Okpara et al. (2021) have shown that such interventions have helped reduce incidences of resource-based conflicts in the region, indirectly supporting food security by creating a more stable environment for agricultural activities.

International Funding and Climate Adaptation Programs: International organizations, including the World Bank and the United Nations Development Programme (UNDP), have provided financial and technical assistance to enhance the region's resilience to climate impacts. Projects under the UNDP's climate adaptation framework focus on promoting drought-resistant crops, water-efficient agricultural practices, and training local farmers. Gao and Mills (2021) found that these programs have increased agricultural resilience and improved food security outcomes, particularly for smallholder farmers, although limited access to such programs remains a significant barrier for many.

The Transaqua Project Proposal: One ambitious and controversial proposal, the Transaqua Project, seeks to replenish Lake Chad by diverting water from the

Congo River Basin. Although it has not been fully implemented, the project aims to stabilize water levels in the lake, thereby supporting agriculture and fishing activities. While some studies argue that this large-scale intervention could revive local economies and alleviate food insecurity, environmental concerns and the project's financial feasibility remain contentious (Ngatcha & Goni, 2020).

Theoretical Framework.

Integrated Environmental Livelihood Framework

The Integrated Environmental Livelihood Framework (IELF) provides a comprehensive approach to understanding the impacts of Lake Chad's shrinkage on food security in Borno State by integrating environmental determinism, livelihoods, and political ecology perspectives. Environmental determinism highlights how physical changes, such as the depletion of water and fertile land in the Lake Chad Basin, directly impact the resources available for agriculture and livestock, which are essential to the food security of local communities (Batterbury, 2001; Odada, Oyebande, & Oguntola, 2006). As these resources become scarce, the immediate availability of food is threatened, affecting the stability and productivity of subsistence activities crucial to these communities.

The livelihoods framework focuses on the vulnerability and adaptive capacity of these communities, emphasizing that natural resources, social networks, financial assets, and physical infrastructure are all necessary for maintaining food security (Ellis, 2000). As Lake Chad's resources decline, households in Borno face increased vulnerability due to limited alternative income sources and low adaptive capacity, making them more susceptible to food insecurity. This dependency on diminishing resources limits their resilience, as subsistence activities are insufficient to withstand the environmental and economic pressures (Kangalawe & Lyimo, 2013). Without diversified livelihoods, these communities lack the economic flexibility to adapt, further compounding food insecurity issues in the region.

Political ecology adds a critical perspective, examining how regional conflict, weak governance, and ineffective resource management impact food security by intensifying competition for dwindling resources (Robbins, 2004). In Borno, political instability and inadequate transboundary water management hinder effective responses to the food security crisis (Okpara, Stringer, & Dougill, 2016). The IELF thus argues that environmental degradation, low adaptive capacity, and governance challenges collectively deepen food insecurity in Borno, indicating that policies must address all three dimensions to create

resilient food systems for affected communities (Magrin & Pérouse de Montclos, 2018)

Methodology

This research employs a survey research design to examine the impact of the shrinking Lake Chad region on food security in Borno State, northeastern Nigeria. A mixed-methods approach, combining quantitative and qualitative methods, is used to provide a comprehensive understanding. Quantitative methods involve analyzing data from questionnaires to explain changes in the lake's size and volume and their implications on Nigeria's human security. Qualitative methods include focused group discussions with local communities, experts, and stakeholders (Adelekan et al., 2023).

The study population includes 2636 individuals from various farmers' associations in Borno State and 1003 staff from the Lake Chad Basin Commission (LCBC). Purposive sampling identifies relevant participants, while cluster and simple random sampling are used for questionnaire distribution to ensure diverse perspectives on the lake's shrinkage. A 10% sample size of each population segment is selected, totaling 1709 respondents (Black & Champion, 1976).

Data collection methods include questionnaires and key informant interviews (KII). The questionnaire, a 5-point Likert scale, assesses the impact of Lake Chad's shrinkage on food security, with questions derived from the research objectives. Interviews supplement the data, involving sessions with crop farmers, fish farmers, cattle breeders, and LCBC staff.

Secondary data are sourced from journals, news articles, and the LCBC database, focusing on climate change and conflicts in the Lake Chad region. Data analysis uses descriptive and inferential statistics through SPSS for quantitative data, while qualitative data undergo content analysis to identify thematic insights and draw conclusions (George & Mallery, 2001)

Data Analysis

Table 1.1 Respondents Responses on the Implication of the Shrinking of Lake Chad on Food Security

Options	Frequency	Percentage
Reduced Water Availability for Agriculture	43	11.48%
Loss of Fishing Resources	40	10.69%
Displacement of Communities	25	6.68%
Increased Poverty	65	17.37%
Food Price Inflation	99	26.47%
Market Instability:	102	27.21%
Total	374	100

Field Survey,2024

The most significant concerns among respondents regarding the shrinking of Lake Chad are market instability and food price inflation, which together account for over half of the responses (53.68%). This indicates that respondents perceive the lake's shrinkage as a major disruptor of food supply chains, driving up food prices and making food more difficult to access. The interconnectedness of food production and distribution means that rising prices and market volatility are viewed as immediate threats to food security, as they affect not only the availability but also the affordability of food. Additionally, increased poverty (17.37%) is highlighted as a key outcome, with communities that rely on agriculture and fishing for their livelihoods suffering economic losses, which deepens their vulnerability to food insecurity.

While reduced water availability for agriculture (11.48%) and loss of fishing resources (10.69%) are also significant concerns, they are seen as secondary to the economic impacts. These issues directly affect food production, but respondents prioritize economic disruptions like market instability and food price inflation as the more urgent threats to food security. Displacement of communities (6.68%) is a relatively less prominent concern, likely viewed as a longer-term consequence of resource depletion rather than an immediate factor in food access. Overall, the data underscores that respondents are most worried about the broader economic effects of the lake's shrinking, particularly how these disruptions impact access to food and exacerbate poverty in the region.

On the other hand, the interview conducted with Fisherman from Lake Chad Region from a village along the shores of Lake Chad narrated that

Depletion of Fishing Resources: The respondent highlights the dramatic decline in fish catches due to the shrinking lake, which has significantly reduced the community's primary source of food and income. Fishing once provided a stable livelihood, but now many fish species are either scarce or completely gone. The fisherman explains that the reduction in fishing has caused widespread economic hardship. Families are struggling to access food, and many are unable to afford market prices for fish and other essentials. This has led to increased poverty in the community, with many people relying on aid to survive. With the lake receding, many fishing villages have been forced to relocate, causing displacement and further strain on already limited resources. This has led to overcrowded areas where people compete for food, water, and shelter, worsening the overall food security situation. "The lake used to be our life—fishing was everything. Now, we barely catch enough to eat, and even if we can, the prices have gone up. There are too many people coming here looking for food because their own villages are disappearing. We need help, but we also need the lake to come back."

Interview Result 2: Farmer from Chad's basin in Borno lamented that

The farmer describes how the shrinking lake has led to a reduction in water availability for both drinking and agricultural use. Farmers who once relied on the lake's waters for irrigation are now facing crop failures as the water level drops. This has resulted in a loss of harvests, which has a direct impact on food availability. **Livelihood Losses and Increased Poverty:** The respondent explains that many farmers in the region are now unable to plant their usual crops due to water scarcity. As a result, they have experienced reduced income and are finding it harder to purchase food. The combination of failed crops and increased competition for limited resources is pushing many families deeper into poverty. **Dependence on Aid and Migration:** In some cases, farmers have been forced to depend on humanitarian aid, which is insufficient to meet all their needs. Others are migrating to urban centers or other areas in search of work or better access to food. However, these migrations often lead to overcrowding and increased competition for jobs and resources. Quote: "The water is almost gone, and without it, we cannot farm. I have seen neighbors leave for the cities, hoping to find work, but it is difficult for anyone to find anything. The food we can afford is getting scarcer every day."

Interview Result 3: NGO Worker in the Lake Chad Basin

Impact on Regional Stability: The NGO worker discusses how the shrinking of Lake Chad is exacerbating food insecurity across multiple countries, including Chad, Nigeria, Cameroon, and Niger. As communities suffer from declining

fish stocks and agricultural yields, the region is seeing increased competition for resources. This, in turn, is contributing to social tensions and instability, with clashes over water and land use becoming more frequent. Increase in Food Prices and Market Instability: The worker points out that the shrinking lake is not only affecting local food production but also disrupting the regional economy. As resources become scarcer, food prices have risen dramatically, putting basic staples out of reach for many. Market instability is a major concern, as local economies that depend on agriculture and fishing are increasingly fragile. Displacement and Migration: The NGO worker highlights the mass displacement of people from shrinking coastal areas of Lake Chad. The movement of displaced populations to urban areas and other countries has strained local infrastructure and led to higher levels of food insecurity in these regions. In some cases, food aid is insufficient to meet the needs of the growing displaced population. “The shrinking of the lake is creating a domino effect across the region. People are losing their livelihoods and are being forced to move in search of food and water. This migration is putting more strain on already fragile cities, where food prices are skyrocketing. Without coordinated intervention, we are looking at a worsening humanitarian crisis.”

Table 1.2 Respondents responses on the most effective measure to address the implication of lake chad shrinking for food security

Options	Frequency	Percentage
Integrated Water Resource Management (IWRM)	47	12.57%
Sustainable Agricultural Practices	56	14.97%
Promotion of Alternative Livelihoods	66	17.65%
Humanitarian and Development Assistance	78	20.87%
Improved Fisheries Management	34	9.09%
Building Resilience to Climate Change	19	5.08%
International Cooperation and Funding	74	19.79%
Total	374	100

Respondents overwhelmingly support humanitarian and development assistance (20.87%) and international cooperation and funding (19.79%) as the most effective measures to address the shrinking of Lake Chad. Together, these measures account for over 40% of the responses, indicating a strong belief in the necessity of both immediate relief and long-term external support.

Humanitarian aid is seen as crucial for alleviating immediate food insecurity, while international funding is viewed as essential for implementing sustainable solutions such as infrastructure development and capacity building in the region. Additionally, promotion of alternative livelihoods (17.65%) is also a significant response, reflecting the need to diversify income sources away from the over-exploited agricultural and fishing sectors, with activities like small-scale livestock farming and eco-tourism helping buffer the economic impacts of environmental changes.

Other notable measures include sustainable agricultural practices (14.97%), which are seen as vital for ensuring long-term food security through climate-smart agriculture, efficient irrigation, and soil conservation. Integrated Water Resource Management (IWRM) (12.57%) is also recognized, though less frequently mentioned, as a strategy to ensure equitable and sustainable access to water for agricultural and non-agricultural needs. Improved fisheries management (9.09%) is considered important but secondary to broader livelihood and agricultural strategies. Finally, building resilience to climate change (5.08%) ranks the lowest, likely due to the perception that immediate solutions addressing food security and economic resilience are more urgent than long-term climate adaptation efforts. Overall, respondents prioritize both immediate support and adaptable, community-focused strategies to address the challenges posed by the shrinking lake.

Interview Result 1: Local Community Leader in a fishing village along Borno

The respondent emphasizes the urgent need for humanitarian aid to address immediate food shortages caused by the shrinking lake, which has depleted fish stocks and reduced agricultural productivity. They highlight the importance of promoting alternative livelihoods, such as small-scale farming, livestock rearing, and eco-tourism, to reduce dependence on fishing. Additionally, the respondent calls for increased international support from governments and NGOs to help build community resilience through infrastructure development, including water harvesting systems, irrigation, and improved access to markets for alternative income sources.

Quote: “We need food now, and humanitarian assistance is crucial. But we also need to think long-term. We can’t rely on fishing forever. It’s important that we help people transition to new ways of earning a living. Without external help, we can’t survive the long-term effects of this crisis.”

Interview Result 2: Government Official in Borno

Respondent: Government official from Borno state Ministry of Environment and Water Resources.

Integrated Water Resource Management (IWRM): The respondent focuses on the critical role of Integrated Water Resource Management (IWRM) in ensuring sustainable water use across the region. They highlight the importance of coordinating water use between agricultural, domestic, and environmental needs to maximize the benefits of the dwindling resources in the lake. **Sustainable Agricultural Practices:** The official also discusses the need for scaling up sustainable agricultural practices such as climate-smart agriculture, which includes the use of drought-resistant crops, efficient irrigation systems, and better land management practices to adapt to the changing environment. **Collaboration with International Partners:** They mention that international funding and technical expertise are crucial to implementing these solutions effectively. They see IWRM and sustainable agriculture as key components of a broader strategy to address food security in the long term, alongside immediate relief efforts.

Quote: “We need to manage our water resources carefully, ensuring they benefit both people and ecosystems. Sustainable agriculture will also play a huge role in ensuring food security. But we cannot do this alone—we need international cooperation and funding to make it happen.”

Interview Result 3: NGO Worker (Food Security Expert) focusing on food security and climate change in the Lake Chad Basin.

The NGO worker stresses the critical importance of international cooperation and funding to address the root causes of food insecurity driven by the shrinking Lake Chad. They emphasize the need for both immediate humanitarian assistance, such as food aid, and long-term investments in infrastructure and agricultural development to support affected communities. The worker also highlights the importance of building resilience to climate change, noting that adapting to shifting rainfall patterns and rising temperatures is crucial for ensuring the success of sustainable agricultural practices and the survival of local populations in the long run.

Quote: “In the short term, humanitarian aid is a lifeline for food security. But for the long run, we need both local and international efforts to help communities adapt to climate change and develop more resilient agricultural systems. Without cooperation and funding, these efforts will fall short.”

Discussion of Findings:

- i. The most significant concern among respondents regarding the shrinking of Lake Chad is its economic impact, particularly market instability and food price inflation, which together account for over half (53.68%) of the responses. Respondents perceive the shrinking lake as a major disruptor of food supply chains, leading to rising food

prices and market volatility. These economic disruptions, which affect the availability and affordability of food, are viewed as immediate threats to food security, especially for communities that rely on agriculture and fishing for their livelihoods. The increase in food prices and the instability of local markets have exacerbated poverty, with many households unable to afford basic necessities. This perception underscores that food insecurity in the region is not only a matter of availability but also of access.

- ii. Respondents overwhelmingly support humanitarian and development assistance (20.87%) and international cooperation and funding (19.79%) as the most effective measures to address the shrinking of Lake Chad. Together, these measures account for over 40% of the responses, reflecting a strong consensus that both immediate relief and long-term external support are essential. Humanitarian aid is crucial for alleviating food insecurity in the short term, while international funding is seen as necessary for implementing sustainable solutions like infrastructure development, water resource management, and capacity-building initiatives. The prioritization of these measures underscores the urgency of addressing immediate needs while ensuring long-term resilience and stability in the region.

Recommendations:

- i. Given the dominance of economic concerns, it is recommended that both short-term humanitarian aid and long-term economic stabilization strategies be prioritized. Immediate interventions should focus on providing food aid to alleviate the acute food insecurity resulting from the shrinking lake. At the same time, longer-term solutions should aim to diversify livelihoods through sustainable agricultural practices, support for alternative income-generating activities, and the establishment of robust market systems that can withstand environmental shocks. Additionally, regional cooperation should be strengthened to address market instability and ensure equitable access to resources, such as water, in a way that reduces conflicts and supports sustainable development. International support, including financial aid and technical assistance, will be crucial for both the immediate and long-term success of these initiatives.
- ii. Given the strong emphasis on both immediate aid and long-term external support, it is recommended that international cooperation and multilateral partnerships be strengthened to ensure a balanced response to the crisis. Immediate humanitarian relief should continue, providing food aid, healthcare, and emergency support to

vulnerable communities. At the same time, long-term investments should focus on building infrastructure for sustainable water resource management, promoting climate-smart agricultural practices, and diversifying livelihoods. Enhanced collaboration between national governments, international organizations, NGOs, and local communities is critical to developing integrated solutions that address both the immediate food insecurity and the underlying causes of vulnerability, ensuring that Lake Chad's shrinking does not continue to deepen regional instability.

References

- Adams, S. M., & Jean, P. (2019). Land cover change in the Lake Chad Basin: an assessment of 1990-2014 using machine learning algorithms. *Remote Sensing*, 11(9), 1088.
- Adano, W. R., Dietrich, S., & Witsenburg, K. M. (2019). Trapped in fragmentation? The shifting geography of the pastoral economy in North-eastern Kenya. *Pastoralism*, 9(1), 16.
- Adewole, O. (2023). Sustainable livelihood strategies in conflict-affected environments: A case study of the Lake Chad Region. *Journal of Environmental Management*, 45(3), 321-335.
- Ahmed, M., Jones, B., & Smith, K. (2019). "Ecological Consequences of Lake Chad Shrinkage: Implications for Livelihoods." *Environmental Science & Policy*, 90, 102-110.
- Baechler, G. (Ed.) (1999). Environmental Degradation in the South as a Cause of Armed Conflict, In *Environmental change and security: A European perspective*, *World Development*, 60:14 - 30.
- Banks, J. (1998). The lives and values of researchers: Implications for educating citizens in a Multicultural Society. *Educational Researcher*, 27(7): 4 - 17.
- Barnett, J. (2001). *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era*. Zed Books.
- Booth, K. (2007). *Theory of World Security*. Cambridge: Cambridge University Press.
- Burke, M., Hsiang, S. & Miguel, E. (2015). Climate and Conflict. *Annual Review of Economics*, 7:577 - 617.

- Hunters, L. & Twine, W. (2008). Rural household demographics, livelihoods, and the environment. *Global Environmental Change*, 18(1): 38 - 53.
- Deligiannis, T. (2012). The evolution of environment-conflict research: Towards a livelihood framework. *Global Environmental Politics*, 12(1): 78 - 100.
- Detraz, N. (2011). Threats or vulnerabilities? Assessing the link between climate change and Security. *Global Environmental Politics*, 11(3) 104 - 120.
- Elfversson, E. (2015). Providing security or protecting interests? Government interventions in violent communal conflicts in Africa. *Journal of Peace Research*, 52(6) 791- 805.
- Ellis, F. & Freeman, H. (2004). Rural Livelihoods and Poverty Reduction Strategies in Four African Countries. *Journal of Development Studies*, 40(4)1- 3 0.
- Enloe, C. (2000). *Maneuvers: The International Politics of Militarizing Women Lives*. Berkeley: University of California Press.
- Eriksen, S. & Kelly, P. (2006). Developing credible vulnerability indicators for climate adaptation policy assessment: Mitigation and Adaptation Strategies for Global Change, *Journal of Agricultural Economics*. 12(4): 495 - 524.
- FAO (2012). Climate change implications for fishing communities in the Lake Chad Basin. In *Food and Agriculture Organization Fisheries and Aquaculture Proceedings*, 25. Rome, 84.
- Fisher, M., Reimer, J. & Carr, F. (2010). Who should be interviewed in surveys of household income? *World Development*, 38(7) 966 - 973.
- Fjelde, H. (2015). Farming or fighting? Agricultural price shocks and civil war in Africa. *World Development*, 67: 525 - 534.
- Gill, P., Stewart, K., Treasure, E. & Chadwick, B. (2008). Methods of Data Collection in Qualitative Research: Interviews and focus groups. *British Dental Journal*, 204(6): 291- 295.
- GIWA (Ed.) (2004) *Lake Chad Basin: Regional assessment 43*, Sweden: University of Kalmar.

- Gray, L. & Moseley, W. (2005). A Geographical Perspective on Poverty-Environment Interactions. *Geographical Journal*, 171(1): 9 - 23.
- Halden, P. (2011). The past, present, and future(s) of environmental security studies. *Cooperation and Conflict*, 46: 406 - 414.
- Homer-Dixon, T. F. (1994). Environmental Scarcities and Violent Conflict: Evidence from Cases. *International Security*, 19(1), 5 - 40.
- Hsiang, S., Meng, K. & Cane, M. (2011). Civil Conflicts Are Associated with the Global Climate. *Nature*, 476(7361):438–441
- Olaniyan, A. M., Berrang-Ford, L., Srinivasan, R., & Namanya, D. B. (2020). Climate change and risk of violence: a case study of Boko Haram in Nigeria. *Climatic Change*, 161(3), 523-541.
- LCBC (2014). The Lake Chad Basin. <http://www.cbilt.org/enllake-chad-basin>
- LCBC (2015). The Lake Chad Basin Commission: Mandate and missions. <http://www.cbilt.org/en/mandate-and-missions>.
- LCBC (2016). Project highlight for the Lake Chad Basin. <http://www.cbilt.org/en/projects>.
- Le Dillon, P. (2001). The Political Ecology of War: Natural Resources and Armed Conflicts. *Political Geography*, 20(5), 561 - 584.
- Matthew, R. A. (1997). Environmental Change and International Relations: Some Theoretical Explorations. *Journal of Peace Research*, 34(3), 277 - 296.
- Mustapha, A.R. (2019). Environmental Challenges, Security, and Conflict in Africa. *African Journal of Political Science and International Relations*, 13(8), 234-242.
- Oladipo, O.O., Ajibade, I.F., Adeniji, A. O., Akanbi, I.O., Ogundipe, J.A., & Aransanmi, I. A. (2021). Impact of Climate Change on Lake Chad and Its Indigenous People. *American Journal of Environmental Sciences*, 17(1), 15- 23.
- Rahman, M. (2022). Water Conflict and Human Security: A Case Study of Lake Chad Basin. *Security Dialogue*, 53(3), 232-248.
- Smith, 3. A. (2017). “Socio-economic Impacts of Lake Chad Shrinkage: A Case Study of Yobe and Borno States.” *Journal of Development*

Studies, 45(3), 421-438. Intersection. Marine Corp University Press.

UNDP. (2020). Human Development Report 2020: The Next Frontier - Human Development and the Anthropocene. United Nations Development Programme.

United Nations Development Programme. (1994). Human Development Report. New York: Oxford University Press.

Yamba, F.D. & Visser, M., (2018). The shrinking Lake Chad: a geopolitical and ecological time bomb. African Geographical Review, 37(3), 301-314.