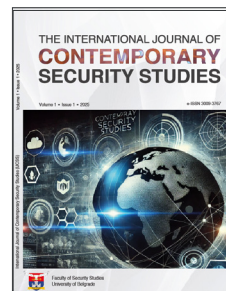




Faculty of Security Studies, University of Belgrade
**International Journal of Contemporary
Security Studies (IJCSS)**



Article

Fueling the Insurgency: Climate-Resource Scarcity and the Persistence of Terrorism in Northern Nigeria

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Received: 15 September 2025; Revised: 28 October 2025; Accepted: 30 November 2025; Published: 30 December 2025.

ABSTRACT

This study examines the causal pathways through which climate change and resource scarcity sustain terrorism in Nigeria's Sahelian-Lake Chad region. Employing a mixed-method design that integrates panel data (2000-2023) with content analysis of field reports and policy documents, it investigates the interconnections between environmental degradation, livelihood collapse, and violent extremism in Borno, Yobe, Katsina, and Zamfara States. Findings reveal that rising temperatures and declining rainfall aggravate competition over land and water, which, when mediated by governance failures, deepens human insecurity and creates operational opportunities for groups like Boko Haram and ISWAP. The evidence supports an integrated Human and Environmental Security framework, demonstrating that ecological stress erodes state legitimacy and fosters terrorist resilience. The paper concludes that disrupting this cycle requires integrated strategies that synchronize climate adaptation with security governance. Policy implications are directed at security sector actors and regional bodies, highlighting the need to mainstream climate-risk analysis into counter-terrorism and bolster cross-border resource governance under the Lake Chad Basin Commission (LCBC) and ECOWAS.

KEYWORDS

Climate change; human security; resource scarcity; terrorism; sahel; lake Chad; Nigeria; security governance.

1. Introduction

The Sahelian-Lake Chad region, spanning Northern Nigeria, Niger, Chad, and Cameroon, has emerged as a global epicenter of insecurity. In Nigeria's North-East and North-West, groups such as Boko Haram and the Islamic State West Africa Province (ISWAP) have demonstrated remarkable persistence. While often framed in ideological terms, this persistence is increasingly rooted in the region's profound social and ecological fragility. Climate-induced livelihood collapse has intensified the struggle for survival, creating a fertile recruitment ground for extremist organizations (UNDP, 2023).

Rising temperatures, desertification, and erratic rainfall have systematically eroded agricultural and pastoral productivity, displacing millions. The receding of Lake Chad, which has shrunk by over 90% since the 1960s (FAO, 2022), exemplifies a broader ecological crisis, escalating competition over scarce resources and fueling



local conflicts (Raleigh et al., 2014). These dynamics are magnified by weak governance, inadequate adaptation policies, and chronic poverty.

This study reframes the persistence of terrorism within the Human Security and Resource-Conflict paradigms, arguing that climate change and resource scarcity are not merely background conditions but active drivers that exacerbate human vulnerability, weaken state legitimacy, and provide strategic opportunities for extremist groups. The guiding research question is: How do climate change and resource scarcity sustain terrorism in Nigeria's Sahelian-Lake Chad region, and what are the implications for human security and regional governance? This paper contributes to security studies by moving beyond correlational analysis to trace the specific causal mechanisms through which environmental stress is weaponized by terrorist groups. It demonstrates that governance failure is the critical intervening variable that transforms ecological crisis into protracted insecurity.

2. Theoretical Framework and Literature Review

2.1. Human Security and Environmental Security Nexus

The Human Security paradigm (UNDP, 1994) fundamentally shifts the referent object of security from the state to the individual and community. It posits that security encompasses economic, food, health, environmental, and political safety. Within this framework, environmental degradation is both a direct threat to human welfare and a multiplier of other vulnerabilities.

The Environmental Security approach (Barnett & Adger, 2007) complements this view, arguing that environmental stress acts as a threat multiplier. It contends that resource scarcity alone rarely causes conflict; rather, it triggers violence when institutional mechanisms for negotiation, adaptation, and equitable distribution are weak or absent (Buhaug, 2015; Detraz & Betsill, 2009). In the Sahelian-Lake Chad region, this interplay is evident, where environmental decline directly threatens livelihoods, pushing populations towards survivalist economies and making them vulnerable to recruitment by extremist networks (Krampe & Månsson, 2021).

2.2. Climate Stress and Resource Conflict in Nigeria's Sahelian Corridor

A robust body of empirical research confirms a significant link between climate variability and conflict. Macro-level studies establish that temperature anomalies and rainfall variability correlate with conflict frequency across Africa's drylands (Burke, Hsiang, & Miguel, 2015; Koubi, 2019). However, scholars increasingly emphasize that this relationship is not deterministic but is mediated by local political, economic, and social contexts (Ide, 2017; Salehyan, 2008).

This pattern is acutely visible in Northern Nigeria. Drought and desertification in Yobe and Borno States have displaced pastoralists southward, intensifying deadly clashes with farmers over dwindling resources (Benjaminsen, 2021; Benjaminsen & Ba, 2019). Similarly, rainfall decline in Katsina and Zamfara has deepened rural poverty, triggering widespread banditry and cross-border migration (Okpara et al., 2020; Moriconi-Ebrard et al., 2020). Here, the interplay of ecological fragility and poor governance generates a vicious climate-security feedback loop.

2.3. Governance Deficits and Terrorist Resilience

Environmental shocks expose the fragility of governance systems (Dada, Mohammed, & Quadir, 2025; Garba & Akaan, 2025; Metić, 2025; Vidović & Beriša, 2025). When local and national institutions fail to provide adaptive responses, equitable resource access, or social safety nets, their legitimacy plummets (International Crisis Group, 2023). Extremist organizations strategically fill this vacuum by offering protection, dispute resolution, and alternative livelihoods, functions traditionally expected of the state (Thurston, 2020). Thus, governance deficits are not a passive backdrop but an active mechanism that transforms ecological crises into protracted insecurity (Matthew, 2014; Selby, 2014).

2.4. Conceptual Framework

Building on the integrated Human and Environmental Security paradigms, this study employs a conceptual framework that maps the causal pathways linking climate change to the persistence of terrorism (see Figure 1). This framework posits that the relationship is not direct but is mediated by a series of critical, interlinked variables.

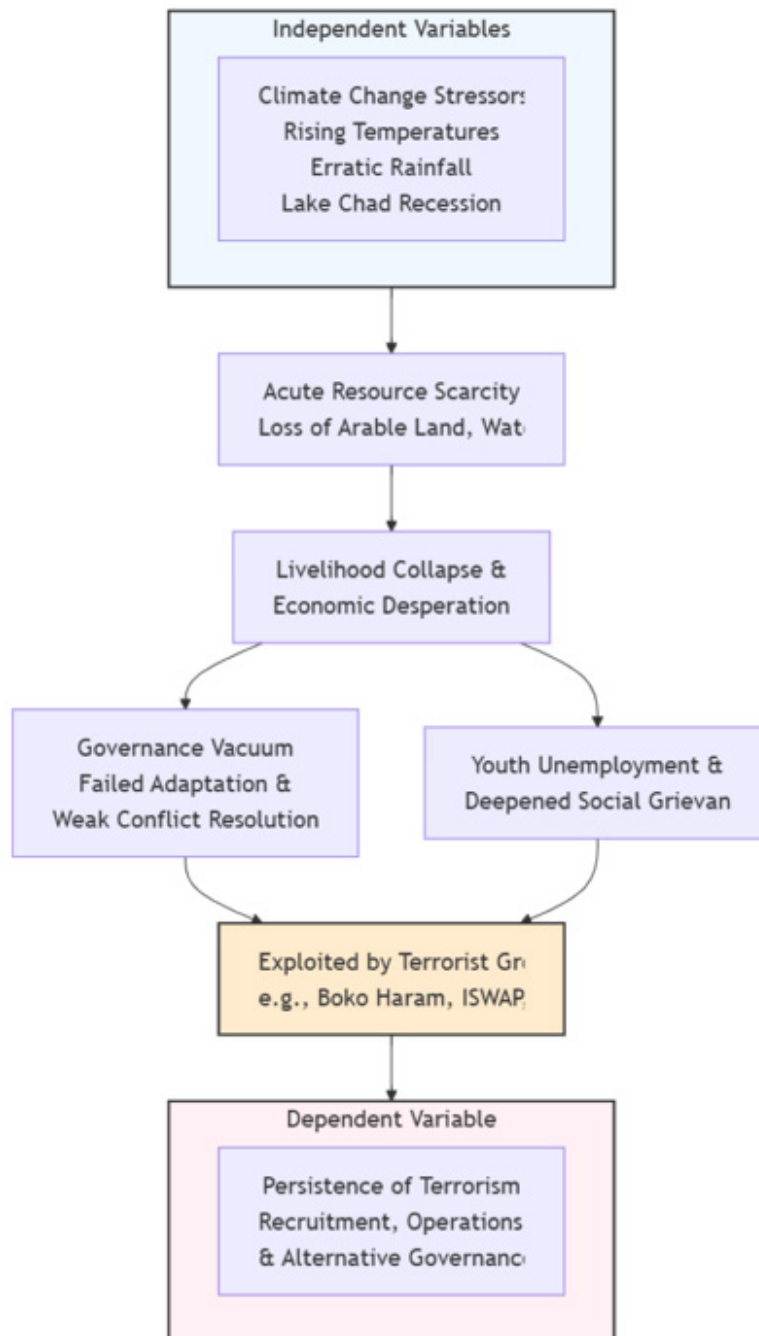


Figure 1. The Climate-Resource-Governance Nexus: A Conceptual Framework.

Note: This model illustrates the proposed causal pathways linking climate stressors to the persistence of terrorism, with governance failure as a critical intervening variable.

As illustrated in Figure 1, the model begins with Climate Change Stressors (e.g., rising temperatures, erratic rainfall) which drive Acute Resource Scarcity. This scarcity triggers Livelihood Collapse & Economic Desperation, creating two parallel crises: a Governance Vacuum from failed state adaptation and a surge in Youth Unemployment & Social Grievance. The core of the framework is the argument that these twin crises create a synergistic opportunity that is systematically exploited by terrorist groups. By offering alternative governance

and livelihoods, these groups boost their resilience, leading directly to the dependent variable: the Persistence of Terrorism.

This framework guides the entire analysis, shaping the selection of variables for quantitative testing and providing the themes for qualitative content analysis. It allows this study to move beyond establishing correlation and toward explaining the specific, governance-dependent causal mechanisms that sustain terrorism in an era of climate change.

3. Methodology

3.1. Research Design

A sequential mixed-method approach was adopted to robustly explore the climate-terrorism nexus, a methodology advocated for its ability to uncover the complex causal mechanisms that purely quantitative studies might miss (Ide, 2017). This design allows for the triangulation of statistical trends with contextual, field-based narratives.

- Quantitative Data (2000-2023): Time-series data on key variables were compiled from reputable sources (see Table 1).
- Qualitative Data: Content analysis was conducted on 45 policy documents, humanitarian assessments, and field reports from the UNDP, LCBC, ECOWAS, and Nigerian government agencies. This provided crucial insights into the on-the-ground mechanisms of livelihood collapse, governance responses, and extremist adaptation.

3.2. Data Sources and Measurement

Table 1. Summary of Variables and Data Sources

Variable	Measurement / Proxy	Data Source	Period
Terrorism Intensity	Annual number of terrorist incidents per state	Global Terrorism Database (GTD)	2000-2023
Temperature Anomaly	Annual deviation from 30-year average (°C)	World Bank Climate Portal	2000-2023
Rainfall Variability	Annual deviation from long-term mean (mm)	NASA MODIS	2000-2023
Vegetation Index (NDVI)	Annual vegetation density	NASA MODIS	2000-2023
Agricultural Output	Crop yield index (base year 2010=100)	FAOSTAT	2000-2023
Governance Quality	Government effectiveness (-2.5 to +2.5)	World Governance Indicators	2000-2023

Note. All variables standardized and log-transformed to ensure comparability.

Methodological Note: The use of the GTD, while the global standard, presents known challenges in conflict zones, including potential under-reporting of smaller-scale incidents in remote areas. Our mixed-methods approach is designed to mitigate this by using qualitative data to capture these nuanced, local dynamics (Buhaug, 2015).

3.3. Analytical Approach

- Quantitative Analysis: Panel regression models with state-fixed effects were employed to assess the relationship between environmental stress indicators (temperature, rainfall, NDVI) and terrorism intensity, while controlling for governance quality.
- Qualitative Analysis: Documents were imported into NVivo and coded thematically, focusing on three core domains derived from the theoretical framework: (1) narratives of livelihood collapse, (2) descriptions of state and non-state governance, and (3) evidence of extremist recruitment and adaptation strategies.

Ethical approval was guided by the Research Committee's non-human subjects protocol (2024/EC/045). All secondary data were anonymized and publicly available.

4. Results and Discussion

4.1. Climatic Stress and Terrorism Patterns

Regression results indicate a strong positive correlation ($r = 0.61$, $p < 0.05$) between temperature anomalies and terrorism incidents in Borno, Yobe, and Katsina. Periods of acute drought (2009-2012; 2018-2022) consistently coincided with significant spikes in attacks by Boko Haram and affiliated bandit groups. Furthermore, declining vegetation (NDVI scores) was a statistically significant predictor of higher terrorism rates. This quantitative evidence is consistent with large-N findings across Africa (Burke et al., 2015) and provides a robust foundation for the argument that environmental stress is a key variable in sustaining conflict, supporting the initial stages of the conceptual framework presented in Figure 1.

4.2. The Causal Pathway: From Scarcity to Recruitment

The qualitative data vividly illustrates the mechanisms depicted in Figure 1. Over 70% of the population in Borno and Yobe depend on rain-fed agriculture and pastoralism (UNDP, 2023). As Lake Chad recedes, fishermen and farmers are dispossessed, forcing mass migration and deepening inter-communal tensions (Moriconi-Ebrard et al., 2020). This desperation is a key recruitment tool. UNDP surveys (2023) reveal that 62% of youth in climate-stressed communities attribute their participation in armed groups to a "lack of livelihood options."

Critically, terrorist groups do not merely recruit the desperate; they actively exploit the governance vacuum created by the crisis. For instance, ISWAP has been documented providing cash, food, and basic services to communities in Borno State facing severe food insecurity, directly leveraging resource scarcity to buy loyalty and recruit members (International Crisis Group, 2023). Similarly, in Zamfara, bandit groups offer protection and a share of looted resources to youths with no viable economic alternatives, demonstrating the framework's pathway from scarcity and grievance to terrorist resilience, a pattern observed elsewhere in the Sahel (Benjaminsen, 2021).

4.3. The Centrality of Governance Failure

The results underscore that governance deficits are the critical amplifier, as theorized in our framework. Inadequate adaptation funding, corrupt resource management, and weak or absent conflict resolution mechanisms systematically reduce public trust in the state (Matthew, 2014). The failure to provide security or justice in the face of farmer-herder clashes, for example, leads communities to seek protection from armed groups. Non-state actors thus fill the governance vacuum, not only with violence but with a parallel system of order, thereby eroding the state's legitimacy and monopoly on force (Thurston, 2020). The result is a dual crisis: environmental degradation and institutional capture, where conflict dynamics become detached from their initial climatic triggers (Selby, 2014).

4.4. Integrating Climate Resilience and Security Governance

The evidence strongly suggests that purely military counter-terrorism interventions are doomed to fail if they ignore the ecological and human security roots of the conflict. Programs like the Great Green Wall and the Lake Chad Basin Stabilization Strategy are promising but remain chronically underfunded and operationally fragmented. An effective response requires a fundamental rethinking of security to include environmental and livelihood dimensions, synchronizing climate adaptation, livelihood regeneration, and community-based security governance (Mobjörk et al., 2020).

5. Conclusion and Policy Implications

This study demonstrates that the persistence of terrorism in Northern Nigeria is not merely an ideological war but a governance crisis amplified by ecological collapse. The climate-resource-terrorism nexus reveals that extremist groups are as much governance actors as they are military threats, strategically filling the voids left by failing states.

To break this cycle, policymakers must integrate climate resilience directly into the heart of security policy. The following recommendations provide a targeted agenda for national and regional actors:

Table 2. Integrated Policy Recommendations

Policy Objective	Recommended Action for Security/Sectoral Actors
Mainstream Climate-Security Links	For Security Sector: Integrate climate-risk and resource scarcity analysis into national security strategy military planning and intelligence assessments.
Strengthen Resource Governance	For State/Natural Resource Management Agencies: Implement transparent community-involved land-use reforms and water management boards to reduce conflict triggers.
Reduce Recruitment Vulnerability	For Development Agencies & State Governments: Invest massively in youth-centered livelihood programs (e.g. climate-smart agriculture vocational training) in high-risk zones.
Enhance Local Legitimacy	For All Tiers of Government: Integrate traditional institutions into climate adaptation and security planning to rebuild trust and improve local buy-in.
Foster Regional Cooperation	For LCBC & ECOWAS: Harmonize cross-border climate-security policies joint resource management and intelligence-sharing on terrorist movements.

Without this integrated approach that treats environmental governance as a core security imperative, Nigeria's Sahelian region will remain locked in a cycle of ecological stress and protracted violence.

6. Ethical Considerations and Study Limitations

This study relied on publicly available datasets and secondary reports, ensuring compliance with research ethics protocols. Its primary limitations include inherent data gaps in the GTD concerning unreported local conflicts and the reliance on proxy indicators for complex social phenomena like governance (Buhaug, 2015). Future research would benefit significantly from integrating high-resolution remote-sensing data with targeted household-level surveys to better capture the localized dynamics of climate vulnerability and recruitment, as called for in recent methodological literature (Ide, 2017).

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