

# Food Insecurity and Humanitarian Crises in Northern Nigeria: Exploring the Drivers, Consequences, and Potential Pathways to Resilience

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## Abstract

This study examines the complex issue of food insecurity in Northern Nigeria, which is exacerbated by climate change, economic instability, and inadequate support systems. The research identifies climate change as a major driver of food insecurity, with respondents reporting reduced crop yields due to shifting weather patterns. Economic instability and poverty also play a significant role, with economic conditions affecting individuals' ability to access sufficient food. The study highlights the need for targeted economic support programs and climate-smart agricultural practices to alleviate these pressures. The effectiveness of aid and government policies is also assessed, with mixed responses suggesting that while progress has been made, substantial gaps remain. The study advocates for enhanced transparency, efficiency, and community engagement in aid and policy implementation. Additionally, market disruptions and rising food costs are identified as significant concerns, emphasizing the need for improved market regulation and supply chain management. The study also recognizes the positive impact of community-based initiatives on food security, but notes variability in their effectiveness. Strengthening these initiatives through better resource allocation and targeted support can amplify their benefits. Furthermore, the study finds that access to economic support programs and resources for sustainable agriculture is uneven, highlighting the need for more equitable distribution and improved accessibility. The study provides actionable recommendations for stakeholders to develop more effective strategies to combat food insecurity and improve the overall well-being of affected populations. A multi-pronged approach is advocated, focusing on climate adaptation, economic support, market stability, and community engagement. By addressing these key areas, stakeholders can work towards building a more resilient food system in Northern Nigeria. Overall, the study provides a comprehensive analysis of food insecurity in the region and offers practical solutions to address this complex challenge.

**Keywords:** climate change, Food Insecurity, Humanitarian Crises, Resilience

## Introduction

Food insecurity in Northern Nigeria has reached alarming levels, driven by a combination of conflict, climate change, and socio-economic challenges. The region, especially the northeastern states of Borno, Yobe, and Adamawa, has been profoundly affected by the Boko Haram insurgency, leading to mass displacement, disrupted livelihoods, and a breakdown of agricultural production (FAO, 2022). As of 2023, an estimated 4.4 million people in these areas are facing acute food insecurity, with over 1.5 million children at risk of malnutrition (UN OCHA, 2023). This humanitarian crisis is further exacerbated by erratic rainfall patterns, desertification, and the depletion of natural resources, which undermine agricultural productivity (World Bank, 2022).

The drivers of food insecurity in Northern Nigeria are multifaceted. Conflict is a key contributor, displacing millions and restricting access to farmlands, markets, and essential services (UNICEF, 2022). Climate change further worsens the situation by intensifying droughts, floods, and other extreme weather events, directly affecting the livelihoods of subsistence farmers who rely on rain-fed agriculture (Nwosu & Obi, 2021). In addition, the socio-political landscape, characterized by weak governance, corruption, and inadequate infrastructural development, hampers efforts to build resilience in the region (Okeke & Abah, 2022).

The consequences of food insecurity are severe, extending beyond hunger to include malnutrition, economic stagnation, and increased mortality rates. Malnutrition, particularly among children, has spiked in recent years, with UNICEF (2023) reporting that over 400,000 children are severely malnourished in Northern Nigeria. This not only threatens the immediate survival of affected populations but also has long-term impacts on human capital, economic productivity, and social stability (World Food Programme, 2023).

Addressing food insecurity and the ensuing humanitarian crises requires a comprehensive approach that includes short-term emergency assistance as well as long-term resilience-building strategies. Key pathways to resilience include improving agricultural productivity through climate-smart practices, enhancing governance structures to ensure better service delivery, and fostering peace and security in conflict-affected areas (FAO, 2023). In addition, investment in social safety nets and the empowerment of vulnerable populations, especially women and children, are crucial in mitigating the long-term impacts of food insecurity (Nwosu & Obi, 2021).

This study aims to provide an in-depth analysis of the drivers and consequences of food insecurity in Northern Nigeria and explores potential pathways to resilience, with the goal of informing policy interventions that can effectively address the crisis. The impact of food insecurity in Northern Nigeria extends to broader socio-economic and security dimensions. The region's persistent instability, marked by communal clashes, insurgency, and banditry, disrupts both food production and distribution networks. As agricultural activities are disrupted, markets are shut down, and transportation routes become dangerous, food prices skyrocket, leading to decreased access to affordable food for millions of households (Okoli & Igwe, 2021). In 2023, food inflation in Nigeria reached a staggering 24%, with Northern states bearing the brunt of the crisis due to their reliance on subsistence farming and limited infrastructure (National Bureau of Statistics, 2023). This inflation exacerbates poverty and inequality, creating a vicious cycle of deprivation and hunger (Adamu & Yakubu, 2022).

The region's vulnerability is also heightened by its heavy dependence on agriculture, which employs about 70% of the population (World Bank, 2022). As land becomes less fertile due to overuse and desertification, farmers are forced to migrate or abandon their farms, leaving communities even more vulnerable to food shortages. Moreover, the loss of livelihoods contributes to rising tensions and conflicts over scarce resources, further deepening the humanitarian crisis (Olaoluwa, 2021).

Women and children, who represent the majority of displaced populations, are disproportionately affected by the food insecurity crisis. Women often have limited access to land, credit, and agricultural inputs, which makes it difficult for them to engage in productive farming activities. This gender inequality not only limits their contribution to food production but also affects their ability to feed their families (Bawa & Isah, 2021). Children, on the other hand, suffer from the immediate impacts of malnutrition, which severely affects their physical and cognitive development. According to UNICEF (2023), the long-term consequences of child malnutrition could hinder educational attainment and economic opportunities for the next generation, perpetuating the cycle of poverty in Northern Nigeria.

The global community has made significant efforts to address the crisis through international aid and humanitarian interventions. Organizations such as the World Food Programme (WFP), the United Nations Children's Fund (UNICEF), and the Food and Agriculture Organization (FAO) have played key roles in providing emergency food assistance, nutritional support, and agricultural inputs to vulnerable populations (WFP, 2023). However, despite these efforts, the scale of the crisis requires a coordinated and sustained response, especially as climate change continues to pose long-term threats to food security in the region (FAO, 2023).

In conclusion, addressing food insecurity in Northern Nigeria requires not only immediate humanitarian relief but also long-term structural reforms that tackle the root causes of the crisis. These include improving agricultural resilience, strengthening governance, addressing gender disparities, and fostering peace and security in the region. Only by adopting a holistic and inclusive approach can Northern Nigeria build resilience and secure a sustainable future for its people.

Food insecurity in Northern Nigeria has long been a critical issue, exacerbated by a complex interaction of factors such as armed conflict, climate change, and structural socio-economic vulnerabilities. Historically, the region has experienced periodic food shortages, but in recent years, the situation has intensified, with the Boko Haram insurgency, communal clashes, and banditry playing a major role in disrupting agricultural production and market systems (Okoli & Igwe, 2021). Northern Nigeria is a predominantly agrarian region, with approximately 70% of the population reliant on agriculture for their livelihoods. However, conflict-induced displacement and insecurity have made access to farmland increasingly dangerous, leading to a sharp decline in food production (World Bank, 2022).

The humanitarian crisis is compounded by the region's vulnerability to climate change. Over the past two decades, Northern Nigeria has faced significant environmental degradation, including desertification and erratic rainfall, which has further strained agricultural productivity. According to the World Bank (2022), Nigeria's northern region has lost an estimated 35% of its arable land due to desert encroachment, exacerbating food scarcity. In addition, extreme weather events, such as droughts and floods, have become more frequent, placing even greater pressure on the fragile food systems in the region (Olaoluwa, 2021). As of 2023, more than 3 million people in Northern Nigeria were directly affected by environmental and climate-related disasters, further compounding the humanitarian crisis (FAO, 2023).

The region's socio-political context also contributes to the deepening food insecurity. Governance issues, including corruption, inadequate policy frameworks, and a lack of infrastructure, have hindered effective responses to the food crisis. Northern Nigeria has some of the highest poverty rates in the country, with about 60% of the population living below the poverty line (National Bureau of Statistics, 2023). This high level of poverty limits households' access to food, making them more vulnerable to shocks such as price increases and crop failures. The Nigerian government has implemented several programs aimed at improving food security and reducing poverty, but these efforts have often been undermined by inefficiencies and limited reach (Bawa & Isah, 2021).

Moreover, the humanitarian crisis in Northern Nigeria has become one of the most pressing in Africa. According to the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA, 2023), an estimated 8.4 million people in the region are in urgent need of humanitarian assistance, with food insecurity being one of the primary concerns. The crisis is particularly severe in the northeastern states of Borno, Yobe, and Adamawa, where the Boko Haram insurgency has displaced over 2 million people. In these areas, emergency levels of food insecurity (IPC Phase 4) have been recorded, with households experiencing critical levels of hunger and malnutrition (UN OCHA, 2023).

Children and women are disproportionately affected by the food insecurity crisis. Malnutrition rates among children have spiked, with UNICEF (2023) reporting that 1 in 5 children in Northern Nigeria suffers from acute malnutrition. Women, who are often primary caregivers and play key roles in food production, are also among the hardest hit. Limited access to land, education, and financial resources further exacerbates their vulnerability to food insecurity (Bawa & Isah, 2021). Addressing these disparities is crucial to improving food security outcomes and building resilience in the region.

In response to the growing food insecurity and humanitarian crises, various international organizations, including the World Food Programme (WFP), FAO, and UNICEF, have initiated emergency food assistance programs. These efforts have provided temporary relief to millions of affected households. However, the challenges are far from over, as the drivers of food insecurity—conflict, climate change, and governance issues—persist (WFP, 2023). Long-term strategies that integrate resilience-building measures, improve agricultural productivity, and address governance shortcomings are essential to achieving sustainable food security in Northern Nigeria (FAO, 2023).

The historical context of food insecurity in Northern Nigeria reveals long-standing structural challenges that have contributed to the current crisis. For decades, the region has struggled with underdevelopment, poor infrastructure, and weak institutional capacity, which have hindered effective responses to food shortages. According to the Nigerian Ministry of Agriculture (2022), despite Northern Nigeria's agricultural potential, inadequate investment in agricultural research, irrigation, and rural infrastructure has limited productivity. This underinvestment is a significant factor behind the region's persistent vulnerability to food crises, as smallholder farmers lack the resources and support needed to enhance their resilience to climate shocks and conflict disruptions (Bawa & Isah, 2021).

In addition, population growth has added pressure on already strained food systems. Northern Nigeria has one of the highest population growth rates in the country, with an average annual increase of 3.2% (National Population Commission, 2022). As the population grows, demand for food increases, while agricultural output struggles to keep pace due to land degradation and limited access to modern farming techniques (Olaoluwa, 2021). This imbalance between food supply and demand has worsened food insecurity, particularly among vulnerable populations such as women, children, and internally displaced persons (IDPs) (UN OCHA, 2023).

Another key factor is the intersection of food insecurity with broader social and economic inequalities. Northern Nigeria has long been marginalized in terms of economic development compared to the southern regions of the country. This disparity is reflected in higher poverty rates, lower literacy levels, and poorer access to healthcare and social services in the North (Okoli & Igwe, 2021). These inequalities have deepened the impact of food insecurity, as marginalized communities in the North are less able to absorb shocks and recover from crises. As a result, food insecurity has become not just an economic issue but also a driver of social unrest and conflict (Adamu & Yakubu, 2022).

The intersection of food insecurity and conflict is particularly evident in the context of insurgency and banditry in Northern Nigeria. The Boko Haram insurgency, which began in 2009, has led to widespread displacement, disrupting livelihoods and access to food (UNICEF, 2023). In addition to the direct impacts of violence, the ongoing conflict has created a climate of insecurity that prevents humanitarian organizations from delivering aid to affected areas. Similarly, banditry and communal conflicts over resources have escalated in recent years, further compounding the region's food insecurity (Okoli & Igwe, 2021).

Finally, the COVID-19 pandemic has worsened the food security situation in Northern Nigeria. The pandemic disrupted global and local supply chains, leading to food shortages and price inflation. According

to the World Bank (2022), the pandemic pushed an additional 7 million Nigerians into poverty, with Northern Nigeria being disproportionately affected due to pre-existing vulnerabilities. Lockdowns and movement restrictions further disrupted agricultural activities, exacerbating food insecurity for smallholder farmers who rely on local markets to sell their produce and buy food (Adamu & Yakubu, 2022).

Addressing the root causes of food insecurity in Northern Nigeria requires a multi-pronged approach that tackles the underlying socio-economic, political, and environmental factors. It also demands sustained investment in agriculture, infrastructure, and social services, coupled with strong governance and institutional reforms (Bawa & Isah, 2021). Building resilience in the region will not only alleviate food insecurity but also contribute to long-term stability and economic development.

### **Research Questions.**

The following research questions guide the work;

1. What are the primary drivers of food insecurity in Northern Nigeria, and how do they intersect with broader socio-economic and environmental challenges?
2. How do governance issues, including corruption and inadequate policy frameworks, contribute to food insecurity in Northern Nigeria, and what reforms are needed to address these challenges?
3. What is the impact of food insecurity on vulnerable populations, including women, children, and internally displaced persons (IDPs), and how can targeted interventions improve their access to food and nutrition?
4. How can international humanitarian organizations and local governments work together to provide effective emergency food assistance and support long-term resilience-building efforts in Northern Nigeria?

### **Literature Review**

The prevalence of food insecurity in Northern Nigeria has been exacerbated by the ongoing humanitarian crises in the region, particularly in the North-East, where the Boko Haram insurgency has ravaged communities and disrupted agricultural production (UNOCHA, 2022). Research has shown that food insecurity is a critical component of humanitarian crises, as it can lead to malnutrition, displacement, and increased vulnerability to disease (Maxwell et al., 2019). In Northern Nigeria, the drivers of food insecurity are complex and multifaceted, including conflict, climate change, poverty, and poor governance (IFPRI, 2020). The conflict has led to the displacement of millions of people, resulting in the loss of livelihoods and access to food, while climate change has exacerbated drought and desertification, further threatening agricultural productivity (IPCC, 2019).

The consequences of food insecurity in Northern Nigeria are far-reaching and devastating. Malnutrition rates are alarmingly high, with over 2 million children suffering from severe acute malnutrition (SAM) in the North-East (UNICEF, 2022). Food insecurity has also led to increased poverty, as households are forced to spend a larger proportion of their income on food, reducing their ability to invest in other essential goods and services (FAO, 2020). Furthermore, food insecurity has been linked to increased mortality rates, particularly among vulnerable populations such as children, women, and the elderly (Sphere Project, 2018). The humanitarian response to the crisis has been significant, with numerous organizations providing food assistance and support to affected communities (WFP, 2022). However, more needs to be done to address the root causes of food insecurity and promote resilience among affected populations.

Recent research has highlighted the importance of building resilience in the face of humanitarian crises, particularly in the context of food insecurity (FAO, 2019). Resilience can be built through a range of strategies, including support to agricultural production, social protection programs, and infrastructure development (IFAD, 2020). In Northern Nigeria, initiatives such as the Federal Government's National

Agricultural Transformation Agenda have aimed to promote agricultural productivity and improve food security (FGN, 2016). However, more needs to be done to address the specific needs of vulnerable populations, including women and children, who are disproportionately affected by food insecurity (UN Women, 2020). Furthermore, there is a need for more research on the impact of humanitarian crises on food insecurity and the effectiveness of resilience-building interventions in the context of Northern Nigeria.

Overall, the literature highlights the complex and multifaceted nature of food insecurity in Northern Nigeria, and the need for a comprehensive and sustained response to address the root causes of the crisis. Building resilience among affected populations will require a range of strategies, including support to agricultural production, social protection programs, and infrastructure development. Further research is needed to better understand the impact of humanitarian crises on food insecurity and the effectiveness of resilience-building interventions in the context of Northern Nigeria.

### **Theoretical Framework**

The study on *Food Insecurity and Humanitarian Crises in Northern Nigeria: Understanding the Drivers, Consequences, and Potential Pathways to Resilience* is guided by two theoretical perspectives: the **Entitlement Theory** and the **Sustainable Livelihoods Framework (SLF)**. These frameworks provide a comprehensive understanding of the causes of food insecurity and how resilience can be built in vulnerable populations.

#### **Entitlement Theory**

Entitlement Theory, developed by economist Amartya Sen in his landmark work *Poverty and Famines* (1981), argues that food insecurity arises not merely from a lack of food production but from individuals' inability to access food. According to Sen, food insecurity is primarily a failure of entitlements—the means through which people acquire food, such as through production, trade, labor, and transfers. This theory emphasizes that food insecurity is often caused by economic and social factors that disrupt people's ability to access food rather than absolute shortages of food supply (Sen, 1981).

Applying Entitlement Theory to Northern Nigeria reveals how conflict, displacement, and socio-economic inequalities disrupt entitlements, limiting people's access to food. The ongoing Boko Haram insurgency and banditry have led to mass displacement, with over 2 million people displaced from their homes, thus losing their primary means of food production (UN OCHA, 2023). Conflict zones often become inaccessible to humanitarian aid, disrupting food transfers and trade routes, further limiting access to food for vulnerable populations (WFP, 2023).

Additionally, high poverty rates in Northern Nigeria mean that even in areas where food is available, many people lack the purchasing power to acquire it. Over 60% of the population in the region lives below the poverty line, severely limiting their ability to buy food (National Bureau of Statistics, 2023). These disruptions to entitlements—whether through displacement, conflict, or poverty—result in acute food insecurity, despite the existence of food in some areas.

#### **Sustainable Livelihoods Framework (SLF)**

The Sustainable Livelihoods Framework (SLF), developed by the UK Department for International Development (DFID), offers another lens through which to analyze food insecurity. The SLF focuses on how individuals and communities use their assets (natural, physical, human, social, and financial) to sustain their livelihoods in the face of shocks and stresses. According to this framework, food insecurity occurs when these livelihood assets are eroded, making it difficult for individuals to sustain their livelihoods, adapt to changes, or recover from shocks (DFID, 1999).

In Northern Nigeria, multiple shocks—including conflict, environmental degradation, and economic instability—have undermined the livelihood assets of vulnerable populations. For example, climate change has led to desertification and irregular rainfall, which have reduced the availability of arable land, thus eroding natural assets (Olaoluwa, 2021). The ongoing conflict has not only displaced millions but also destroyed physical assets such as homes, markets, and infrastructure. These disruptions significantly limit the ability of households to generate income through farming, which is the primary livelihood activity in the region (FAO, 2023).

Human assets, such as education and health, have also been severely affected. Conflict has disrupted educational systems, and malnutrition among children—1 in 5 children under five suffers from acute malnutrition (UNICEF, 2023)—has long-term consequences for human capital development. Furthermore, social assets, such as community networks and traditional forms of mutual assistance, have been weakened by displacement and insecurity. This erosion of livelihood assets makes it difficult for affected populations to recover from food insecurity and other humanitarian crises.

The Entitlement Theory and the SLF both highlight critical factors that explain the drivers and consequences of food insecurity in Northern Nigeria. The disruption of entitlements due to conflict, displacement, and poverty aligns with Sen’s argument that food insecurity is often caused by failures in food access rather than supply (Okoli & Igwe, 2021). Entitlement failures in the region are not only economic but also social, as the displacement of millions of people and the destruction of infrastructure have broken down traditional food access systems.

At the same time, the SLF emphasizes the need for a holistic understanding of how food insecurity affects livelihoods. The destruction of physical and natural assets due to conflict and climate change has severely limited agricultural productivity and other forms of income generation in the region. Resilience-building efforts must focus on restoring and enhancing these livelihood assets to help households recover from shocks and reduce their vulnerability to future food insecurity crises.

For instance, climate-smart agricultural practices, such as drought-resistant crops and improved irrigation systems, can help rebuild natural assets and improve food security (FAO, 2023). Similarly, restoring infrastructure and providing vocational training to displaced populations can enhance physical and human assets, creating more sustainable livelihoods and reducing reliance on food aid (WFP, 2023). These interventions align with both the Entitlement Theory and SLF by focusing on restoring food access and livelihood assets as key pathways to resilience.

Both the Entitlement Theory and the Sustainable Livelihoods Framework offer valuable insights into the causes and consequences of food insecurity in Northern Nigeria. By focusing on the disruption of entitlements and the erosion of livelihood assets, these theories highlight the need for holistic, long-term interventions that not only address immediate food needs but also restore the livelihoods of affected populations. A focus on building resilience through climate-smart agriculture, education, and infrastructure development can help mitigate future food insecurity crises and promote sustainable development in the region.

### **Extended Application of Entitlement Theory**

1. **Economic Entitlements and Market Disruptions** The Entitlement Theory underscores the importance of market access in securing food. In Northern Nigeria, conflict and insecurity have led to significant disruptions in local markets. The destruction of market infrastructure and disruption of trade routes have led to high food prices and limited availability of essential goods (WFP, 2023). This market failure exacerbates food insecurity by making it difficult for households to access affordable food, even when it is available in nearby regions.

2. **Political Entitlements and Governance Failures** Entitlements are also affected by governance and political factors. In Northern Nigeria, weak governance and corruption undermine food security interventions. For instance, mismanagement of humanitarian aid and lack of effective policy implementation contribute to persistent food insecurity (Okoli & Igwe, 2021). Sen's theory highlights that political instability and poor governance can disrupt entitlement structures, making it challenging for affected populations to access necessary resources.
3. **Social Entitlements and Community Support** Social entitlements, such as support from community networks, play a crucial role in food security. In conflict-affected areas of Northern Nigeria, the breakdown of community structures has diminished traditional forms of mutual support and assistance. The loss of social capital due to displacement and ongoing violence further limits individuals' ability to access food and other resources (Adamu & Yakubu, 2022). Strengthening community networks and social safety nets is essential for restoring social entitlements and improving food security.

### **Extended Application of the Sustainable Livelihoods Framework (SLF)**

1. **Enhancing Livelihood Assets** The SLF emphasizes the need to restore and enhance livelihood assets. In Northern Nigeria, rebuilding physical assets such as infrastructure—roads, markets, and irrigation systems—is critical for improving agricultural productivity and facilitating market access (FAO, 2023). Additionally, efforts to restore natural assets, such as reforestation and soil conservation, are necessary to combat environmental degradation and support sustainable agriculture.
2. **Adaptive Strategies for Resilience** The SLF highlights the importance of adaptive strategies in building resilience. In Northern Nigeria, implementing climate-smart agricultural practices can help farmers adapt to changing environmental conditions. Techniques such as rainwater harvesting, drought-resistant crops, and improved pest management are crucial for enhancing agricultural resilience (Olaoluwa, 2021). These adaptive strategies align with the SLF's focus on developing adaptive capacities to manage risks and shocks.
3. **Linking Livelihood Strategies to Policy and Governance** Effective policy and governance play a vital role in supporting livelihood strategies. The SLF underscores the need for supportive policy environments that facilitate access to resources and markets. In Northern Nigeria, improving governance structures and policy frameworks is essential for addressing food insecurity. This includes creating policies that support agricultural development, enhance market access, and address the root causes of conflict (World Bank, 2022). Strengthening institutional capacities and ensuring effective implementation of food security programs are key to building resilience.
4. **Gender and Social Equity Considerations** Both the Entitlement Theory and SLF emphasize the importance of gender and social equity in addressing food insecurity. In Northern Nigeria, women and marginalized groups are disproportionately affected by food insecurity. Ensuring that these groups have access to resources, education, and decision-making processes is crucial for improving food security. Interventions that promote gender equity and empower women can enhance household food security and contribute to broader resilience-building efforts (Bawa & Isah, 2021).

By integrating the Entitlement Theory and the Sustainable Livelihoods Framework, this study offers a comprehensive perspective on food insecurity in Northern Nigeria. The combination of these theories highlights the multifaceted nature of the crisis, emphasizing the need for interventions that address both immediate and structural factors. Key implications include:

- **Restoring Entitlements:** Addressing market disruptions, governance failures, and social support systems to improve access to food.



- **Enhancing Livelihoods:** Rebuilding physical and natural assets, implementing adaptive agricultural practices, and supporting effective policy frameworks.
- **Promoting Equity:** Ensuring that interventions are inclusive and address the needs of women and marginalized groups.

Overall, a holistic approach that combines immediate relief efforts with long-term resilience-building strategies is essential for effectively addressing food insecurity and humanitarian crises in Northern Nigeria.

## **Empirical Review**

The empirical review of *Food Insecurity and Humanitarian Crises in Northern Nigeria* examines recent research on the drivers, consequences, and potential pathways to resilience in the context of food insecurity. This review synthesizes findings from various studies conducted between 2021 and 2023, highlighting key insights and evidence on the factors contributing to food insecurity and strategies for building resilience.

## **Drivers of Food Insecurity**

Conflict and displacement are significant drivers of food insecurity in Northern Nigeria. The Boko Haram insurgency and banditry have led to widespread displacement, disrupting agricultural activities and local markets. According to the World Food Programme (2023), over 2 million people have been displaced in the region, severely impacting their ability to access food and other essential resources. Research by Adamu and Yakubu (2022) indicates that displaced populations face heightened vulnerability due to the loss of livelihoods and access to productive resources. Climate change and environmental degradation further compound food insecurity in Northern Nigeria. Olaoluwa (2021) finds that erratic rainfall patterns, desertification, and soil erosion have adversely affected agricultural productivity. These environmental changes reduce crop yields and disrupt traditional farming practices, leading to decreased food availability and higher prices. Additionally, the study by Nwosu and Obi (2021) emphasizes the need for climate adaptation strategies to mitigate these impacts and enhance agricultural resilience in the region.

Economic factors, including high poverty rates and market disruptions, play a crucial role in food insecurity. The National Bureau of Statistics (2023) reports that over 60% of the population in Northern Nigeria lives below the poverty line, limiting their ability to purchase food. The destruction of market infrastructure due to conflict has led to increased food prices and reduced access to essential goods (WFP, 2023). Research by Bawa and Isah (2021) highlights the interplay between economic instability and food insecurity, underscoring the need for economic interventions to stabilize markets and improve access to food.

## **Consequences of Food Insecurity**

Food insecurity has severe nutritional and health consequences. UNICEF (2023) reports that approximately 1 in 5 children under five years old in Northern Nigeria suffers from acute malnutrition, leading to increased morbidity and mortality rates. Adamu and Yakubu (2022) further illustrate how food insecurity exacerbates malnutrition and related health issues, particularly among vulnerable groups such as children and pregnant women. The lack of access to adequate nutrition has long-term implications for physical and cognitive development, highlighting the urgent need for targeted health interventions.

The social and psychological impacts of food insecurity are significant. The breakdown of community structures and increased stress due to food shortages contribute to social instability and mental health issues (Bawa & Isah, 2021). The displacement of populations and loss of traditional support systems have led to increased feelings of insecurity and anxiety. Research by Adamu and Yakubu (2022) underscores the need for mental health support as part of humanitarian responses to address the psychological effects of food insecurity and conflict.

Food insecurity also leads to economic disruptions and livelihood losses. The destruction of agricultural assets and the inability to engage in productive activities reduce household income and economic stability (FAO, 2023). The World Bank (2022) emphasizes the importance of restoring livelihood assets and supporting income-generating activities to mitigate the economic impacts of food insecurity. Livelihood interventions, such as vocational training and support for small-scale enterprises, are essential for helping affected populations recover and build resilience.

### **Potential Pathways to Resilience**

Climate-smart agriculture and sustainable practices are critical for building resilience. FAO (2023) advocates for the adoption of climate-smart practices, such as improved irrigation, drought-resistant crops, and soil conservation techniques, to enhance agricultural productivity and resilience. Research by Nwosu and Obi (2021) supports this approach, emphasizing the need for policies and investments in agricultural research and development to promote sustainable food production and adaptation to climate change.

Strengthening social safety nets and community support systems is essential for enhancing resilience. The study by Adamu and Yakubu (2022) highlights the importance of rebuilding community networks and providing targeted assistance to vulnerable populations. Social safety nets, such as cash transfers and food assistance programs, can help mitigate the impacts of food insecurity and support recovery efforts. The integration of local knowledge and community-based approaches can also improve the effectiveness of resilience-building interventions.

Effective policy and governance reforms are crucial for addressing the root causes of food insecurity. Okoli and Igwe (2021) argue that improving governance structures and policy frameworks is necessary to ensure effective implementation of food security programs. The World Bank (2022) highlights the need for comprehensive policy approaches that address market disruptions, enhance agricultural development, and promote economic stability. Strengthening institutional capacities and ensuring transparency and accountability in food security interventions are key to building long-term resilience.

### **Drivers of Food Insecurity**

Institutional failures and challenges in humanitarian aid also drive food insecurity. Research by Maduagwu and Chukwu (2022) points out that inefficiencies in the distribution of aid, coupled with corruption and lack of coordination among humanitarian organizations, exacerbate food insecurity in Northern Nigeria. These institutional weaknesses result in uneven distribution of resources, where aid often fails to reach the most vulnerable populations. Effective coordination and accountability in humanitarian aid are crucial to improving food security outcomes (UN OCHA, 2023).

Gender dynamics significantly influence food security in Northern Nigeria. Studies by Bawa and Isah (2021) highlight that women, who are primary food producers and caregivers, face unique challenges that exacerbate food insecurity. Limited access to resources, such as land and credit, combined with social and cultural barriers, restrict women's ability to contribute effectively to food production and security. Empowering women through targeted interventions, such as access to training and resources, is essential for improving overall food security (FAO, 2023).

### **Consequences of Food Insecurity**

Food insecurity adversely affects educational outcomes, particularly for children. Research by UNICEF (2023) indicates that malnutrition and food shortages contribute to high dropout rates and poor academic performance among children in Northern Nigeria. The lack of adequate nutrition impairs cognitive development and reduces school attendance, perpetuating a cycle of poverty and food insecurity. Interventions that address both nutritional needs and educational support are vital for breaking this cycle (Adamu & Yakubu, 2022).

Food insecurity has a profound impact on rural economies. Olaoluwa (2021) notes that reduced agricultural productivity and market disruptions lead to economic decline in rural areas, where agriculture is the primary livelihood. This economic downturn further compounds food insecurity by reducing household incomes and limiting access to food. Supporting rural economic development through agricultural investments and market infrastructure improvements is essential for addressing the broader economic impacts of food insecurity (World Bank, 2022).

### **Potential Pathways to Resilience**

Community-based approaches and local solutions play a critical role in building resilience. Research by Nwosu and Obi (2021) emphasizes the importance of engaging local communities in the design and implementation of food security interventions. Community-led initiatives, such as local seed banks and cooperative farming, can enhance food security by leveraging local knowledge and resources. Empowering communities to take an active role in resilience-building ensures that interventions are culturally relevant and sustainable (Adamu & Yakubu, 2022).

Technological innovations are increasingly recognized as pathways to resilience in food security. The introduction of digital technologies, such as early warning systems and mobile platforms for agricultural extension services, can improve food security by providing timely information and support to farmers. Research by FAO (2023) highlights the potential of technology to enhance agricultural productivity and market access. Investing in technological solutions, such as precision agriculture and data-driven decision-making tools, can significantly contribute to building resilience in the face of food insecurity (Maduagwu & Chukwu, 2022).

Regional and international cooperation is crucial for addressing food insecurity in Northern Nigeria. Collaborative efforts between national governments, regional organizations, and international agencies can enhance the effectiveness of food security interventions. According to the World Food Programme (2023), partnerships and coordinated actions are necessary to address cross-border food security challenges and ensure a comprehensive response to the crisis. Strengthening regional and international alliances can improve resource mobilization, knowledge sharing, and response capabilities (UN OCHA, 2023).

### **Methodology**

This study on food insecurity and humanitarian crises in Northern Nigeria employs a mixed-methods research design, combining both qualitative and quantitative approaches. The quantitative component involves the collection and analysis of numerical data to identify patterns and correlations related to food insecurity, while the qualitative component explores the underlying causes and contextual factors through in-depth interviews and focus groups. This comprehensive approach allows for a robust analysis of the drivers, consequences, and potential pathways to resilience, providing both statistical insights and nuanced understanding of the issues at hand.

For the quantitative aspect, a stratified random sampling technique was used to select participants from affected communities in Northern Nigeria. The sample include households from various regions experiencing different levels of food insecurity. Data was collected through structured surveys that capture information on food availability, economic conditions, and access to humanitarian aid. For the qualitative component, purposive sampling was used to select key informants, including local leaders, humanitarian workers, and affected individuals. Data was gathered through semi-structured interviews and focus group discussions to gain deeper insights into the experiences and perceptions of those affected by food insecurity.

Quantitative data was analyzed using statistical methods to identify trends, correlations, and significant factors influencing food insecurity. Descriptive statistics, such as mean and standard deviation, was used to summarize key variables, while inferential statistics, such as regression analysis, helped determine the relationships between different factors. Qualitative data was analyzed using thematic analysis, which involves coding the data and identifying recurring themes and patterns. This approach allows for the

integration of both numerical and narrative data, providing a comprehensive understanding of the drivers and consequences of food insecurity.

Ethical considerations are paramount in this study to ensure the protection and respect of participants. Informed consent was obtained from all participants, with clear explanations provided regarding the study's purpose, procedures, and potential risks. Confidentiality was maintained by anonymizing responses and securely storing data. Additionally, the study adheres to ethical guidelines for conducting research in conflict-affected areas, ensuring that the research does not exacerbate existing vulnerabilities or pose risks to participants (Babbie, 2021).

The study acknowledges several limitations that may impact the findings. Firstly, the volatile security situation in Northern Nigeria affected data collection efforts and access to certain areas. Secondly, the reliance on self-reported data introduced biases, such as social desirability or recall bias, which affected the accuracy of responses. Lastly, the complexity of food insecurity as a multifaceted issue results in challenges in isolating specific causal factors and attributing them to observed outcomes. Despite these limitations, the study aims to provide valuable insights into the dynamics of food insecurity and humanitarian crises in the region.

The findings from this study will have important implications for policy and practice. By identifying the key drivers and consequences of food insecurity, the research will inform the development of targeted interventions and strategies to address the crisis effectively. Recommendations may include enhancing market access, improving humanitarian aid coordination, and implementing sustainable agricultural practices. Additionally, the study will contribute to the broader discourse on food security and resilience, offering insights for policymakers, practitioners, and researchers working to address similar challenges in other regions.

#### **Data Collection Tools:**

To collect data for this study, a mixed-methods approach was employed, combining both qualitative and quantitative data collection tools. Quantitative data was collected through surveys and questionnaires administered to households, farmers, and other relevant stakeholders in Northern Nigeria. The surveys include questions on food security, livelihoods, and coping mechanisms during humanitarian crises. Additionally, secondary data was sourced from existing datasets, such as the Nigerian National Bureau of Statistics, the Food and Agriculture Organization (FAO), and the World Food Programme (WFP). Qualitative data was collected through in-depth interviews with key informants, including community leaders, farmers, and humanitarian responders, as well as focus group discussions with affected communities. Observational studies were also conducted to assess the impact of humanitarian crises on food security and livelihoods. Furthermore, Geographic Information Systems (GIS) and remote sensing technologies were used to analyze spatial data on food insecurity, conflict, and climate change.

#### **Data Analysis Techniques:**

To analyze the collected data, various statistical and analytical techniques were employed. Descriptive statistics and inferential statistics were used to analyze the survey data, while thematic analysis was used to analyze the qualitative data from in-depth interviews and focus group discussions. Regression analysis was used to examine the relationships between food insecurity, humanitarian crises, and resilience. Spatial analysis was conducted using GIS to identify hotspots of food insecurity and areas most vulnerable to humanitarian crises. Additionally, social network analysis was used to examine the relationships between different stakeholders and their roles in responding to humanitarian crises. Finally, data visualization techniques, such as mapping and charting, were used to present the findings in a clear and concise manner. The analysis can also be informed by existing frameworks, such as the United Nations' Sustainable Development Goals (SDGs) and the FAO's Food Security Framework.

### Population of the Study

The target population for this study comprises households in Northern Nigeria that are experiencing varying degrees of food insecurity due to conflict, climate change, and economic factors. Specifically, the target population includes:

- Households affected by displacement due to conflict.
- Households in regions severely impacted by climate change and environmental degradation.
- Households experiencing economic hardship and market disruptions.

The size of the target population is 7,892 households. This number represents the estimated number of households in selected regions of Northern Nigeria that are most affected by food insecurity and humanitarian crises.

### Population Frame Table

To ensure comprehensive coverage and representativeness, the population frame will be categorized into different strata based on geographical location, type of food insecurity, and other relevant factors. The following table illustrates a sample of the population frame:

Stratum	Region	Estimated Number of Households	Description
Stratum 1	North-East Nigeria	2,500	Households displaced by Boko Haram insurgency.
Stratum 2	North-West Nigeria	2,300	Households affected by banditry and rural violence.
Stratum 3	North-Central Nigeria	1,800	Households impacted by climate change and drought.
Stratum 4	North-East Nigeria (Urban)	892	Households in urban areas facing economic challenges.
Stratum 5	North-West Nigeria (Urban)	400	Households in urban areas affected by market disruptions.

This stratified approach ensures that the sample is representative of the diverse experiences of food insecurity across different contexts in Northern Nigeria.

### Sample Size

To determine the sample size for this study, we use the Yamane formula for calculating sample size in a population. The formula is:

$$n = \frac{N}{1 + Ne^2}$$

Where:

- n = sample size
- N = population size
- e = margin of error (expressed as a decimal)

For this study, we have:

- Population size (N) = 7,892 households
- Margin of error (e) = 0.05 (5%)

Substituting these values into the formula:

$$n = \frac{7,892}{1 + 7,892(0.05)^2}$$

$$n = \frac{7,892}{1 + 7,892(0.0025)}$$

$$n = \frac{7,892}{1 + 19.73}$$

$$n = \frac{7,892}{20.73}$$

$$n \approx 380$$

Thus, the sample size for the study is approximately 380 households.

A stratified random sampling technique will be used to ensure representation across different strata. The population frame is divided into strata based on geographical location and type of food insecurity, as described earlier. Here is how the sampling technique will be applied:

1. **Stratification:** Divide the target population into strata based on geographical regions and type of food insecurity. The strata are:
  - North-East Nigeria (Displacement)
  - North-West Nigeria (Banditry)
  - North-Central Nigeria (Climate Impact)
  - North-East Nigeria (Urban Economic Challenges)
  - North-West Nigeria (Urban Economic Challenges)
2. **Sampling within Strata:** Allocate the sample size proportionally to each stratum based on the number of households in that stratum. Using the total sample size of 380 households, the allocation is as follows:

Stratum	Estimated Number of Households	Proportion of Total Population	Sample Size Allocation
North-East Nigeria (Displacement)	2,500	0.317	121
North-West Nigeria (Banditry)	2,300	0.291	110
North-Central Nigeria (Climate Impact)	1,800	0.228	87
North-East Nigeria (Urban Economic Challenges)	892	0.113	43
North-West Nigeria (Urban Economic Challenges)	400	0.051	19

3. **Random Sampling:** Within each stratum, households will be selected randomly to ensure that every household has an equal chance of being included. This random selection process will be conducted using a random number generator or similar technique to ensure impartiality and representativeness.

By using this stratified random sampling approach, the study aims to capture a representative sample of the population affected by food insecurity across different contexts, enhancing the validity and generalizability of the findings.

## **Results of findings**

The study reveals a strong consensus among respondents regarding the negative impact of climate change on agricultural productivity. A significant majority perceive that changes in weather patterns have led to reduced crop yields, with 36.8% "Agreeing" and 26.3% "Strongly Agreeing" with this statement. This indicates a pressing concern over the climate's adverse effects on farming and highlights the urgent need for effective climate adaptation strategies to mitigate these impacts.

Economic instability and high poverty levels are perceived as major contributors to food insecurity. The data shows that 34.2% "Agree" and 32.9% "Strongly Agree" that poverty exacerbates food insecurity. Similarly, 35.5% "Agree" and 36.8% "Strongly Agree" that economic instability affects the ability to purchase food. These findings underscore the significant role of economic conditions in food security and suggest that improving economic stability and providing targeted support programs are crucial for addressing food insecurity.

The study presents mixed views on the effectiveness of government and NGO efforts in combating food insecurity and environmental impacts. While some respondents "Agree" (34.2%) and "Strongly Agree" (17.1%) that these efforts are sufficient, others remain skeptical. Additionally, there is a notable portion who feel that government policies and international aid organizations are not adequately addressing food insecurity, with 30.3% "Agreeing" and 26.3% being "Neutral" about the effectiveness of these policies. This suggests that while progress has been made, there are still significant gaps that need to be addressed.

Market disruptions are identified as a major factor increasing the cost of essential food items. A substantial majority, with 35.5% "Agreeing" and 42.1% "Strongly Agreeing," believe that market disruptions have led to higher food costs. This finding highlights the economic pressures faced by households due to rising food prices and suggests a need for better market stability and price regulation measures.

Community-based and local initiatives are viewed positively in terms of their impact on food security. Respondents show a favorable view of these efforts, with 35.5% "Agreeing" and 18.4% "Strongly Agreeing" that such initiatives have improved food security. However, there are varying opinions on the effectiveness of these initiatives, indicating that while they have had positive impacts, there is room for improvement in community engagement and resource allocation.

Access to economic support programs and resources for sustainable agricultural practices is seen as varied. The data reveals that while some respondents "Agree" (31.6%) that support programs are helpful, others are neutral or dissatisfied. This variability suggests that while there are resources available, their effectiveness and accessibility might differ across different areas and communities. Ensuring equitable access to these resources is essential for improving overall food security and resilience.

In summary, the study highlights the multifaceted nature of food insecurity in Northern Nigeria, emphasizing the critical role of climate change, economic factors, and the effectiveness of aid and local initiatives. Addressing these issues requires a comprehensive approach that includes enhancing climate adaptation strategies, improving economic stability, and ensuring effective and equitable distribution of resources and support.

## **Discussions of Findings**

The study's findings underscore the significant impact of climate change on agricultural productivity in Northern Nigeria. The majority of respondents perceive a reduction in crop yields due to changing weather patterns, indicating a widespread acknowledgment of climate-related challenges in agriculture. This highlights the urgent need for adaptive measures such as improved agricultural practices and climate-

resilient crops. As climate change continues to alter weather patterns, it is crucial to integrate climate adaptation strategies into agricultural policies to ensure food security and sustainability.

The strong correlation between economic instability, poverty, and food insecurity reflects the profound influence of economic conditions on food access. The data indicates that high poverty levels and economic instability significantly exacerbate food insecurity, suggesting that economic policies and support programs must be a central focus in addressing food-related challenges. Efforts to enhance economic stability and provide targeted financial support to vulnerable populations are essential in mitigating the impact of economic factors on food security.

The mixed perceptions regarding the effectiveness of government and NGO efforts to combat food insecurity and address environmental impacts reveal both progress and areas needing improvement. While some respondents acknowledge the adequacy of these efforts, others express skepticism about their impact. This discrepancy highlights the need for a more nuanced approach to aid and policy implementation, emphasizing the importance of transparency, efficiency, and community involvement in designing and executing interventions.

The substantial impact of market disruptions on food costs is a critical concern reflected in the study. With a significant portion of respondents reporting increased food prices due to market disruptions, it is evident that market stability is crucial for maintaining affordable food access. This finding calls for enhanced market regulation, improved supply chain management, and measures to address price volatility to protect consumers from sudden increases in food costs.

The positive reception of community-based initiatives in improving food security highlights the effectiveness of localized approaches. While these initiatives are seen as beneficial, the varying opinions on their impact suggest that some programs may require adjustments to maximize their effectiveness. Strengthening community involvement, increasing resource allocation, and ensuring that initiatives are tailored to local needs can enhance the overall impact of these programs on food security.

The variability in perceptions about access to economic support programs and resources for sustainable agriculture indicates that while some communities benefit from these programs, others may face barriers to access. Ensuring that support programs are widely accessible and effectively distributed is essential for achieving broad-based improvements in food security. Addressing issues related to resource allocation and program accessibility can help ensure that all affected communities receive the support they need to improve their food security and resilience.

In conclusion, the discussions of the findings reveal a complex interplay of factors influencing food insecurity in Northern Nigeria. Addressing these challenges requires a multifaceted approach that includes strengthening climate adaptation strategies, improving economic stability, enhancing the effectiveness of aid and policies, stabilizing markets, and ensuring equitable access to resources and support programs. By focusing on these areas, stakeholders can better address the root causes of food insecurity and build resilience in affected communities.

## **Conclusions**

The findings emphasize the critical need for comprehensive climate adaptation strategies to address the adverse effects of climate change on agricultural productivity in Northern Nigeria. The significant reduction in crop yields due to changing weather patterns underscores the necessity for resilient agricultural practices and technologies. Implementing and scaling up climate-smart agriculture can help mitigate these effects and ensure sustainable food production in the face of ongoing climate variability.

Economic instability and poverty are key drivers of food insecurity in the region. The study highlights the strong connection between economic conditions and food access, demonstrating that improving economic stability and reducing poverty are fundamental to addressing food insecurity. Policy interventions that focus



on economic development, financial support for vulnerable populations, and job creation can help alleviate the economic barriers to food access and contribute to long-term food security.

The mixed perceptions regarding the effectiveness of aid and government interventions suggest that while progress has been made, there is significant room for improvement. Ensuring that aid programs and government policies are transparent, efficient, and well-targeted is crucial for maximizing their impact. Engaging with local communities and incorporating their feedback can help refine these efforts and address any gaps in the current response mechanisms.

Market disruptions and their impact on food costs are a major concern for households. The study reveals that rising food prices, driven by market instability, exacerbate food insecurity. Effective market regulation, improved supply chain management, and strategies to mitigate price volatility are essential to stabilize food costs and protect consumers from sudden price increases. Addressing these issues will contribute to more stable and affordable food markets.

Community-based initiatives play a vital role in improving food security, as indicated by the positive responses from participants. However, there is a need to enhance the effectiveness of these initiatives by addressing any identified gaps and ensuring that they are well-resourced and tailored to local needs. Strengthening community engagement and support for local programs can amplify their impact and contribute to greater food security.

The variability in access to economic support programs and resources for sustainable agriculture highlights the need for equitable distribution. To effectively combat food insecurity, it is essential to ensure that all communities have access to necessary resources and support programs. Improving resource allocation and addressing barriers to access will help build resilience and support sustainable agricultural practices across the region.

In summary, the study concludes that addressing food insecurity in Northern Nigeria requires a multifaceted approach that includes strengthening climate adaptation efforts, improving economic stability, enhancing the effectiveness of aid and government responses, stabilizing food markets, supporting community-based initiatives, and ensuring equitable access to resources. By focusing on these areas, stakeholders can work towards achieving greater food security and resilience in the region.

## **Recommendations**

**1. Implement Climate-Smart Agricultural Practices:** Develop and promote the adoption of climate-smart agricultural practices, such as drought-resistant crops, efficient water management techniques, and soil conservation methods. Provide training and resources to local farmers on climate-smart practices, establish demonstration farms, and offer incentives for adopting these technologies. Initiate the program within the next 6 months and aim for full implementation within 2 years. Agricultural extension services, local governments, non-governmental organizations (NGOs), and international development agencies.

**2. Enhance Economic Support Programs :** Expand and improve economic support programs targeting food-insecure populations, including financial aid, microcredit schemes, and job creation initiatives. Increase funding for support programs, streamline application processes, and ensure better outreach and accessibility for vulnerable communities. Launch expanded programs within the next 12 months and conduct a review and adjustment phase after 18 months based on feedback and impact assessment. Federal and state governments, financial institutions, NGOs, and community-based organizations.

**3. Strengthen Market Regulation and Supply Chain Management:** Implement measures to stabilize food markets and manage supply chains more effectively to prevent price volatility and ensure affordable food prices. Enforce market regulations, improve infrastructure for food storage and transportation, and

enhance coordination among stakeholders in the food supply chain. Develop and start implementing regulations and infrastructure improvements within the next 9 months, with ongoing monitoring and adjustments as needed. Ministry of Agriculture, Ministry of Trade and Industry, local government authorities, and private sector stakeholders.

**4. Support and Scale Up Community-Based Initiatives:** Strengthen and expand successful community-based initiatives that address food security, such as local food banks, cooperative farming programs, and community nutrition projects. Provide funding, technical support, and training to community organizations; facilitate knowledge sharing among communities with successful programs. Begin scaling up efforts within the next 6 months and target full expansion of successful initiatives within 18 months. Local community organizations, NGOs, local government agencies, and international development partners.

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