KADUNA JOURNAL OF GEOGRAPHY
2026, VOL. 8, No. 1, 211-222
https://doi.org/10.47514/kjg.2026.08.01.022

Research Article

# From Displacement to Adaptation: Livelihood Dynamics and Agricultural Land Access Among Internally Displaced Persons in The Lake Chad Basin

Haruna Suna Maje[a], Mohammed Mala Daura[a], Babagana Boso[a], Usman Adamu[a], Mohammed Baba-Adamu[a]

[a] Department of Geography and Environmental Management, Yobe State University, Damaturu, Nigeria.

**ABSTRACT**

Forced displacement is one of the most pressing humanitarian and development challenges globally, particularly in conflict-affected regions such as the Lake Chad Basin. This study examined the dynamics of livelihood transformation and agricultural land access among IDPs in Yobe State, Nigeria. It focused on understanding how displacement reshaped agrarian livelihoods and adaptive strategies in host communities. It employed mixed-methods research design, multistage sampling technique and descriptive statistical analysis. The findings revealed that pre-displacement livelihoods were overwhelmingly agrarian, with crop farming (49.4%) and livestock rearing (17.3%) as the dominant. However, displacement significantly disrupted these land-dependent livelihoods, leading to a marked shift toward precarious survival activities such as petty trading (26.9%) and casual labour (23.0%). Only 14.6% of respondents remained actively engaged in farming after displacement, reflecting widespread loss of productive assets and limited access to cultivable land. Although 59.5% have land access in host communities, most arrangements were insecure, temporary or mediated through rental, borrowing or host-allocated systems. Inadequate land size, poor soil fertility, long distances to farms and persistent insecurity further constrained agricultural reintegration. Consequently, food and income security declined significantly, reinforcing economic vulnerability and dependence on humanitarian assistance. The study concluded that IDPs' livelihood restoration requires prioritization of land access, strengthened tenure security, climate-resilient agricultural support and livelihood diversification.

**ARTICLE HISTORY**
Submitted 29 February 2026
Accepted 11 April 2026
Published 18 April 2026

**GUEST EDITOR**
A. M. Ahmed

**KEYWORDS**
Internally Displaced Persons (IDPs); Livelihood Dynamics; Agricultural Land Access; Forced Displacement; Yobe State

## 1 Introduction

Forced displacement is a major challenge to human security and sustainable development, particularly in regions affected by conflict, environmental stress, and socio-political instability (Abel et al., 2019; Mach et al., 2019). The increasing scale of internal displacement, especially in fragile regions such as the Sahel and Lake Chad Basin, is driven by the interaction of insurgency, environmental degradation, and communal conflict, all of which undermine livelihood systems (Borderon et al., 2019; Morales-Muñoz et al., 2020; Kamta et al., 2020; Scheffran et al., 2019). In this context, rebuilding livelihoods among internally displaced persons (IDPs) has become a central concern in both humanitarian and development discourse (Maxwell et al., 2017). Access to agricultural land is widely recognised as a key determinant of livelihood recovery in agrarian societies, where land serves as both a productive asset and a basis for social identity (Fiske et al., 2014; Maxwell et al., 2017).

In many developing regions, rural livelihoods depend heavily on land-based activities such as crop cultivation and livestock production (Madu & Nwankwo, 2020). However, displacement disrupts these systems by severing access to farmland and productive resources. Empirical evidence shows that many displaced households lose access to their pre-displacement land due to insecurity, tenure disputes and weak institutional frameworks, forcing them into precarious and often unsustainable livelihood strategies (Maxwell et al., 2017; El Ghamari & Bartoszewicz, 2020). This pattern is particularly evident in Africa, which hosts a significant share of the global internally displaced population (Population Reference Bureau, 2020).

The Lake Chad region, covering Nigeria, Niger, Chad, and Cameroon, illustrated these dynamics, as it is characterised by prolonged insecurity, environmental degradation, and resource scarcity (Buma et al., 2018; Pham-Duc et al., 2020). The shrinking of Lake Chad, combined with climate variability and population pressure, has intensified competition over land and water resources (Mahmood et al., 2020; Zieba et al., 2017). These pressures are further compounded by climate change, which increases the frequency of droughts and resource-based conflicts (Ide et al., 2020; Okpara et al., 2018). In such contexts, agricultural land is both scarce and contested, limiting access for displaced populations and constraining their livelihood recovery. Nigeria hosts one of the largest populations of IDPs in Sub-Saharan Africa, largely due to the Boko Haram insurgency in the northeast (Gwadabe et al., 2018; Zenn, 2020). The crisis has displaced millions across Borno, Adamawa, and Yobe (BAY) States, severely disrupting agro-pastoral livelihoods (Anugwom, 2018; Kamta et al., 2020).

**Corresponding Author:** Baba-Adamu, M. m.babaadamu001@gmail.com Department of Geography and Envi. Mgmt, Yobe State University, Nigeria.

In Yobe State, widespread abandonment of farmland due to insecurity has reduced agricultural productivity and heightened vulnerability (Abbas, 2017; Akubor, 2017). At the same time, host communities face their own resource constraints, leading to increased competition over limited land resources (Madu & Nwankwo, 2020; Okpara et al., 2018). Consequently, displaced households encounter significant barriers in accessing cultivable land, undermining their economic stability and food security.

Institutional factors further complicate land access. The coexistence of statutory and customary land tenure systems creates uncertainty for displaced populations, particularly those lacking formal land rights or social networks (Arhin-Sam, 2019). As a result, many IDPs rely on informal and often insecure land-use arrangements, which provide limited opportunities for sustainable livelihood recovery. In Yobe State, these challenges are intensified by weak institutional capacity and environmental stress, resulting in a complex and fragile livelihood landscape. Existing studies have largely examined displacement, livelihood adaptation, or land access as separate issues, often relying on descriptive approaches or unidimensional analyses (Maxwell et al., 2017). However, there is limited empirical evidence that integrated agricultural land access dynamics with evolving livelihood strategies of IDPs, particularly in fragile and conflict-affected environments such as northeastern Nigeria. Moreover, the interaction among environmental stress, institutional constraints, and livelihood transitions remains insufficiently explored.

This study addressed these gaps by providing a comprehensive and integrated analysis of agricultural land access and livelihood transitions among IDPs in Yobe State. By examining how displaced households navigate land constraints and adapt their livelihood strategies amid insecurity and environmental change, the study contributes to a more nuanced understanding of resilience and recovery in fragile settings. The findings offer important insights for designing evidence-based policies and interventions that promote sustainable reintegration, equitable land access, and livelihood resilience among displaced populations.

## 2 Materials and Methods

### 2.1 Study Area

The study was conducted in Yobe State, located in northeastern Nigeria, between latitudes 10°00′N and 14°00′N and longitudes 10°00′E and 13°00′E (Figure 1). The state shares an international boundary with the Republic of Niger to the north and is bordered by Borno State to the east, Bauchi State to the west, and Gombe State to the south. Covering approximately 45,502 km², Yobe State lies in the Sudano-Sahelian ecological zone, characterized by a semi-arid climate that significantly influences agricultural production and rural livelihoods. The climate is marked by distinct wet and dry seasons, with the rainy season occurring between June and September and annual rainfall ranging from 500 to 800 mm. Rainfall variability and high temperatures, which often exceed 35°C and occasionally rise above 40°C, strongly influence farming activities and land productivity. These climatic conditions make agriculture highly vulnerable to environmental variability, particularly for displaced populations who rely largely on rain-fed farming systems (Madu & Nwankwo, 2020; Okpara et al., 2018).

The state is characterized by sandy soils in the northern zones and relatively fertile clay-loam soils in the southern areas, which support crops such as millet, sorghum, maize, and groundnut. Vegetation reflects the Sahel–savanna transition, ranging from sparse shrubs and grasses in the north to scattered savanna woodland in the south. Agriculture forms the backbone of the local economy, with most households engaged in mixed farming and livestock rearing. The state also hosts diverse ethnic groups, including Kanuri, Hausa, Fulani, Ngizim, Kare-Kare, Ngamo, and Bolewa, whose livelihoods are closely tied to land and natural resources. Consequently, access to agricultural land is central to the recovery and integration of livelihoods for internally displaced persons within host communities (Maxwell et al., 2017).

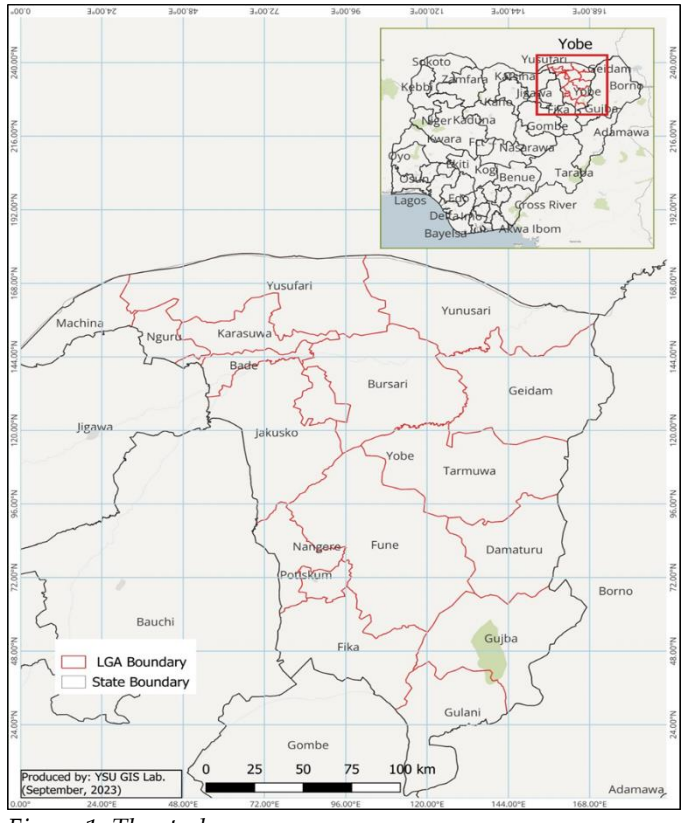


*Figure 1: The study area*
*Source: YSU GIS Lab (2023)*

### 2.2 Data Sources

Primary data were collected using a triangulated approach of structured household surveys. The household survey targeted displaced farming households and collected information on socio-economic characteristics, agricultural land access, land utilization practices, livelihood strategies, asset losses, and institutional access. The structured questionnaire enabled standardized measurement of livelihood indicators across the sampled population. Data collection was conducted using a systematic, multi-stage, and participatory approach designed to ensure the reliability, credibility, and contextual relevance of the research findings.

Both quantitative and qualitative techniques were employed to capture the complex realities of displaced farming households and their interactions with host communities. This triangulated data collection approach enabled the study to capture both household-level experiences and broader community-level dynamics, particularly regarding land access arrangements, livelihood transitions, coping strategies, and the socio-institutional influences shaping IDP livelihoods. Fieldwork activities were carried out by trained enumerators familiar with local sociocultural contexts and languages. Enumerators were carefully selected and trained to ensure adherence to ethical standards, cultural sensitivity, and methodological consistency throughout the data collection process.

Structured questionnaires were administered to IDPs using a multistage sampling design. The study employed a multistage purposive sampling strategy. In the first stage, five Local Government Areas (Bade, Bursari, Damaturu, Geidam, and Potiskum) with the highest concentration of IDPs were purposively selected. In the second stage, host communities with high concentrations of IDPs were selected: Nasarawa, Zango, and Nayi-Nawa (Bade LGA); Dapchi and Baimari (Bursari LGA); Kuka-Reta and Kasaisa (Damaturu LGA); Hausari, Ajiyari, and Nasarawa (Geidam LGA); and Shagari Housing Estate, Nahuta, and Tandari (Potiskum LGA). In the final stage, sampling was restricted to IDPs who were either currently engaged in farming or actively seeking access to agricultural land.

A total of 414 respondents were sampled based on the relative concentration of IDPs, with Bade LGA accounting for 72 respondents (Nasarawa = 25, Zango = 23, Nayi-Nawa = 24), Bursari LGA 58 respondents (Dapchi = 30, Baimari = 28), Damaturu LGA 64 respondents (Kuka-Reta = 35, Kasaisa = 29), Geidam LGA 90 respondents (Hausari = 32, Ajiyari = 28, Nasarawa = 30) and Potiskum LGA 130 respondents (Shagari Housing Estate = 48, Nahuta = 42, Tandari = 40). The required sample size was estimated using the finite population correction formula:

$$n = \frac{N}{1 + N(e^2)}$$

where $n$ represents the required sample size, $N$ denotes the estimated population of displaced farming households within the selected communities, and $e$ is the acceptable margin of error (set at 0.05). The computed sample was proportionally allocated across LGAs and communities according to the relative distribution of displaced farming households to ensure geographical representation. In each selected community, systematic random sampling was applied. The sampling interval was calculated as:

$$k = \frac{N}{n}$$

Following a random start between 1 and $k$, every $k^{th}$ eligible household was selected. When a selected household was unavailable or declined participation, the next eligible household was approached to maintain continuity and reduce potential selection bias. The questionnaire consisted of both closed-ended and open-ended items designed to capture data on pre- and post-displacement livelihood activities, access to agricultural land, land utilization patterns, tenure arrangements, asset erosion, income diversification, institutional access, and socio-economic outcomes. The instrument was pre-tested in a demographically comparable but non-sampled community to assess clarity, sequencing, and internal consistency. Necessary revisions were implemented before full deployment.

### 2.3 Data Analysis

Data analysis was conducted using descriptive statistical techniques. These techniques were used to summarize and interpret patterns relating to livelihood activities, agricultural land access, land utilization, and socio-economic conditions among displaced households. Descriptive statistics, including frequencies, percentages, and cross-tabulations, were used to present the distributions of key variables and to identify major trends in livelihood transitions and land access dynamics among the sampled population.

## 3 Results and Discussion

Table 1 highlights the pre-displacement livelihood structure of IDPs in Yobe State, revealing a predominantly agrarian economy shaped by the Sudan–Savanna ecological system. The dominance of crop farming (49.4%) confirmed the centrality of rain-fed agriculture in rural northern Nigeria, consistent with established evidence that livelihoods in this region are highly climate-sensitive (Madu & Nwankwo, 2020; Mahmood et al., 2020). This dependence implied that pre-displacement livelihoods were inherently vulnerable to rainfall variability and environmental stress,

reinforcing findings that climate variability significantly constrains agricultural productivity in the Lake Chad Basin (Pham-Duc et al., 2020; Mahmood et al., 2020). Livestock rearing (17.3%) and trading (14.6%) further reflect diversified but interdependent livelihood systems. The integration of crop and livestock production aligned with established adaptation strategies in semi-arid environments, where diversification enhances resilience through risk spreading (Madu & Nwankwo, 2020; Okpara et al., 2018). However, the relatively modest share of non-farm activities such as skilled trades (9.1%) suggests limited structural diversification, indicating that most households remained tied to natural-resource-based systems. This pattern supported arguments that rural diversification in fragile environments is often constrained by limited capital, infrastructure, and market access (Maxwell et al., 2017). Similarly, the low engagement in fishing (5.3%) and artisanal work (4.3%) reflects spatial and ecological limitations, particularly the uneven distribution of water resources in the region (Buma et al., 2018).

**Table 1: Primary Livelihood Options Before Displacement**

| Variable | Response Options | Percentage (%) |
|---|---|---|
| **Primary source of livelihood before displacement** | Crop farming | 49.4 |
| | Livestock rearing | 17.3 |
| | Trading | 14.6 |
| | Fishing | 5.3 |
| | Skilled trade | 9.1 |
| | Other (e.g., artisanal work) | 4.3 |
| | | **100%** |
| **Engaged in more than one livelihood activity** | Yes | 69.3 |
| | No | 30.7 |
| | | **100%** |
| **Type of agricultural activity** | Rain-fed farming only | 41.7 |
| | Irrigated farming only | 7.7 |
| | Rain-fed and irrigation farming | 16.3 |
| | Livestock farming only | 10.6 |
| | Rain-fed and livestock farming | 15.1 |
| | Irrigation and livestock farming | 4.6 |
| | Backyard farming | 2.4 |
| | Others | 1.7 |
| | | **100%** |

The findings further revealed that 69.3% of households engaged in multiple livelihood activities before displacement, indicating widespread diversification. While diversification is often associated with resilience, in this context, it also reflects structural vulnerability, where households adopt multiple activities as a necessity rather than a strategy for accumulation (Sobczak-Szelc & Fekih, 2020; Morales-Muñoz et al., 2020). This aligned with evidence from the Lake Chad Basin that diversification often functions as a coping mechanism in response to environmental uncertainty and livelihood instability (Zieba et al., 2017). Thus, despite diversification, households remained exposed to shocks due to low productivity and limited asset bases (Maxwell et al., 2017). Agricultural practices further reinforced this vulnerability. The dominance of rain-fed farming (41.7%) highlighted heavy reliance on seasonal rainfall, with limited adoption of irrigation (7.7%) or combined systems (16.3%). This confirmed broader regional patterns of low irrigation infrastructure and weak water management systems (Okpara et al., 2018), making agricultural production highly susceptible to climate variability (Pham-Duc et al., 2020; Mahmood et al., 2020). Although mixed crop–livestock systems (15.1%) provide some risk buffering, their effectiveness is constrained by environmental degradation and resource scarcity.

Generally, the findings indicated that pre-displacement livelihoods were both productive and structurally fragile, relying heavily on climate-sensitive natural resources. This supports existing literature that populations dependent on ecological systems are disproportionately affected by environmental stress and conflict, leading to displacement and livelihood disruption (Abel et al., 2019; Mach et al., 2019). In the Lake Chad Basin, the interaction between environmental change and conflict has been identified as a key driver of such disruptions (Kamta et al., 2020; Borderon et al., 2019). The implications of these findings are significant. Displacement not only disrupts income sources but also

dismantles integrated livelihood systems, including access to land, livestock assets, and social networks. Given the central role of land-based livelihoods, restricted access to agricultural land in host communities severely limits recovery pathways for IDPs. This reinforced evidence that land access is a critical determinant of post-displacement livelihood reconstruction and resilience (Gwadabe et al., 2018; Maxwell et al., 2017). Without secure and equitable access to land, displaced households are likely to remain trapped in low-return, informal coping strategies, thereby prolonging vulnerability and undermining sustainable reintegration.

### 3.1 Access to Agricultural Land

The findings in Table 2 revealed critical insights into land tenure systems and livelihood sufficiency before displacement, highlighting structural conditions that shaped both resilience and vulnerability. Land access was dominated by family land (41.2%), followed by ownership (23.3%), borrowing (15.3%), renting (11.0%), and no access (9.1%). This pattern reflected the prevalence of customary tenure systems, where land rights are embedded in kinship structures rather than formal documentation (Arhin-Sam, 2019). While such systems promote intra-community access, they provide limited security for outsiders and are generally characterised by weak tenure protection (Okpara et al., 2018; Zieba et al., 2017). The relatively low proportion of landowners further indicated weak formal tenure security, a known constraint on agricultural productivity in northern Nigeria (Madu & Nwankwo, 2020). Borrowed and rented land arrangements demonstrate flexibility but also significant insecurity. These short-term arrangements discourage long-term investments in land improvement and increase vulnerability to environmental stress, as widely documented in semi-arid regions (Okpara et al., 2018; Mahmood et al., 2020). Households without land access (9.1%) represent the most vulnerable group, often relying on precarious livelihood strategies such as wage labour and petty trade (Sobczak-Szelc & Fekih, 2020; Morales-Muñoz et al., 2020).

**Table 2: Access to Agricultural Lands**

| Variable | Response Options | Percentage (%) |
|---|---|---|
| Access to agricultural land before displacement | Owned | 23.3 |
| | Rented | 11.0 |
| | Borrowed | 15.3 |
| | Family land | 41.2 |
| | No access | 9.2 |
| | | **100%** |
| Size of land cultivated before displacement | < 1 hectare | 21.8 |
| | 1–3 hectares | 45.3 |
| | 4–6 hectares | 20.9 |
| | > 6 hectares | 12.0 |
| | | **100%** |
| Sufficiency of livelihood to meet household needs | Always sufficient | 17.3 |
| | Sometimes sufficient | 42.2 |
| | Rarely sufficient | 25.7 |
| | Not sufficient | 14.9 |
| | | **100%** |

Landholding size further reinforces structural inequality. Most households (45.3%) cultivated 1–3 hectares, while 21.8% cultivated less than one hectare, confirming the dominance of smallholder systems typical of the Sahel (Madu & Nwankwo, 2020; Zieba et al., 2017). Small and fragmented plots limit productivity and constrain mechanisation, while households farming less than one hectare are largely subsistence-oriented and highly vulnerable to food insecurity (Pham-Duc et al., 2020; Mahmood et al., 2020). In contrast, the small proportion with larger holdings (12.0%) suggests pre-existing socio-economic disparities. Livelihood sufficiency data further indicate widespread vulnerability before displacement. Only 17.3% reported consistent sufficiency, while 82.8% experienced varying levels of insufficiency. This reflects structural constraints such as declining soil fertility, climate variability, and limited access to inputs and markets (Mahmood et al., 2020; Pham-Duc et al., 2020). In addition, insecurity linked to the Boko Haram insurgency had already begun to disrupt agricultural activities, forcing farmers to abandon farmlands and reducing productivity (Anugwom, 2018; Gwadabe et al., 2018). This supports broader evidence that conflict and environmental stress

jointly undermine rural livelihoods even before displacement (Abel et al., 2019; Kamta et al., 2020). Generally, the findings demonstrated that livelihoods were already structurally fragile before displacement, shaped by insecure tenure systems, smallholder constraints, climatic pressures, and rising insecurity. This context is critical in explaining the severity of post-displacement livelihood loss and underscores the central role of land access in recovery. In fragile settings such as northeastern Nigeria, disruptions to land access not only reduce income but also weaken long-term resilience and adaptive capacity (Scheffran et al., 2019; Maxwell et al., 2017).

The findings present a livelihood system that was predominantly agrarian, climate-sensitive, and structurally fragile before displacement. The dominance of crop farming (49.4%) and livestock rearing (17.3%) confirmed strong dependence on natural resources and seasonal climatic cycles, consistent with evidence from northern Nigeria and the Lake Chad Basin (Madu & Nwankwo, 2020; Okpara et al., 2018). This reliance increases vulnerability to climatic variability, including drought and erratic rainfall, widely documented in semi-arid environments (Mahmood et al., 2020; Pham-Duc et al., 2020). Landholding patterns further reflect structural constraints. Most households cultivated 1–3 hectares (45.3%) or less than 1 hectare (21.8%), indicating smallholder dominance characterized by low productivity and limited economies of scale (Madu & Nwankwo, 2020; Zieba et al., 2017). These constraints are reinforced by insecure tenure arrangements, borrowed (15.3%), rented (11.0%), and family-based access (41.2%), which discourage long-term investments in land improvement (Arhin-Sam, 2019; Okpara et al., 2018). Customary tenure systems, while socially embedded, often reproduce inequalities, particularly for those without lineage-based access (Zieba et al., 2017; Arhin-Sam, 2019).

Although 69.3% of households engaged in multiple livelihood activities, this diversification reflects coping rather than accumulation. Consistent with findings from environmentally constrained regions, diversification emerges as a response to climate variability and economic instability rather than a pathway to sustained growth (Morales-Muñoz et al., 2020; Sobczak-Szelc & Fekih, 2020; Borderon et al., 2019). Livelihood sufficiency levels further highlighted pre-existing vulnerability. Only 17.2% reported consistent sufficiency, while 82.8% experienced varying levels of insufficiency, reflecting constraints such as declining soil fertility, weak infrastructure, and limited access to inputs (Mahmood et al., 2020; Pham-Duc et al., 2020; Scheffran et al., 2019). These conditions were further exacerbated by conflict-related insecurity, which restricted access to farmland and reduced productivity even before displacement (Gwadabe et al., 2018; Anugwom, 2018). This supports broader evidence that the interaction of conflict and environmental stress drives livelihood erosion in northeastern Nigeria (Kamta et al., 2020; Abel et al., 2019).

Generally, land emerges as the central determinant of livelihood stability, yet access remains unequal and insecure. Households with limited or no land are particularly vulnerable, reflecting structural poverty and tenure constraints (Mach et al., 2019; Maxwell et al., 2017). These findings implied that recovery strategies must move beyond restoring pre-displacement conditions toward transforming rural livelihoods. Interventions should prioritise equitable land access, climate-resilient agriculture and diversified income opportunities, alongside improvements in irrigation, governance and institutional support (Okpara et al., 2018; Mahmood et al., 2020; Maxwell et al., 2017; Scheffran et al., 2019).

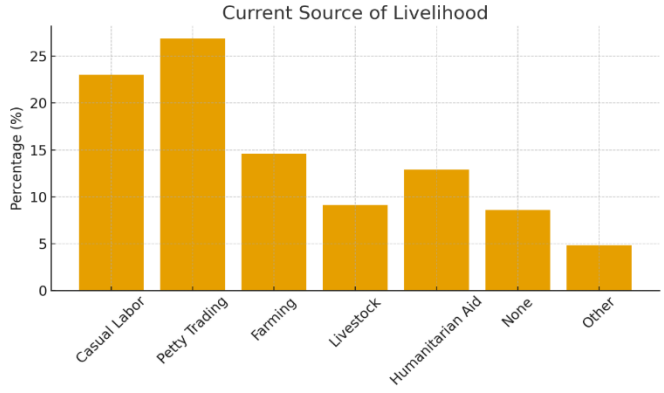


*Figure 2: IDPs' current sources of livelihood*

Figure 2 revealed a clear shift away from agriculture, historically the dominant livelihood in Yobe State. Petty trading (26.9%) and casual labour (23.0%) now dominate, reflecting a transition to low-capital, survival-oriented activities typical of displacement contexts (Maxwell et al., 2017; El Ghamari & Bartoszewicz, 2020). Only 14.6% remain in farming, indicating significant disruption due to land loss, insecurity, and weak tenure systems, consistent with patterns of livelihood erosion in conflict-affected regions (Gwadabe et al., 2018; Kamta et al., 2020). Low engagement in livestock rearing (9.1%) further reflected the asset depletion and mobility constraints common among displaced agropastoral populations (Madu & Nwankwo, 2020; Okpara et al., 2018). At the same time, 12.9% depend on humanitarian assistance and 8.6% have no livelihood, indicating reduced self-reliance and persistent vulnerability (Maxwell et al., 2017; El Ghamari & Bartoszewicz, 2020). These patterns suggested a fragmented livelihood system dominated by informal activities and external support,

with reduced agricultural participation implying weakened food security and resilience (Borderon et al., 2019; Morales-Muñoz et al., 2020). Generally, restricted access to agricultural land remains a key structural barrier to livelihood recovery, as its loss undermines both income generation and long-term adaptive capacity in agrarian settings (Scheffran et al., 2019; Abel et al., 2019).

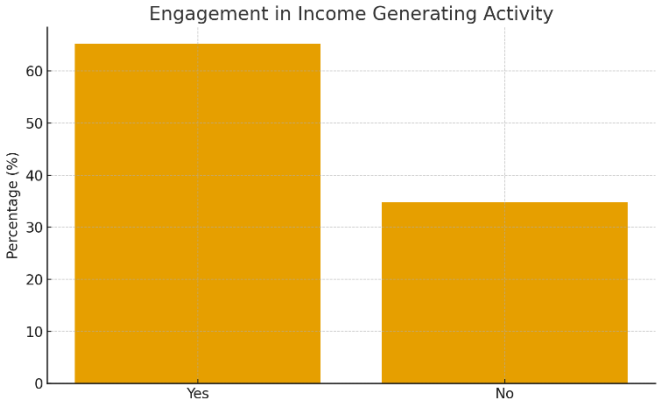


*Figure 3: Engagement in Income-Generating Activity*

With 65.2% of IDPs engaged in income-generating activities (IGAs) (see Figure 3), the findings indicated notable efforts to rebuild livelihoods despite significant constraints. However, the dominance of casual labour and petty trading reflects reliance on low-return, informal activities typical of displacement contexts where access to land and assets is lost (Maxwell et al., 2017; El Ghamari & Bartoszewicz, 2020). Although adaptive, these strategies are highly precarious. The 34.8% not engaged in any IGA highlights substantial economic exclusion, driven by asset loss, insecurity, and limited opportunities in host communities (Gwadabe et al., 2018; Kamta et al., 2020). Limited access to capital and credit further constrains diversification into more stable livelihoods, reinforcing dependence on low-entry activities (Maxwell et al., 2017; Arhin-Sam, 2019). As a result, participation in IGAs does not necessarily translate into resilience, as most activities generate irregular and insufficient income. This supports evidence that displaced populations remain trapped in economic precarity without access to land or improved livelihood opportunities (Scheffran et al., 2019; Morales-Muñoz et al., 2020). The high level of IGA participation reflected survival-driven adaptation rather than economic empowerment, underscoring the need for structural interventions that enhance access to productive resources and sustainable livelihoods.

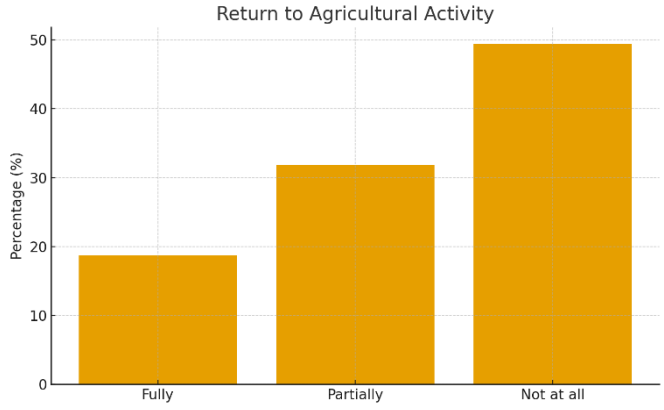


*Figure 4: IDPs Return to Agricultural Activity*

Only 18.7% of IDPs have fully returned to agriculture, 31.9% partially, while 49.4% have not returned at all (see Figure 4). This limited reintegration reflects constraints such as land scarcity, insecure tenure, and resource competition in host communities (Okpara et al., 2018; Arhin-Sam, 2019). Full return requires access to land, labour, and capital, assets often lost during displacement (Maxwell et al., 2017; Gwadabe et al., 2018). Partial return likely represents temporary or informal arrangements with low productivity and high uncertainty, typical of customary tenure systems that lack long-term security (Arhin-Sam, 2019; Zieba et al., 2017). The large proportion (49.4%) not engaged in farming indicated continued disconnection from primary livelihoods, increasing reliance on informal work and humanitarian support (Maxwell et al., 2017; El Ghamari & Bartoszewicz, 2020). These patterns reflected broader structural barriers, including restrictive tenure systems and competition for scarce land (Arhin-Sam, 2019; Okpara et al., 2018). The decline in agricultural participation has significant implications, contributing to reduced food production, weakened household nutrition, and persistent vulnerability, further exacerbated by climate variability in the Lake Chad Basin (Mahmood et al., 2020; Pham-Duc et al., 2020). Generally, effective reintegration into agriculture requires targeted interventions such as improved land access, extension support, and land rehabilitation to restore productivity and strengthen long-term resilience (Maxwell et al., 2017; Scheffran et al., 2019).

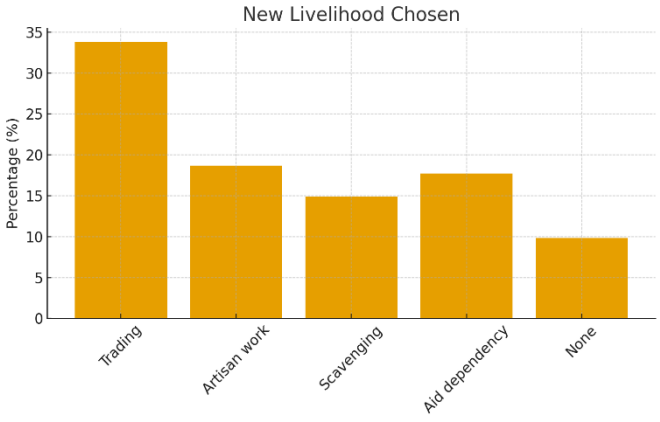


*Figure 4: New Livelihood Options*

The shift toward new livelihood activities reflects adaptive responses by IDPs to land shortages and restricted access to agrarian systems (see Figure 4). Trading (33.8%) dominated, indicating a transition to low-capital, accessible activities typical of displacement contexts where agricultural options are constrained (Maxwell et al., 2017; Morales-Muñoz et al., 2020). Artisanal work (18.7%) revealed a move toward skill-based non-farm activities, consistent with diversification strategies in fragile environments (Sobczak-Szelc & Fekih, 2020; Borderon et al., 2019). However, engagement in scavenging (14.9%) reflected severe livelihood deprivation and risk exposure, often linked to limited access to productive resources (El Ghamari & Bartoszewicz, 2020). Aid dependence (17.7%) and the 9.8% with no livelihood further indicate constrained self-reliance and economic exclusion in protracted displacement settings (Gwadabe et al., 2018; Maxwell et al., 2017). Generally, these patterns show a shift from land-based livelihoods to informal, survival-oriented activities. While indicative of adaptation, their low returns and instability suggest they are short-term coping strategies rather than sustainable recovery pathways, particularly in contexts of environmental stress and conflict (Scheffran et al., 2019; Kamta et al., 2020).

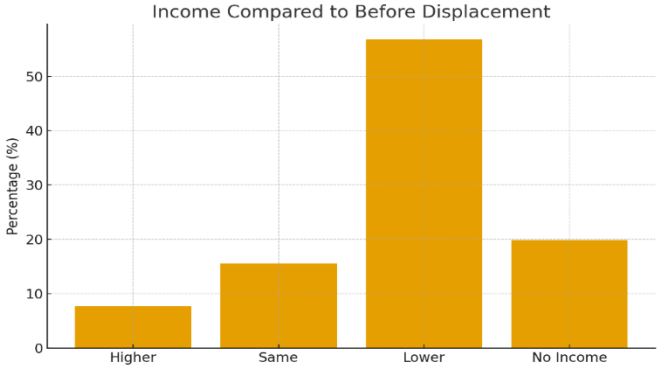


*Figure 5: Income Comparison*

Changes in income levels show a significant economic decline following displacement. As shown in Figure 5, only 7.7% reported higher income and 15.6% no change, while 56.8% reported lower income and 19.9% no income, indicating severe livelihood erosion. This aligned with evidence that displacement disrupts agricultural systems, depletes assets, and weakens market integration (Maxwell et al., 2017; Gwadabe et al., 2018). The shift to low-paying informal activities has not offset the loss of land-based livelihoods, reinforcing patterns of declining income and economic instability in displacement contexts (El Ghamari & Bartoszewicz, 2020; Morales-Muñoz et al., 2020). The 19.9% with no income represent extreme vulnerability, often linked to limited skills, restricted mobility, and lack of capital (Arhin-Sam, 2019; Kamta et al., 2020). In contrast, the small proportion with increased income (7.7%) likely reflects successful adaptation through engagement in alternative activities (Sobczak-Szelc & Fekih, 2020). In essence, the findings highlighted the central role of land and productive assets in sustaining rural livelihoods and underscore the need for integrated interventions that improve access to land, finance, and skills to support recovery and resilience (Scheffran et al., 2019; Okpara et al., 2018).

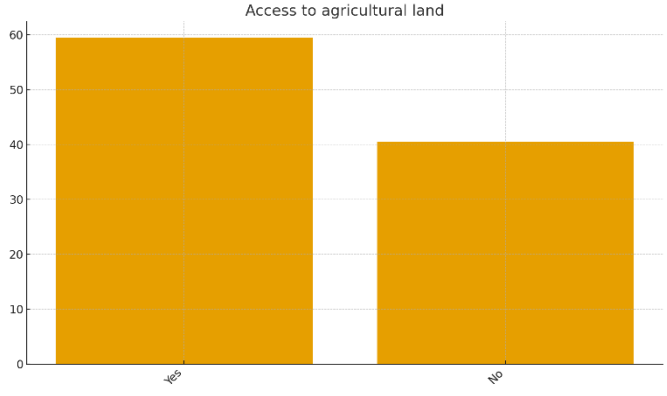


*Figure 6: Access to Agricultural Land*

Access to agricultural land is central to livelihood recovery. Figure 6 revealed that 59.5% of IDPs have land access, while 40.5% do not, indicating partial but inadequate inclusion in host community systems. These reflected constraints associated with customary tenure and population pressure, which limit access for displaced groups (Arhin-Sam, 2019; Okpara et al., 2018). Environmental challenges such as desertification and declining soil fertility further intensify land scarcity in the Lake Chad Basin (Mahmood et al., 2020; Pham-Duc et al., 2020). Access is also shaped by social relations and host community perceptions, often excluding those without customary claims (Zieba et al., 2017; Arhin-Sam, 2019). The exclusion of a substantial proportion of IDPs from land access undermines food production and income generation, reinforcing dependence on informal

labour and aid (Maxwell et al., 2017; Gwadabe et al., 2018). In agrarian settings, this highlighted land access as a key structural driver of vulnerability, requiring inclusive governance and targeted interventions to support equitable access and sustainable recovery (Scheffran et al., 2019; Abel et al., 2019).

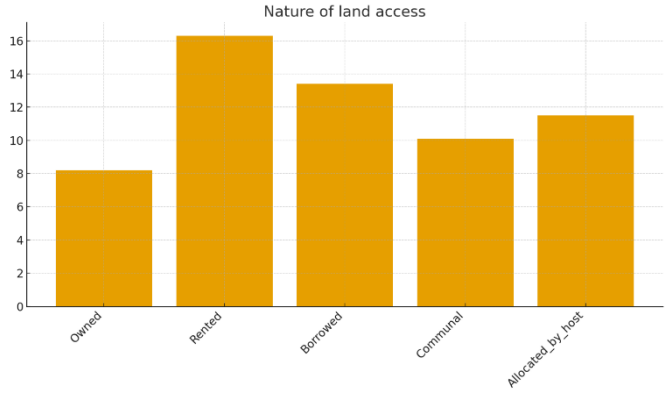


*Figure 7: Nature of Land Access*

The distribution of land access types, owned (8.2%), rented (16.3%), borrowed (13.4%), communal (10.1%), and host-allocated (11.5%) (see Figure 7), indicated strong reliance on insecure and temporary tenure systems. This aligned with evidence that displaced populations rarely access land ownership and instead depend on informal arrangements shaped by customary institutions and local power dynamics (Arhin-Sam, 2019; Okpara et al., 2018). Rented land reflects growing land commodification under resource pressure, while borrowed and communal access, though flexible, lack long-term security (Mahmood et al., 2020; Zieba et al., 2017; Arhin-Sam, 2019). Host-allocated land further highlighted reliance on discretionary access rather than enforceable rights. Such insecure tenure discourages long-term investments in land improvement, contributing to low productivity and continued dependence on informal livelihoods and aid (Maxwell et al., 2017; Scheffran et al., 2019). This underscored the need for strengthened land governance and more secure access arrangements to enhance agricultural productivity, food security, and long-term resilience among IDPs (Abel et al., 2019; Okpara et al., 2018).

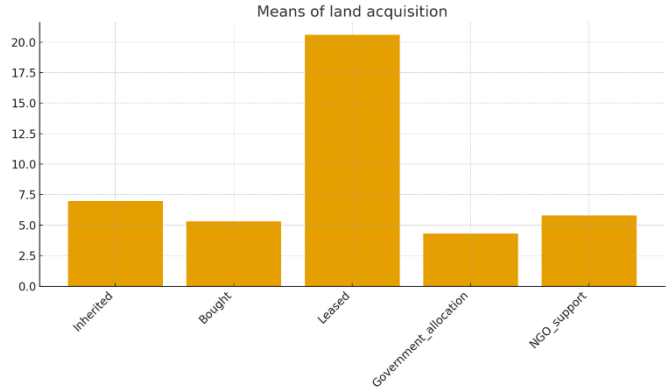


*Figure 8: Means of Land Acquisition*

The distribution of land acquisition mechanisms in Figure 8 revealed a shift from secure, lineage-based systems to market-driven access among IDPs. Leased land dominates (20.6%), reflecting increasing commodification under conditions of scarcity and displacement (Arhin-Sam, 2019; Mahmood et al., 2020). In contrast, inherited (7.0%) and purchased (5.3%) land, indicators of secure tenure, are limited to 12.3% of respondents, highlighting the erosion of customary land rights following displacement (Zieba et al., 2017; Arhin-Sam, 2019). The reliance on leasing suggests a transition toward short-term, economically driven arrangements that are often unstable, discouraging investment in land improvement and reducing productivity (Okpara et al., 2018; Maxwell et al., 2017). Institutional support is limited, with only 4.3% accessing land through government and 5.8% through NGOs, reflecting weak governance and inadequate policy implementation in addressing land access challenges (Gwadabe et al., 2018; Kamta et al., 2020). This indicated that many interventions focus on short-term support rather than structural issues such as secure land access, which is critical for sustainable livelihood recovery.


*Figure 9: Distance to Farmlands*

The distance between IDPs' residences and farmlands is a major constraint to agricultural productivity (see Figure 9). Only 13% access land is within 1 km, while over 60% cultivate beyond 3 km, including 34.8% travelling more

than 6 km. These distances reduce labour efficiency and limit effective farm management, consistent with evidence from semi-arid regions where spatial constraints lower productivity (Madu & Nwankwo, 2020; Mahmood et al., 2020). Distance also interacts with insecurity, increasing exposure to risks and discouraging regular farm engagement (Gwadabe et al., 2018; Anugwom, 2018; Kamta et al., 2020; Abel et al., 2019). Long travel distances impose additional costs and reduce time available for other income activities, while limiting the adoption of intensive practices such as irrigation and livestock farming (Okpara et al., 2018; Pham-Duc et al., 2020). This spatial mismatch contributes to lower yields, reduced technology uptake, and greater vulnerability. Overall, improving access to nearby farmland, strengthening security, and enhancing rural mobility are critical for restoring agricultural productivity and supporting sustainable livelihoods (Scheffran et al., 2019; Maxwell et al., 2017).

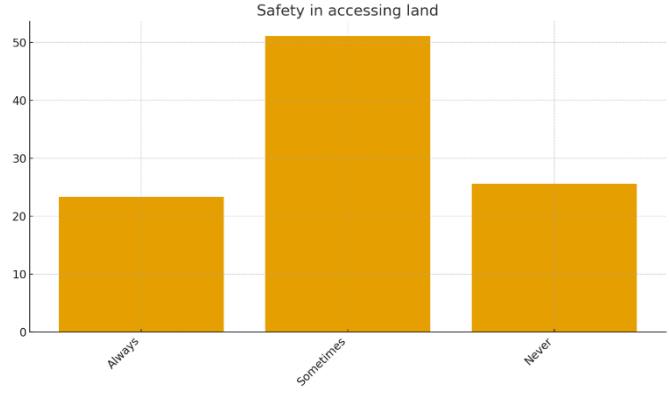


*Figure 10: Safety in Accessing Farmlands*

Safety conditions strongly influence IDPs' agricultural engagement (see Figure 10). Only 23.3% reported always feeling safe, while 51.1% felt sometimes safe and 25.6% never felt safe, indicating widespread insecurity. This reflects persistent conflict dynamics in the Lake Chad Basin, where insurgency, criminality, and resource competition constrain land access (Gwadabe et al., 2018; Kamta et al., 2020; Anugwom, 2018; Okpara et al., 2018). Such insecurity reduces farm attendance, shortens working hours, and lowers productivity, consistent with evidence from conflict-affected agrarian systems (Abel et al., 2019; Scheffran et al., 2019). Insecurity also restricts mobility and access to resources, reinforcing reliance on informal livelihoods and humanitarian support (Maxwell et al., 2017; El Ghamari & Bartoszewicz, 2020). The associated psychological stress further discouraged participation in farming and weakened resilience (Scheffran et al., 2019). Generally, persistent insecurity highlighted gaps in local protection systems and institutional responses (Gwadabe et al., 2018; Kamta et al., 2020). Addressing safety alongside land access and livelihood support is therefore critical for restoring agricultural productivity and long-term resilience.

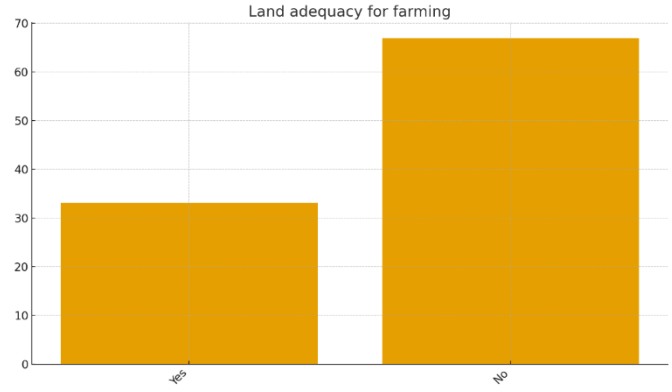


*Figure 10: Land Adequacy for Farming*

As shown in Figure 10, only 33.1% of respondents reported adequate land, while 66.9% reported inadequacy, highlighting land scarcity as a major barrier to agricultural recovery. This reflects constraints such as small plot sizes, fragmentation, and poor soil conditions common in semi-arid systems (Madu & Nwankwo, 2020; Mahmood et al., 2020). Limited land reduces productivity, restricts crop diversification, and heightens vulnerability to climate shocks (Pham-Duc et al., 2020; Scheffran et al., 2019). Access to land is also shaped by socio-economic inequalities, with better plots often secured through financial capacity or social networks, excluding poorer households (Arhin-Sam, 2019; Zieba et al., 2017). The growing monetization of land further intensifies competition and limits access for vulnerable groups (Mahmood et al., 2020). As a result, many IDPs rely on informal livelihoods and humanitarian aid, reinforcing cycles of vulnerability (Maxwell et al., 2017; Gwadabe et al., 2018). Overall, improving agricultural recovery requires equitable land access, mediated agreements within host communities, and livelihood diversification to enhance food security and resilience (Okpara et al., 2018; Scheffran et al., 2019).

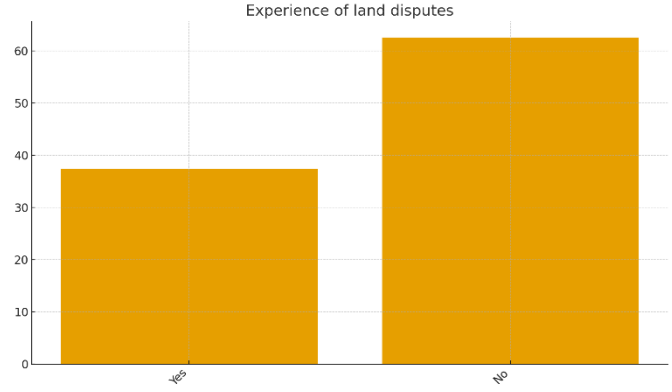


*Figure 11: Experiences in Land Disputes*

Land disputes, reported by 37.4% of respondents (Figure

11), highlighted tensions in host–IDP land relations driven by overlapping claims, unclear boundaries, and competition over scarce resources (Okpara et al., 2018; Mahmood et al., 2020). These challenges are intensified by customary tenure systems, where land allocation lacks formal documentation and enforceable ownership (Arhin-Sam, 2019; Zieba et al., 2017). Such disputes undermine agricultural productivity, as affected households may abandon or lose access to farmland, reinforcing vulnerability (Scheffran et al., 2019; Abel et al., 2019). The 62.6% reporting no disputes suggests that traditional institutions and local mediation mechanisms play a stabilizing role in managing land access and supporting coexistence (Arhin-Sam, 2019; Okpara et al., 2018). However, strengthening these systems through integration with formal land governance is essential. Transparent allocation processes, inclusive engagement, and structured dispute resolution can reduce tensions, improve tenure security, and support sustainable livelihood recovery (Maxwell et al., 2017; Kamta et al., 2020).

## 4 Conclusion

This study assessed the livelihood dynamics and patterns of agricultural land access among IDPs in Yobe State in the broader context of displacement across the Lake Chad Basin. The findings demonstrated that forced displacement has profoundly disrupted the agrarian livelihood systems that historically sustained rural households in northeastern Nigeria. Before displacement, livelihoods were predominantly land-based, with crop farming and livestock rearing constituting the backbone of household economic activities. However, displacement severed access to these productive assets, leading to a marked transformation of livelihood structures and pushing many displaced households into precarious, informal economic activities. The results revealed that although a proportion of IDPs have regained some form of access to agricultural land in host communities, such access is largely insecure, temporary, and mediated through informal arrangements such as renting, borrowing, or host allocations. These fragile tenure arrangements, combined with inadequate landholdings, poor soil fertility, long travel distances to farmland, and persistent insecurity, significantly constrain displaced households' capacity to re-establish sustainable agricultural livelihoods. Consequently, many IDPs have shifted toward survival-oriented activities such as petty trading, casual labour, and humanitarian assistance, which provide limited income stability and weaken long-term livelihood resilience.

The study further highlights that the displacement crisis has intensified pre-existing structural vulnerabilities within rural livelihood systems, including land fragmentation, climate-sensitive agriculture, weak rural infrastructure, and insecure tenure arrangements. These structural constraints mean that livelihood recovery cannot be achieved solely through short-term humanitarian assistance. Instead, sustainable reintegration requires comprehensive interventions that address both the immediate and systemic barriers faced by displaced populations.

Therefore, the study underscored the need for integrated policy responses that prioritize equitable access to agricultural land, strengthen land tenure security, and rehabilitate degraded farmlands. Expanding climate-resilient agricultural support, strengthening extension services, improving access to agricultural inputs, and facilitating livelihood diversification through credit and skills development programs are essential for restoring economic self-reliance among displaced households. Additionally, strengthening community-based land governance mechanisms and promoting transparent land allocation systems can reduce land-related conflicts and enhance tenure stability for displaced farmers. The findings generally suggested that livelihood recovery among IDPs in the Lake Chad Basin must be land-centered, climate-sensitive, and institutionally supported. Addressing the complex intersection of displacement, environmental stress, and land governance challenges is critical for fostering long-term resilience, reducing dependence on humanitarian aid, and promoting sustainable socio-economic reintegration in conflict-affected agrarian communities.

## References

Abbas, A. M. (2017). Climate change and forced migration from Ngala and Kala-Balge LGAs, N.E. Borno State, Nigeria. In S. Pirasteh & J. Li (Eds.), Global changes and natural disaster management: Geo-information technologies. Springer.

Abel, G. J., Brottrager, M., Cuaresma, J. C., & Muttarak, R. (2019). Climate, conflict, and forced migration. Global Environmental Change, 54, 239–249.

Akubor, E. O. (2017). Climate change, migration, and conflict: A historical survey of people of Northern Nigeria and its neighbours from the period of the Mega Chad. Localities, 7, 9–41.

Anugwom, E. E. (2018). Islamic fundamentalism and religious conflicts in Nigeria: Reflections on the Boko Haram insurgency. Politics and Religion Journal,12(2), 225–243.

Arhin-Sam, K. (2019). The political economy of migration

governance in Nigeria. Arnold-Bergstraesser-Institute.

Borderon, M., Sakdapolrak, P., Muttarak, R., Kebede, E., Pagogna, R., & Sporer, E. (2019). Migration influenced by environmental change in Africa: A systematic review of empirical evidence. Demographic Research, 41, 491–544.

Buma, W. G., Lee, S., & Seo, J. Y. (2018). Recent surface water extent of Lake Chad from multispectral sensors and GRACE. Sensors, 18(7), 2082.

El Ghamari, M., & Bartoszewicz, M. G. (2020). (Un)sustainable development of minors in Libyan refugee camps in the context of conflict-induced migration: Sustainability, 12(11), 4537.

Fiske, S. J., Crate, S. A., Crumley, C. L., Galvin, K., Lazrus, H., Lucero, L., Oliver Smith, A., Orlove, B., Strauss, S., & Wilk, R. (2014). Changing the atmosphere: Anthropology and climate change. American Anthropological Association.

Gwadabe, N. M., Salleh, M. A., Ahmad, A. A., & Jamil, S. (2018). Forced displacement and the plight of internally displaced persons in Northeast Nigeria. Humanities and Social Sciences Research, 1(1), 46.

Ide, T., López, M. R., Fröhlich, C., & Scheffran, J. (2020). Pathways to water conflict during drought in the MENA region. Journal of Peace Research, 57(5), 1–15.

Kamta, F. N., Hossein, A., & Scheffran, J. (2020). The root causes of the crisis in Northeast Nigeria: Historical, socioeconomic and environmental dimensions. Mediterranean Journal of Social Sciences, 11(3), 95–104.

Mach, K. J., Kraan, C. M., Adger, N. W., Buhaug, H., Burke, M., Fearon, J. D., Field, C. B., Hendrix, C. S., Maystadt, J. F., O'Loughlin, J., et al. (2019). Climate as a risk factor for armed conflict. Nature, 571, 193–197.

Madu, I. A., & Nwankwo, C. F. (2020). Spatial pattern of climate change and farmer herder conflict vulnerabilities in Nigeria. GeoJournal, 85(5), 1–17.

Mahmood, R., Jia, S., Mahmood, T., & Mehmood, A. (2020). Predicted and projected water resources changes in the Chari catchment of the Lake Chad Basin, Africa. Journal of Hydrology, 21, 73–91.

Maxwell, D., Stites, E., Robillard, S. C., & Wagner, M. (2017). Conflict and resilience: A synthesis of Feinstein International Center work on building resilience and protecting livelihoods in conflict-related crises. Feinstein International Center, Tufts University.

Morales-Muñoz, H., Jha, S., Bonatti, M., Alff, H., Kurtenbach, S., & Sieber, S. (2020). Exploring connections: Environmental change, food security and violence as drivers of migration—A critical review of research. Sustainability, 12(14), 5702.

Ogbonna, C. C., & Jiménez, J. A. R. (2017). The inordinate activities of Boko Haram: A critical review of facts and challenges. Revista de Investigaciones Políticas y Sociológicas, 16(1), 9–24.

Okpara, U. T., Stringer, L. C., & Dougill, A. J. (2018). Integrating climate adaptation, water governance and conflict management policies in lake riparian zones: insights from African drylands. Environmental Science & Policy, 79, 36–44.

Pham-Duc, B., Sylvestre, F., Papa, F., Frappart, F., Bouchez, C., & Crétaux, J. F. (2020). The Lake Chad hydrology under current climate change. Scientific Reports, 10, 1–10.

Population Reference Bureau. (2020). 2019 World Population Data Sheet.

Scheffran, J., Link, P. M., & Schilling, J. (2019). Climate and conflict in Africa. In Oxford research encyclopedia of climate science. Oxford University Press.

Sobczak-Szelc, K., & Fekih, N. (2020). Migration as one of several adaptation strategies for environmental limitations in Tunisia: Evidence from El Faouar. Comparative Migration Studies, 8(1), 1–20.

Zenn, J. (2020). Boko Haram's conquest for the caliphate: How Al-Qaeda helped Islamic State acquire territory. Studies in Conflict & Terrorism, 43(2), 89–122.

Zieba, F. W., Yengoh, G. T., & Tom, A. (2017). Seasonal migration and settlement around Lake Chad: Strategies for control of resources in an increasingly drying lake. Resources, 6(4), 41.