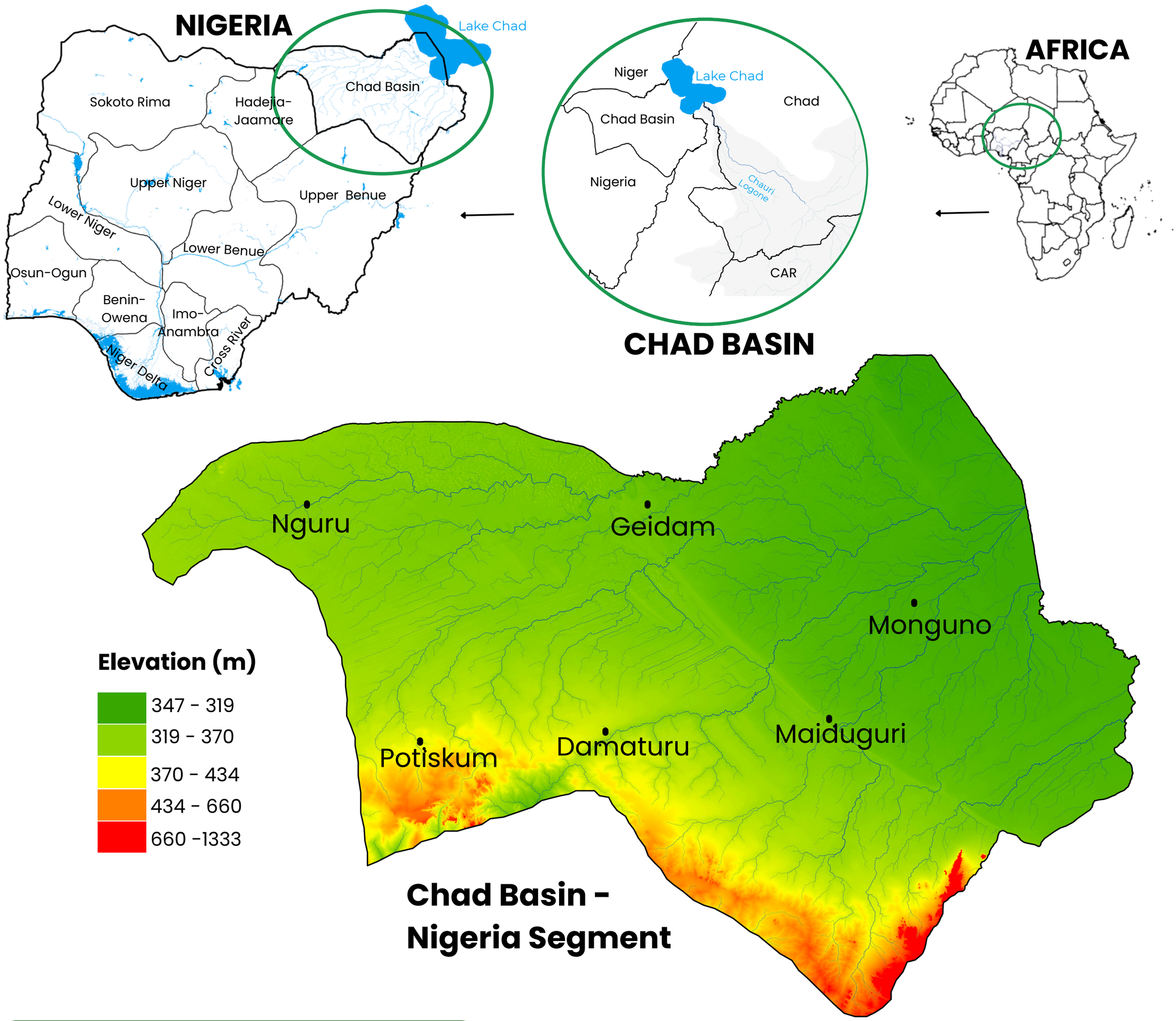
# Lifelines at Risk: Nigeria's River Basins and the Triple Planetary Crisis

## Spotlight: Chad River Basin




## CHAD BASIN AT A GLANCE

### Geography and Scale

The Chad basin is located in the North-Eastern corner of Nigeria, primarily within Borno and Yobe. It covers about **179,282 km²** or roughly **19%** of Nigeria's total area.

### Drainage Systems

The Basin is **endorheic**, meaning it has no outlet to the sea. The major rivers within the Nigerian sector are the **Yobe River** and the **Ngadda River**. They are shallow and only provide a minor contribution to Lake Chad; over **90%** of the lake's water volume comes from the **Chari-Logone** system in the Central African Republic via Logone River in Cameroon.

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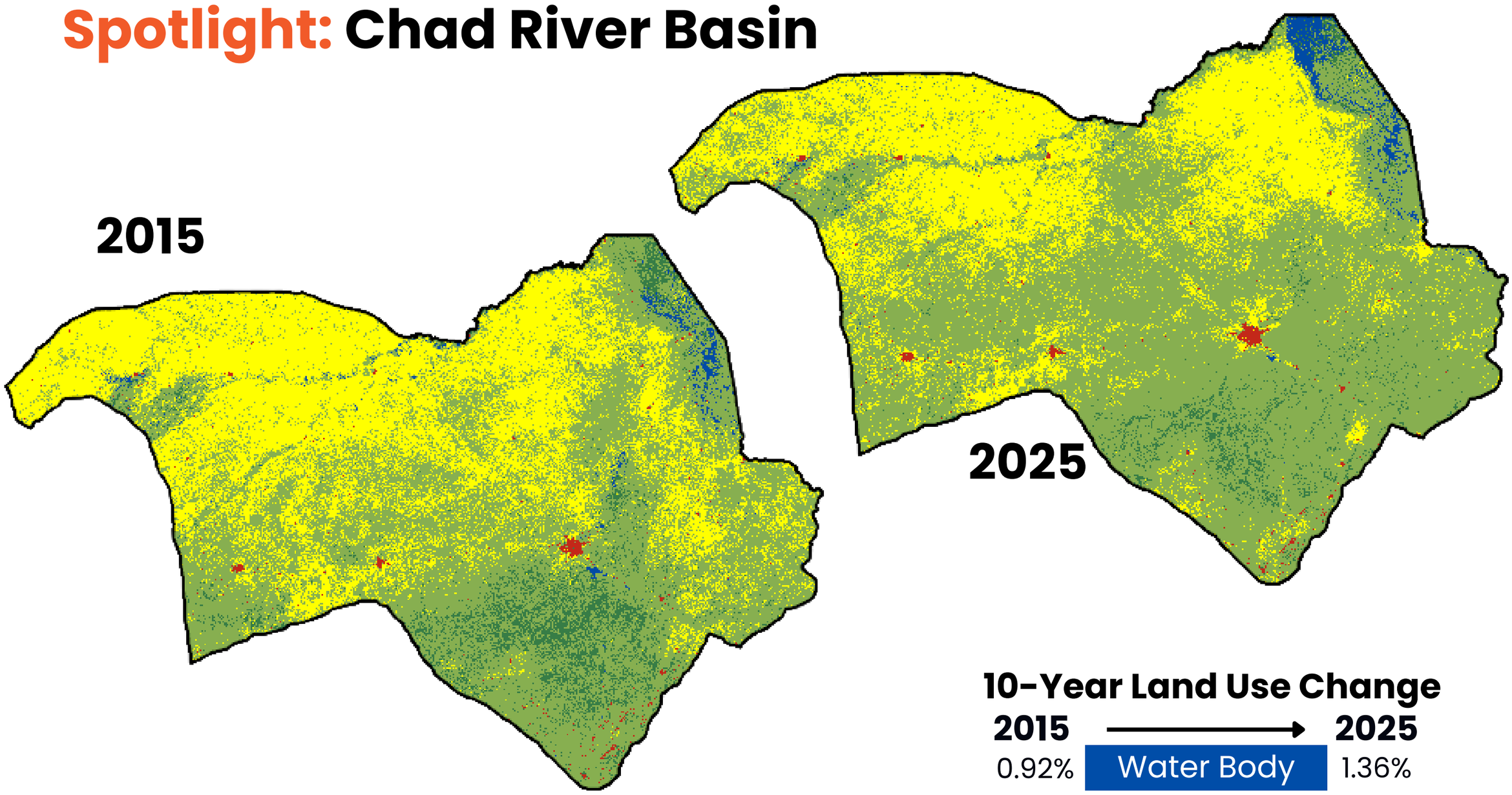
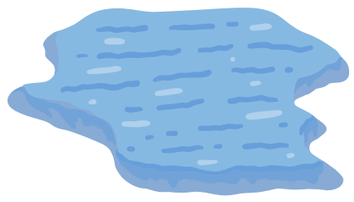



*Despite a more stable lake in recent years, the basin still suffers from the effects of desertification, groundwater depletion, groundwater salinity and loss of vegetation*

### 10-Year Land Use Change

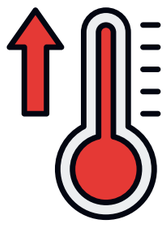
| 2015 | | 2025 |
|---|---|---|
| 0.92% | Water Body | 1.36% |
| 5.77% | Forest | 2.58% |
| 0.51% | Urbanization | 0.53% |
| 42.28% | Bare land | 32.89% |
| 50.53% | Cultivated land | 60.64% |

## DRIVERS OF ENVIRONMENTAL TRANSFORMATION



**Water Bodies**
**+0.44% Gain**

The increase in water bodies across the basin, particularly in southern Lake Chad, is not indicative of stable water recovery. Instead, it reflects a pattern of extreme rainfall and destructive flash floods as has been recorded in Potiskum, Gujba, and Bade LGAs since 2022. These floodwaters often cause mass displacement, infrastructure damage, and contamination of wells, worsening public health crises such as cholera.



**Rising Temperatures (up to 1.5 times the global average)**

The rate of evapotranspiration (water loss) has increased over the years, pulling moisture from the soil with consequences on agriculture.

**Urban Water Stress**

Maiduguri's expanding population has caused a negative trend in water levels and soil moisture. This depletion is attributed to sustained pumping (over extraction) in the densely populated areas of the city,

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### Drivers of Environmental Transformation

**Urbanization**
**+0.02% Gain**

Urban expansion in Maiduguri and Damaturu, driven by years of **forced migration** and **humanitarian interventions,** has led to a steady sprawl of informal housing, internally displaced person (IDP) settlements, and peri-urban infrastructure. The growth is concentrated in **Jere, Konduga, and the outskirts of Damaturu,** often lacking planned drainage and sanitation systems. The built-up footprint reflects more than population growth; it is a marker of survival, adaptation, and strain on fragile city systems.

**Bare Land**
**-9.39% Loss**

While bare land has decreased overall, this trend is concentrated in localized re-vegetation efforts, particularly in **southern Yobe** and **southeastern Borno,** where greening initiatives like tree-planting under the Great Green Wall have taken root. Simultaneously, the infilling of exposed ground by farmland and temporary floodwaters has altered land surface reflectivity, masking deeper land degradation beneath seasonal vegetation cover.

**Cultivated Land**
**+12.11% Gain**

In most areas of the Chad Basin, rising food insecurity and population displacement due to conflict have intensified the conversion of fallow land, wetlands, and shrublands into croplands. Expansion of smallholder and survival agriculture, particularly in safer zones around **Maiduguri** and **southern Yobe**, is often at the expense of natural vegetation. Humanitarian interventions and farming incentives have also encouraged aggressive land clearing for staple crops like millet, maize, and sorghum to support IDPs'.

**Forest**
**-3.18% Loss**

Across Borno and Yobe, forest and tree cover loss is being driven by urban encroachment, fuelwood harvesting, and insecurity-induced displacement. In areas surrounding **Damaturu, Geidam, and Mafa,** intensified logging for household energy needs and the collapse of land governance structures due to conflict have accelerated the degradation of forest patches. This has direct implications on microclimate regulation, and biodiversity.

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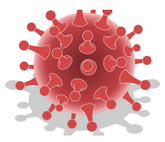
**Public Health Emergency**

### Fluorosis and Chemical Contamination

Groundwater from the Chad Formation aquifer in areas around Maiduguri has been found to have elevated concentrations of fluoride. Excessive fluoride intake leads to dental fluorosis in children and, in severe cases, skeletal fluorosis (weakening of the bones and joints)



### Cholera Crisis

The 2022 floods contaminated wells and displaced hundreds of thousands of people into overcrowded camps with poor sanitation leading to the 2022 Cholera Outbreak. Borno state alone accounted for over **86%** of the combined **14,353** cases and **318** deaths reported in Borno and Yobe

### Malnutrition Crisis

In the Lake Chad Basin, households already facing livelihood pressures from environmental and economic shocks are also affected by insecurity and displacement. In Borno, Adamawa, and Yobe, recent reports suggest that these overlapping pressures would contribute to a rising risk of severe acute malnutrition (SAM) among children in the year 2026.

### Zoonotic & Vaccine-Derived Risks

The shrinking of Lake Chad and the loss of natural habitats force wildlife and livestock into closer proximity with displaced humans, increasing the transmission of pathogens (viruses/bacteria) from animals to humans. Low routine immunization in "security compromised" biodiversity hotspots (like the Sambisa fringes in Borno/Yobe) has allowed cVDPV2 (Polio) to persist in unreached populations.

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## Call to Action

### CLIMATE RESILIENT INFRASTRUCTURE

Invest in climate-resilient infrastructure via climate financing for nature-based solutions.

### EMPOWER COMMUNITIES

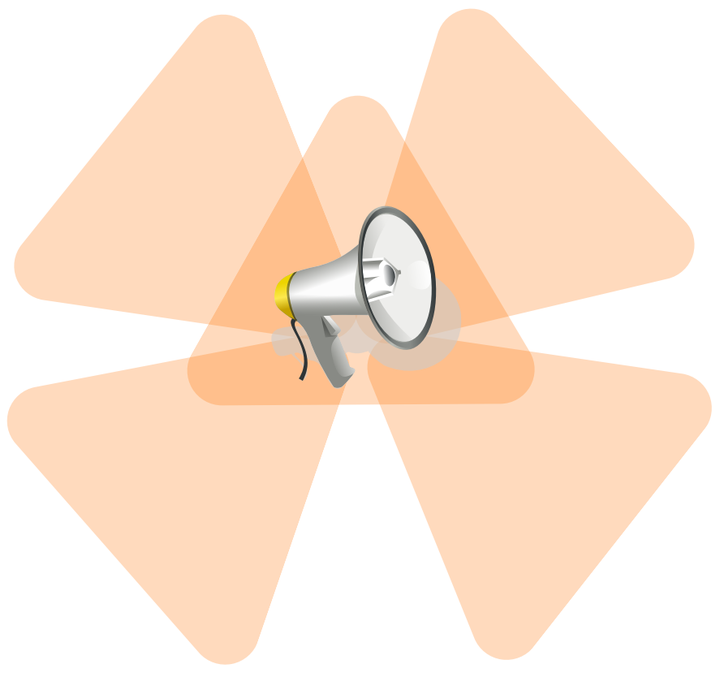
Empower local communities with climate education, early warning systems to foster climate-smart agricultural practices

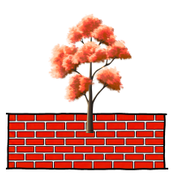
### STRENGTHEN PUBLIC HEALTH

Strengthen public health systems to withstand climate shocks and disease outbreaks.

### FOSTER COLLABORATION

Foster cross-sectoral and functional collaborations between the government, and other relevant stakeholders to ensure a whole-system coordination.





### SUSTAINABLE LAND RESTORATION

Support decentralized, community-led land restoration efforts and agro-ecological practices that leverage local knowledge to sustainably reverse desertification.