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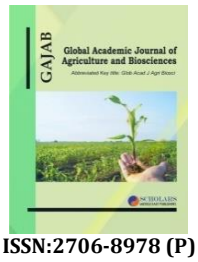

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Original Research Article

Analysis of Small-Scale Farmers' Perception of the Effect of Insurgency on Food Security in Borno State, Nigeria

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Abstract: The study examined small-scale farmers' perception of the effect of insecurity on food security in Borno State, Nigeria. A multi-stage sampling technique was used to select 360 respondents, and primary data were collected using well-structured questionnaires. The data was analyzed by descriptive statistics, exploratory factor analysis, and multiple regression analysis. Hypotheses were tested using t-test and multiple regression analysis. The findings revealed that 75.5% of respondents were male, 60% were married, and 53% had formal education. The average age was 39 years, household size was 6, and farming experience averaged 20 years. Production significantly declined following insurgency, with 90.8% missing meals a few times within the year, while 63% attributed reduced food availability to diminished agricultural production. Limited market access was reported, with 62% indicating displacement as a key factor affecting food supply stability, and 49% perceiving increased malnutrition rates since insurgency began. The factor analysis shows that the causes of insecurity in the study area include socio-economic challenges, governance perceptions, trust and integrity, infrastructure conflicts, social issues, economic stability, and community land conflicts. The result of the multiple regression analysis showed that marital status, household size, education, and age significantly influenced production levels. Major farming constraints included herder-farmer conflicts, poor road access, high input costs, theft, and inadequate storage facilities. Hypothesis tests confirmed a significant difference in production without insurgency and with insurgency, with socio-economic characteristics (marital status, age, education, and household size) significantly affecting production levels. The study recommended that the government should prioritize security in agricultural sector to ensure farmers can access their land and engage in farming without fear of attacks or displacement in the region.

Keywords: Food security, insurgency, small-scale farmers, agricultural output, displacement.

1.0 INTRODUCTION

Food security remains a critical concern for national stability and human well-being. According to the World Bank (2019), food security exists when every person has access to adequate food for a healthy and productive life. Similarly, the Africa

Bureau of the US Agency for International Development (USAID, 2015) describes it as a state where all individuals have physical, social, and economic access to sufficient food to meet their daily nutritional needs and maintain good health. The Food and Agriculture Organization (FAO, 2015) further emphasizes that food security exists when individuals have physical and financial access to a sufficient and nutritious food supply that meets dietary requirements for an active and healthy life. These definitions collectively highlight four key dimensions of food security: availability, access, utilization, and stability.

Food availability refers to the presence of food in a given location, achieved through domestic production, imports, or food aid (Mutiah & Istiqomah, 2017). Food accessibility denotes individuals' ability to obtain adequate resources to purchase nutritious food (World Poverty Clock (WPC), 2020). Utilization relates to the effective use of food through a balanced diet, clean water, sanitation, and medical care, ensuring national well-being. Stability focuses on the consistent availability and accessibility of food, preventing food insecurity and hunger (WHO, 2021). However, food security is an evolving concern worldwide, affecting both developed and developing nations (Dubagat, 2016; Ogundari, 2018).

Nigeria's food insecurity crisis has worsened due to escalating national security challenges, including insurgency, banditry, and abductions. Prolonged military conflicts involving terrorist groups, particularly Fulani herdsmen and Boko Haram, have significantly disrupted farming communities, leading to loss of lives, destruction of property, and displacement of farmers (Ojo *et al.,* 2018). This unrest has hindered agricultural productivity, causing market disruptions and food price shocks (Fadare, Akerele, Mavrotas & Ogunniyi, 2019). A peaceful environment is essential for sustainable agricultural production and food security, as insecurity exacerbates food shortages and heightens national vulnerability (WPC, 2020).

Agriculture remains a vital sector in Nigeria's economy, particularly in rural employment, food sufficiency, and foreign exchange earnings, especially before the discovery of oil (Towobola *et al.,* 2014). The sector contributes about 40% to the country's economy and employs approximately 70% of the workforce, including 37% of the youth (National Bureau of Statistics (NBS) & Federal Ministry of Youth Development, 2013). However, insurgency, particularly in northern Nigeria, has destabilized agricultural production. This has led to reduced crop yields, scarcity of production resources, labor shortages, and increased transportation costs, significantly driving up food prices (Kegna *et al.*, 2014).

Small-scale farmers dominate Nigeria's agricultural sector, yet they are often predisposed to low productivity due to challenges affecting their efficiency. These farmers typically cultivate small plots of land using traditional farming practices, local knowledge, and family labor (Yusuf and Francis, 2019). They play a crucial role in food production, biodiversity conservation, and maintaining traditional agricultural practices. However, their reliance on natural resources and limited adaptive capacity make them vulnerable to external shocks such as climate change, market instability, and conflict (Adebisi *et al.,* 2016). In regions affected by violence, their livelihoods are severely threatened, worsening food insecurity.

Moreover, Northern Nigeria, especially Borno, Adamawa, and Yobe States, hosts the highest number of internally displaced persons due to conflict and terrorism. The Nigerian food poverty situation remains dire despite numerous interventions aimed at addressing the crisis (Oni & Fasogbon, 2019). Given that the region supplies a significant portion of Nigeria's cereal crops, food security has become a major concern for both local communities and the country at large. The persistent insurgency has not only disrupted agricultural activities but has also created long-term economic and social instability, further deepening the food security crisis.

However, Borno State's agrarian economy heavily depends on farming. Yet, ongoing violence has not only displaced farmers but also led to the destruction of farmland, loss of livestock, and restricted access to markets and agricultural inputs. These disruptions have significantly reduced food production, worsening food insecurity and malnutrition (Ojo, Usman, Mohammed, Ojo & Oseghale, 2018). Reports indicate that millions of people in Borno are experiencing acute food insecurity, with many households unable to meet their basic nutritional needs (Ikemefuna, 2022). The impact of the insurgency is multifaceted, affecting agricultural production, increasing vulnerability to food shortages, and deteriorating household resilience. Without urgent intervention to restore security and enhance agricultural productivity, the food crisis in Borno State is likely to persist, further threatening livelihoods and economic stability in the region.

The crisis in Borno State has had far-reaching effects beyond immediate agricultural losses. The conflict has disrupted food supply chains, affecting the availability of staple crops such as

cereals, vegetables, beans, yams, groundnuts, and onions in southern Nigeria (Onwusiribe, Nwaiwu & Okpokiri, 2015). Additionally, the breakdown of community support structures has further weakened farmers' resilience, impacting mental health and social cohesion. Despite food production in southern states, they cannot always meet the nation's food demands, exacerbating national food insecurity. Since the Boko Haram insurgency began in 2009, food insecurity in Maiduguri, the capital of Borno State, has intensified (Awodola & Oboshi, 2015). Maiduguri, previously a key commercial hub for agricultural trade with neighboring countries, has suffered major economic setbacks due to the ongoing crisis.

Despite numerous studies on food security in conflict-affected areas, research specifically focused on Borno State remains limited. Addressing this gap, this study will provide critical insights into the unique challenges faced by crisis-affected communities. Understanding farmers' perspectives regarding the effects of insurgency on food security are crucial in identifying the extent of these challenges and formulating targeted interventions to restore agricultural productivity and enhance resilience. This study aims to analyze the relationship between insecurity and food security in Borno State, providing insights necessary for designing policies that address the underlying issues and improve the region's long-term agricultural sustainability.

1.1 Objectives of the study

The broad objective of the study is to examine small-scale farmer's perception of the effect of insecurity on food security in Borno State Nigeria. The specific objectives are to:

I. describe the socio-economic characteristics of the respondents in the study area;
II. ascertain the level of food production without and with insurgency in the study area;
III. investigate how insurgency in Borno State has affected the four pillars of food security: food availability, accessibility, utilization and stability;
IV. examine the perceived causes of insurgency in the study area;
V. analyze the effects of socio-economic characteristics of farmers on level of agricultural output following insurgency in the study area;
VI. examine the constraints faced by the farmers in the study area.

2.0 METHODOLOGY

2.1 The study Area

The study was conducted in Borno State, located in Nigeria's North East geopolitical zone, shares international borders with Cameroon, Chad, and Niger, as well as domestic boundaries with Adamawa, Gombe, and Yobe States. Created in 1976 from the former North-Eastern State, it initially included present-day Yobe State, which became separate in 1991. The state has a population of approximately 4.17 million, accounting for about 3% of Nigeria's total population. Its vegetation is predominantly Sudan savanna, with a section of Sahel savanna in the north, supporting various trees such as acacia, baobab, locust bean, and shea butter. Agriculture and livestock farming have traditionally been the backbone of Borno's rural economy, with Maiduguri serving as a major trade and service hub. However, the rise of Boko Haram insurgency in 2009 led to widespread violence, displacing millions and significantly disrupting agricultural activities. Between 2012 and 2015, insurgents seized control of large parts of the state, forcing farmers from their lands and worsening food insecurity. A multinational military offensive in 2015 pushed the group into the Sambisa Forest and Lake Chad islands, but sporadic attacks on civilians and security forces persist. The prolonged insurgency has severely impacted development, making Borno one of Nigeria's least developed states, ranking low on the Human Development Index. Nevertheless, as insurgent activities have declined since 2016, efforts to rebuild the state's economy, improve security, and restore agricultural productivity have gradually resumed.

2.2 Sampling procedure and sample size

A multistage sampling procedure was adopted to select respondents for this study. In the first stage, three Local Government Areas (Bama, Chibok, and Magumeri) were purposively selected from the twenty-seven LGAs in Borno State due to their high level of insurgency in the area. The second stage involved the random selection of three agricultural zones from each of the selected LGAs. In the third stage, four agricultural extension blocks were randomly selected from each agricultural zone, resulting in a total of twelve extension blocks per LGA. In the fourth stage, three agricultural cells were randomly selected from each of the twelve extension blocks, leading to a total of thirty-six cells. The final stage involved the random selection of 120 respondents from each of the LGAs giving a total number of 360 respondents from the State. Therefore, the sample size for this study was 360 respondents.

2.3 Method of data collection and analysis

Primary data were utilized for this study. A well-structured questionnaire was employed to collect information from farmers. The researcher, assisted by well state-trained ADP enumerators (ADP Staff) familiar with the area, administered the questionnaires directly to the farmers in the study region. The data elicited from the respondents

includes socio-economic characteristics of the respondents, level of food production before and after insurgency, how insecurity in Borno State has affected the four pillars of food security food availability, accessibility, utilization and stability, perceived causes of insecurity, effects of socio-economic characteristics of farmers on level of agricultural output following insurgency and constraints faced by the farmers in the study area. The data collected were analyzed using descriptive statistics (mean, percentages and frequency count) and inferential statistics (mutliple regression analysis and exploratory factor analyis (EFA)).

3.0 RESULTS AND DISCUSSION

3.1 Socio Economic Characteristics of Farmers in the Study Area

The results in Table 1 revealed that majority (75.5%) of the farmers were males while 24.5% were females. This gender distribution shows that the majority of small-scale farmers were males. Male predominance in agricultural activities could impact how food security challenges and insurgency are perceived, as men may be more exposed to conflict zones or hold different household responsibilities compared to female farmers. This is in line with the findings of Bwala, Mshelizah and Mshelia (2021) who found that farming in Borno State is dominated by male farmers.

More so, as revealed in Table 1, 60% of the respondents were married, 30.6% were single, while 9.2% were widowed. The high percentage of married farmers suggests that a significant number of households rely on farming for livelihood, which directly ties insurgency impacts to family welfare. Widowed respondents, though fewer, could represent a group particularly affected by insurgency, as loss of partners often brings additional challenges in maintaining family food security. This agrees with Gwary *et al.,* (2012) who revealed in their study on socio-economic determinants of farmers participation in research and extension activities that majority of farmers were married.

Educationally, most (53.0%) of the farmers had formal education, 31.1% of respondents had no form of education, while 15.6% of them had Quranic education. Those with higher education may perceive the impacts of insurgency on food security differently due to access to diverse information channels or higher mobility. Farmers who had no form of education may have limited access to information on farming techniques, climate-smart practices, or resilience strategies in times of crisis. Additionally, age distribution of farmers shows that the majority (37.2%) are between 21–30 years, a highly active group open to new farming practices. About 24.4% fall within 31–40 years, likely benefiting from experience and resources. Farmers aged 41–50 years make up 13%, while those 50 and above constitute 23%, potentially facing challenges with adaptability. Overall, over 60% of respondents are 40 years or younger, indicating a young and resilient farming community that could benefit from targeted training and resources. The average age is 39, aligning with Bwala *et al.* (2021), who noted that most farmers are within productive ages.

The majority of farmers (55.1%) had a household size of five or fewer, potentially limiting family labor for farming, while 33.9% had 6–10 members, and 11.1% had at least 11 members. The average household size was six, which may positively influence productivity through increased labor availability. Regarding farming experience, 57% had 10 years or less, indicating a large proportion of relatively new farmers, while 10.3% had 11–20 years, and 25.6% had at least 31 years of experience. The average farming experience was 20 years, which can enhance efficiency and resilience.

These socio-economic traits reveal both vulnerabilities and strengths. Male farmers may face higher risks in conflict-prone areas, while the high number of married farmers suggests family-oriented agricultural operations. Education influences farmers' adaptability to security challenges, with less-educated farmers relying on local knowledge and educated ones utilizing modern techniques. Overall, the demographic composition suggests potential for high productivity, given the mix of young farmers, moderate household sizes, and diverse farming experience.

Table 1: Socio Economic Characteristics of Farmers in the Study Area

Socio-economic Characteristics	Frequency	Percent	Mean
Gender			
Male	265	75.5	
Female	86	24.5	
Marital Status			
Single	110	30.6	
Married	216	60.0	
Widowed	33	9.2	

Level of Education			
No School at all	112	31.1	
Quranic Education	56	15.6	
Primary Education	86	23.9	
Secondary Education	61	16.9	
Post-Secondary Education	45	12.2	
Age			
≤ 20	8	2.2	
21 – 30	134	37.2	
31 – 40	88	24.4	39
41 – 50	47	13	
≥ 51	82	23	
Household Size			
≤ 5	166	55.1	
6 – 10	102	33.9	6
11 – 15	25	8.4	
≥ 16	8	2.7	
Years of Farming Experience			
≤ 10	200	57	
11 – 20	36	10.3	20
21 – 30	25	7.1	
≥ 31	90	25.6	

Source: *Field Survey, 2024*

The result of the level of food production among small-scale farmers is presented in Figure 1. The mean score for food production level without insurgency was 4.38 while the mean score for the level of production following the onset of insurgency is 2.24. The mean production level drops sharply from 4.38 before the insurgency to 2.24 after. This decrease indicates that farmers perceive a substantial reduction in food production levels, likely due to factors associated with the insurgency, such as displacement, restricted access to farmlands, loss of assets, and increased insecurity.

The significant drop in mean production levels underscores the profound effect of insurgency on agricultural productivity. Insurgency disrupts critical agricultural processes, including land preparation, planting, harvesting, and market access, leading to reduced yields and heightened food insecurity. Lower production levels post-insurgency could also reflect the psychological impact on farmers. Constant threats of violence may reduce the willingness to invest in or expand farming operations, with farmers possibly cultivating smaller plots or abandoning certain crops due to limited safety and access. This result aligns with the findings of Adewuyi and Michael (2020) who conducted a study on the impact of insurgency on food production in Borno State. They found that there was significant drop in the level of food production since the inception of insurgency in the state.

3.2 Farmers' Perception of the Level of Food Production without and with Insurgency in the Study Area

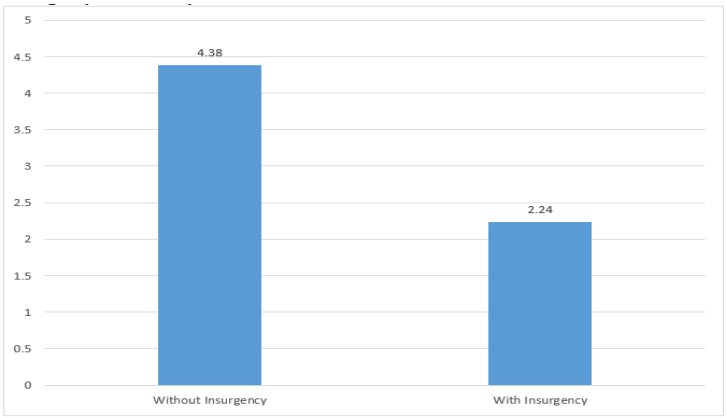

Figure 1: Level of Food Production without and with Insurgency in the Study Area
Source: *Field Survey, 2024*

3.3 Farmers' Perception on Food Security in the Study Area

The data on farmers' perceptions of food security, presented in Table 2, provides an overview of the challenges they face in Borno State, particularly in the context of the impacts of insurgency. As revealed in Table 2, majority (90.8%) of farmers missed meals several times within the year. The fact that 90.8% of respondents reported missing meals several times within the year is a stark indicator of food insecurity. Missing meals is often a sign of extreme hardship and suggests that these farmers and their families experience significant food shortages. This result aligns with Idrisa *et al.,* (2008) who stated that some families in Borno State had to resorted to eating once in a day due to the high level of food insecurity.

Moreover, most (86.1%) of the respondents perceived food supply as highly unpredictable. This aligns with the disruptions in agriculture due to the insurgency, as insecurity affects planting, harvesting, and distribution, making food availability unreliable. About 85.3% indicated that getting food was very costly. This implies that even when food is available it was often too expensive for most families. The insurgency may have increased food costs by limiting supply chains and increasing transportation risks, making essential goods scarcer and driving prices up. The reliance on relief items by 72.5% of the respondents suggested that many families could no longer sustain themselves through farming or local food sources. This dependence highlights the degree of food insecurity and how insurgency disrupted traditional means of livelihood. Only 3.9% and 3.3% of respondents accessed three meals a day throughout the year and food all year round, respectively. In their study on Food security and hygiene practice in Borno State, Charles Shapu (2020) stated that there was significant low access to food in the state. Thus, food insecurity is high among farmers in Borno State due to insurgency, causing unstable food supplies, high costs, and meal skipping. Reliance on aid has increased as farmland access, productivity, and self-sufficiency decline. Limited government support calls for stronger food assistance programs.

Table 2: Farmers' Perception on Food Security in the Study Area

Perception of Farmers on Food Security	Frequency*	Percentage (%)
We always have food throughout the year	12	3.3
State government regularly supply food	12	3.3
My family have access to three square meals per day throughout the year	14	3.9
We mostly depend on relief items	261	72.5
Getting food is very costly	307	85.3
Food supply is very unpredictable	310	86.1
My family missed food/meal a few times within the year	327	90.8

Source: Field Survey, 2024 ****Multiple responses allowed***

3.4. The Effect of Insurgency on Availability of Food in Study Area

The data presented in Table 3 reveals the effects of insurgency on food availability in study area. As revealed in Table 3, majority (63%) of the respondents attributed reduced food availability to diminished agricultural production. Insurgency often displaces farmers, restricts access to farmlands, and disrupts normal farming cycles, resulting in lower crop yields and livestock production. The decrease in production directly reduces the amount of food available for both local consumption and market supply. This is in line with the assertions of Ikemefuna (2022) who reported that available food was not sufficient to meet the demand in the study area due to disruption of agricultural activities by insurgency.

However, nearly 39% of respondents noted that insurgency has disrupted the food supply chain. This includes difficulties in transporting goods, road insecurity, and interruptions in market access. Such disruptions mean that even when food is produced, it may not reach markets or communities that need it, further contributing to shortages and inflated prices. About 25% of respondents reported that insurgency led to increased food prices. Reduced local production and supply chain disruptions create scarcity, driving up prices in affected areas. Higher prices make food less affordable, especially for low-income households, further exacerbating food insecurity. In their study on the effects of conflict on agriculture, Adelaja and George (2019) reported that insurgency has affected every part of economy including food supply.

Thus, the results indicate that insurgency significantly affects food availability by disrupting production, distribution, and pricing. A large proportion of farmers reported reduced production due to displacement and abandoned fields, increasing reliance on food aid. Disruptions in supply chains further limit food accessibility, particularly in rural areas, while market instability leads to unpredictable access. Additionally, insurgency-driven scarcity has caused food price inflation, disproportionately

impacting low-income households. These findings align with Adelaja and George (2019), who highlighted that insurgency disrupts agricultural activities, leading to food shortages

Table 3: Effect of Insurgency on Availability of Food

Effect	Frequency*	percentage (%)
Reduced agricultural production	227	63
Disruption of food supply chain	142	39
Increased food prices	90	25

Source: Field Survey, 2024 ****Multiple responses allowed***

3.4.2 The Effect of Insurgency on Access to Food in the Study Area

The results in Table 4 revealed the specific challenges faced by small-scale farmers in the study area. Majority (63%) of respondents reported limited physical access to markets and food sources. This is likely due to road closures, checkpoints, and security risks that restrict movement, making it difficult for farmers to reach markets to buy or sell food. Limited access to food sources, including local markets, reduces household food accessibility and forces reliance on alternate, often less reliable, sources. This assertion agrees with the findings of Mohammed (2020) which revealed that prolonged crisis in the study area has restricted passage of food to major markets. About 28% of respondents experienced loss of income or livelihoods as a result of the insurgency. Insurgency often disrupts economic activities, displacing farmers and preventing them from working their land or engaging in other income-generating activities. The resulting financial strain decreases purchasing power, making it difficult for households to buy sufficient food even when it is available. Approximately 21% of respondents reported increased reliance on food aid. The reliance on aid suggests that local food systems have been disrupted to the extent that many families cannot meet their food needs independently. Food aid becomes essential for survival when access to traditional food sources is hindered by insecurity and economic loss. In his study on the impact of Boko Haram insurgency on the people of Borno State, Granville (2020) noted that the insecurity in the state has transformed into a serious humanitarian crisis with most people requiring external aid.

These findings highlight the ways in which insurgency restricts both physical and economic access to food, creating multiple layers of food insecurity. The fact that over half of respondents have limited access to markets and food sources suggests that physical safety and security concerns are major obstacles. Restricted movement limits the flow of goods and food supplies, further isolating rural communities and making it difficult for farmers to sustain their livelihoods.

Loss of income and livelihoods reduces household purchasing power, making it harder for families to buy food, even if it is available in local markets (de Bruin *et al.,* 2021). Therefore, Insurgency-induced economic hardship weakens income security, increasing reliance on food aid. While essential in crises, prolonged aid dependency reduces resilience and discourages local production in the study area.

Table 4: The Effect of Insurgency on Access to Food

Effect	Frequency	Percentage (%)
Limited physical access to markets and food sources	228	63
Loss of income or livelihoods	102	28
Increased reliance on food aid	77	21

Source: *Field Survey, 2024*

3.4.3 The Effect of Insurgency on Utilization of Food

The data in Table 5 highlights how prolonged insecurity has affected nutrition and food safety among small-scale farmers and their communities. Nearly half (49%) of respondents perceive that malnutrition rates have increased. This is a critical finding, as malnutrition can have long-term health consequences, especially for children and vulnerable populations. The increased malnutrition rate is likely a direct result of food shortages, reduced dietary diversity, and limited access to affordable, nutritious food. Approximately 31% of respondents reported reduced dietary diversity. This indicates that many households were unable to access a variety of food types, likely due to restricted market access and high food prices. Limited dietary diversity often means fewer nutrient-rich foods, such as fruits, vegetables, and protein sources, leading to poorer overall nutrition and health outcomes.

Furthermore, 31% of respondents expressed concerns over food safety. Food safety issues can arise from the need to rely on non-traditional food sources or poorly stored relief supplies. In areas affected by insurgency, food may be stored in less-

than-ideal conditions or may have to be transported over long distances, increasing the risk of contamination and spoilage. This study agrees with the assertions of Ahmed, Yahaya, Jidda, Ali and Dingari (2024) who identified high level of malnutrition in the study area, as well as the need for increased medical care, and specialized interventions.

These findings reveal significant dietary changes, with a shift toward less nutritious, potentially unsafe food as consequence of the insurgency. Reduced dietary diversity indicates that families are primarily consuming staple foods that may lack essential vitamins and minerals. This can lead to deficiencies in micronutrients, affecting health, immunity, and cognitive development, especially in children. The disruption in supply chains and reduced purchasing power contribute to limited access to diverse food options. The high percentage of respondents who report increased malnutrition rates underscores the severe impact of insurgency on nutrition. Malnutrition is often an outcome of prolonged food insecurity and limited dietary options, both of which are common in conflict zones (Mohamed, 2017). This trend could lead to a rise in cases of underweight, stunting, and wasting among children, along with other health risks in adults.

Table 5: Effect of Insurgency on Utilization of Food in the Study Area

Effect	Frequency*	%
Reduced dietary diversity	112	31
Increased malnutrition rates	176	49
Food safety concerns	113	31

Source: *Field Survey, 2024*

3.4.4 Effect of Insurgency on Stability of Food Supply in the Study Area

The data on the impact of insurgency on the stability of food supply among small-scale farmers in Borno State (Table 6) reveals several key ways in which food stability has been compromised. A majority (62%) of respondents cite displacement of farming communities as a major factor affecting food supply stability. Displacement removes farmers from their land, preventing them from planting, harvesting, and maintaining local food production. This large-scale displacement has a direct impact on food stability, as the people who would normally contribute to the food supply are forced to leave their farms and livelihoods. This aligns with Adewuyi and Michael (2020) who stated that one of the effects of insurgency in Borno State was the displacement of people which ultimately disrupts economic activities such as farming, and as a result affecting food supply.

Approximately one-third (33%) of respondents reported that insurgency has heightened vulnerability to food crises. This means that communities are more susceptible to sudden and severe food shortages, which can be triggered by conflict-related disruptions or environmental factors. This increased vulnerability indicates a weakened resilience among farming communities, making it difficult for them to withstand any further shocks to their food systems. This is in line with the position of Ikemefuna (2022) who stated that the prolonged insurgency in the state has significantly affected food systems in the affected areas.

One-quarter (25%) of respondents experience seasonal food shortages. The combination of displacement and interrupted farming cycles may have intensified these shortages, as communities are unable to produce or store enough food to last through off-season periods. Seasonal shortages suggest that food stability is especially fragile during certain times of the year, making the community heavily reliant on outside assistance.

The displacement of farming communities is perhaps the most impactful factor in destabilizing food supply (George and Adelaja, 2021). With large numbers of farmers unable to access their land, local food production decreases sharply, affecting both immediate food availability and longer-term food security. Displaced farmers often lose access to their crops, tools, and livestock, creating a gap in the food supply chain that can take years to restore. Seasonal food shortages indicate that even during relatively stable periods, food supply remains precarious. Without the ability to produce and store enough food to last through these periods, households are left dependent on aid, which may not always arrive in time or be sufficient. Seasonal shortages, compounded by insurgency disruptions, highlight the need for interventions that can support consistent food production and storage practices.

The insurgency has significantly destabilized the food supply in Borno State by increasing vulnerability to food crises, displacing farming communities, and creating seasonal shortages. These disruptions not only affect immediate access to food but also weaken the overall food system, leaving communities more exposed to future crises (Mohammed, 2020).

Table 6: Effect of Insurgency on Stability of Food Supply

Effect	Frequency	%
Increased vulnerability to food crises	117	33
Displacement of farming communities	224	62
Seasonal food shortages	90	25

Source: *Field Survey, 2024*

3.5 Perceived Causes of Insurgency by the Farmers

The factor analysis results presented on Table 7 identified key causes of insecurity in the study area. The factor analysis results indicate that components with Eigen values greater than 1 were retained, as they explain more variance than individual variables. The first component, with an Eigen value of 5.887, accounts for 32.706% of the variance, which is expected as the first component typically captures the largest share of variance. The seven components collectively explain 83.928% of the total variance, demonstrating a well-fitting factor model. The Rotated Component Matrix groups variables into seven thematic areas, each representing distinct causes of insecurity in the study area.

The first component (32.706%) encompasses socio-economic issues, including poverty/hunger (.847), poor security (.807), low education (.735), and unemployment (.703). The second component (17.341%) reflects governance perceptions, with unfavorable policies (.955), lopsided appointments (.863), and marginalization (.635). Trust and integrity form the third component (12.569%), highlighting betrayal (.893) and corruption (.598). The fourth component (8.731%) relates to infrastructure and land use conflicts, featuring grazing on arable land (.886) and poor road networks (.519). Social challenges and crime define the fifth component (5.962%), with illiteracy (.446) and criminal activities (-.878). Economic stability (4.853%) forms the sixth component, including income instability (.845) and greed (.624). The final component (1.766%) focuses solely on land disputes (.931). These findings align with Ojochenemi (2019) and Ikeji (2015), who emphasize socio-economic and political factors as primary drivers of insecurity in Nigeria. Based on these groupings, causes of insecurity in the study area are themed to include socio-economic challenges, governance perceptions, trust and integrity, infrastructure conflicts, social issues, economic stability, and community land conflicts. In the study on comparative assessment of the Niger-Delta militancy and the insurgency in North East Nigeria, Ojochenemi (2019) stated that peculiar socio-economic factors play significant roles in the different crisis. Also, Ikeji (2015) outlined socio-political factors as part of the causes of insurgency.

Table 7: Factor Analysis of Perceived Causes of Insurgency

	Component						
	1	2	3	4	5	6	7
Poverty/hunger	.847		-.188		.229	-.227	.111
Poor security system	.807	.102			-.151	.150	.128
Low level of education	.735		-.328	.326	.268		-.185
High level of unemployment	.703	.353	-.389		.225	-.212	
Unfavourable government policies		.955	-.113	.139		-.104	
Lopsided government appointment	.355	.863	-.109	.166		-.143	
Feeling of marginalization	.113	.635	.355		.361	.331	
Corruption	.247	.598	.451	.280	.110	.185	-.343
Betrayal/breach of trust	-.135		.893		-.136		
Religious fanaticism	.552	.206	-.699				
Poor road network	-.308	-.101	.519	-.172	-.510	-.279	.250
Grazing on arable land				.886	.281		.103
Absence of basic infrastructure facilities	.366	.224		.759			-.189
High rate of criminal activities				-.116	-.878		-.108
Income instability		-.152			.180	.845	
Greed	-.212	.141		.372	-.195	.624	.182
Land dispute in the community	.148					.131	.931
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.							
a. Rotation converged in 10 iterations.							

Source: *Field Survey, 2024*

3.6 Effects of Socio-Economic Characteristics of Farmers on Agricultural Production in the Study Area

The results of multiple regression estimate on the effect of socio-economic factors on agricultural production among farmers is presented in Table 8. The R^2 = 0.336 which means that approximately 33.6% of the variation in farmers' production is explained by the predictors included in this model (sex, marital status, household size, age, farming experience, and education). This indicates a moderate explanatory power. The F-statistic = 23.436 ($p < 0.01$), showing that the model is statistically significant, implying that the predictors collectively have a significant impact on the level of production. The result showed that marital status, household size, and education were significant at 1% probability while age was significant at 5%.

Marital status is statistically significant at the 1% level ($p < 0.01$), with a negative coefficient. This indicates that being married (compared to single or other marital statuses) is associated with a lower level of production, controlling for other factors. Married individuals may prefer less risky, smaller-scale production strategies to ensure family security, which could result in lower overall output. Anigbogu, Agbasi and Okoli (2015) revealed that marital status significantly affect agricultural production. However, they revealed that marital status of farmers has a positive relationship with farmers' productivity as opposed to the negative relationship that this result revealed.

Household size is highly significant ($p < 0.01$) and has a positive coefficient, meaning that an increase in household size is associated with higher levels of production (Table 4.8). This could imply that larger households contribute more labor or support to farming activities, enhancing production levels. This agrees with Ugressa (2015) who found that household size was one of the significant factors that affect agricultural labour and ultimately, agricultural productivity.

Age is statistically significant at the 5% level ($p < 0.05$), with a negative coefficient. This suggests that as age increases, the level of production slightly decreases. Older farmers may face physical or resource limitations that impact productivity. This finding aligns with Guo, Wen and Zhu (2015), who stated, in their study on the impact of aging agricultural labour on output, that age has a significant inverted relationship on agricultural production.

Education is highly significant ($p < 0.01$) and has a positive coefficient. This suggests that higher levels of education are strongly associated with increased levels of production. Educated farmers may be more likely to adopt modern farming techniques and practices that enhance productivity. This is in agreement with the assertions of Eric, Prince and Elfreda (2014) who reported that education has a positive effect on agricultural production. They found that the use of education increases agricultural productivity.

Table 8: Effects of Socio-Economic Characteristics of Farmers on Agricultural Output in the Study Area

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.280	.284		8.023	.000
	Sex	-.042	.111	-.022	-.381	.703
	Marital status	-.307	.102	-.215	-3.021*	.003
	Household size	.143	.022	.586	6.507*	.000
	Age	-.020	.010	-.348	-1.981**	.049
	Farming experience	.004	.007	.100	.664	.507
	Education	.137	.024	.453	5.771*	.000
a. Dependent Variable: Farmers' Level of Production						

R^2 = 0.336 f statistics = 23.436 (p<0.01) *significant at 1%, **significant at 5% level of probability

Source: Field Survey, 2024

3.7 Constraints faced by Farmers in the Study Area

The results presented in Table 9 shows the constraints faced by small-scale farmers in the study area, with significant concerns around conflicts, costs, infrastructure, and inadequate resources. The constraints with mean score equal to or greater than 3.5 were considered primary constraints. Those with mean scores ranging from 3.00 to 3.50 were grouped as secondary constraints, while those with mean scores less than 3.00 were classified as less significant constraints. Primary constraints (≥3.5) include herder-farmer conflicts (3.73), poor road access and transport facilities (3.64), high cost of inputs (3.59), pilfering and theft (3.59), and inadequate storage facilities (3.58). Herder-farmer conflicts emerged as the most critical constraint, with 76.4% of respondents strongly agreeing that these

conflicts disrupt farming activities and affect land access, leading to decreased productivity. This finding aligns with Igbini (2022), who identified banditry and conflicts as major threats to economic stability. Poor infrastructure, particularly road access and transport facilities, also poses a major challenge, as 70.6% strongly agree that it limits market access and increases transportation costs. This supports Olorunfemi (2020), who emphasized that inadequate infrastructure is a major barrier to agricultural development. Additionally, pilfering and theft (63.9%) further exacerbate losses, affecting food security and farm profitability.

The high cost of farm inputs (63.1%) is another significant constraint, limiting farmers' ability to invest in essential resources such as seeds, fertilizers, and equipment, thereby reducing productivity. This finding aligns with Chand (2022), who argued that high input costs directly affect agricultural productivity. Inadequate storage facilities (64.7%) also contribute to post-harvest losses, making food security more precarious, especially during peak harvest seasons.

Secondary constraints (3.00–3.50) include disputes over arable land (3.48), high incidence of pests and diseases (3.47), high cost of acquiring credit facilities (3.44), and poor land tenure systems (3.32). Land disputes hinder agricultural productivity, with 57.5% of respondents strongly agreeing that conflicts over ownership and land use affect farming activities. Access to affordable credit is another issue, as 58.6% strongly agree that high interest rates limit their ability to expand and modernize farming operations. Pest and disease outbreaks are also a concern, with 63.1% strongly agreeing that these challenges significantly reduce crop yields.

Less significant constraints (<3.00) include inadequate market information (2.95), limited extension services (2.96), lack of technology (2.71), low levels of irrigation, climate change, land degradation (2.52), and market and certification barriers (2.14). Although these factors were rated lower, they still present challenges to long-term agricultural sustainability.

This result shows that the most pressing challenges for small-scale farmer in the study area revolved around security, infrastructure, and high input costs, which have immediate impacts on their productivity and food security. Furthermore, although technology and advisory services are rated as less critical, their gradual enhancement could strengthen the resilience of farmers over time.

Table 9: Constraints faced by Farmers in the Study Area

Constraint	SA (%)	A (%)	D (%)	SD (%)	Mean Score
Herder-farmer conflicts	275 (76.4)	72 (20.0)	12 (3.3)	0(0)	3.73
Disputes over arable land resources	207 (57.5)	118 (32.8)	34 (9.4)	0(0)	3.48
Inadequate market information	118 (32.8)	106 (29.4)	135 (37.5)	0(0)	2.95
Inadequate storage facilities	233 (64.7)	78 (21.7)	34 (9.4)	0(0)	3.58
High cost of acquiring credit facilities	202 (58.6)	100 (29.0)	35 (9.7)	8 (2.2)	3.44
High cost of farm inputs	227 (63.1)	82 (22.8)	16 (4.4)	8 (2.2)	3.59
Poor road access and transport facilities	254 (70.6)	75 (20.8)	0(0)	16 (4.4)	3.64
Inadequate extension and farm advisory services	76 (21.1)	187 (51.9)	60 (16.7)	14 (3.9)	2.96
Pilfering/theft	229 (63.9)	92 (25.6)	24 (6.7)	0(0.0)	3.59
High incidence of pests and diseases	227 (63.1)	54 (15.0)	64 (17.8)	0(0.0)	3.47
No co-operative or farm association	88 (24.4)	46 (12.8)	146 (40.6)	65 (18.1)	2.46
Lack of technology	79 (21.9)	106 (29.4)	140 (38.9)	20 (5.6)	2.71
Poor land tenure system	225 (62.5)	36 (10.0)	36 (10.0)	40 (11.1)	3.32
Low level of irrigation farming, climate change and land degradation	70 (19.4)	114 (31.7)	86 (23.9)	75 (20.8)	2.52
Market and certification barriers	16 (4.4)	74 (20.6)	199 (55.3)	56 (15.6)	2.14

SA = strongly agree, A = agree, D = disagree, SD = strongly disagree

Source: *Field Survey, 2024*

4.0 CONCLUSION

This study examined small-scale farmers' perceptions of insurgency's impact on food security in Borno State, Nigeria. Findings show that insurgency has severely disrupted agricultural productivity, food supply, and market access, leading to reduced food security. Many farmers faced declining production, rising food prices, and dependence on aid. Socio-economic factors such as age, household size, education, and experience

influenced farmers' resilience, with younger, larger households and educated farmers showing better adaptability. Farmers identified poverty, poor infrastructure, and lack of basic services as key drivers of insecurity. To mitigate these challenges, efforts should focus on restoring security, improving agricultural support, and enhancing access to resources, markets, and extension services to rebuild food security and farmer resilience conflict-affected region.

4.1 Recommendations

Based on the findings of the study the following recommendations are proposed to enhance food security and improve the resilience of farmers:

1. The government should ensure farmers' safety by deploying security personnel and establishing local security partnerships to prevent attacks and displacement.
2. The government should develop alternative transport routes and establish periodic markets in safe zones to help farmers sell produce and access supplies with reduced risk.
3. Government agencies and NGOs should expand food aid distribution in severely affected areas to combat food insecurity and malnutrition.
4. The government and international organizations should implement long-term initiatives to tackle poverty, unemployment, and infrastructure deficits through job creation, education, and essential services.
5. Policymakers should ensure balanced regional development to reduce marginalization and address grievances fueling insurgency.

REFERENCES

- Adebisi, S. A., Azeez, O. O., and Oyedeji, R. (2016). Appraising the effect of Boko Haram insurgency on the agricultural sector of Nigerian business environment. *Journal of Law and Governance*, *11*(1), 15-26.
- Adelaja, A. and George, J. (2019). 'Effects of conflict on agriculture Evidence from the Boko Haram insurgency', *World Development,* 1(17), 184-195.
- Adewuyi, K. A., and Michael, A. (2020). Assessment of the impact of Boko-Haram insurgency on food crop production in Chibok local government area of Borno state, Nigeria. *Global Journal of Human-Social Science: A Arts and Humanities–Psychology*, *20*(12), 50-54.
- Ahmed, A., Yahaya, H., Jidda, A., Ali, F. A., and Dingari, C. A. (2024). The Effect of Boko Haram Insurgency on Health and Nutrition among the Residents of Bolori 2 of Maiduguri Metropolitan Council of Borno State, Nigeria. *International Journal of Research and Scientific Innovation*, *10*(12), 643-655.
- Anigbogu, T. U., Agbasi, O. E., and Okoli, I. M. (2015). Socioeconomic factors influencing agricultural production among cooperative farmers in Anambra State, Nigeria. *International Journal of Academic Research in Economics and Management Sciences*, *4*(3), 43-58.
- Awodola, B. and Oboshi, A. (2015). Terrorism in Northern Nigeria: A threat to food security in Maiduguri. *Mediterranean Journal of Social Sciences*, 6 (32): 11-23.
- Bwala, J. M., Mshelizah, U. M., andMshelia, B. S. (2021). A Socio-economic Survey of Farmers in Selected Local Government Areas of Borno State, Northeastern Nigeria. *Journal of Agricultural Economics, Environment and Social Sciences*, *7*(2), 138-151.
- Chand, R. (2022). Agricultural challenges and policies for the 21st century. *NABARD Research and Policy Series*, (2), 36.
- Charles Shapu, R., Ismail, S., Ahmad, N., Lim, P. Y., and Abubakar Njodi, I. (2020). Food security and hygiene practice among adolescent girls in Maiduguri metropolitan council, Borno state, Nigeria. *Foods*, *9*(9), 1265. (majority have low access to food)
- de Bruin, S., Dengerink, J., and van Vliet, J. (2021). Urbanisation as driver of food system transformation and opportunities for rural livelihoods. *Food Security*, *13*(4), 781-798.
- Dubagat, K.K. (2016). 'Special Report: Food Security Challenges in West Africa: A Focus on Agriculture', West Africa Insight.
- Eric, O. O., Prince, A. A., and Elfreda, A. N. A. (2014). Effects of education on the agricultural productivity of farmers in the Offinso Municipality. *International Journal of development research*, *4*(9), 1951-1960.
- Fadare, O., Akerele, D., Mavrotas, G. and Ogunniyi, A. (2019). Effect of conflict and food price shocks on calorie intake and acute malnutrition in Nigeria: A micro-panel data analysis. Paper presented at the 93rd Annual Conference of the Agricultural Economics Society, University of Warwick, England 15 - 17 April 2019. Retrieved from https://EconPapers.repec.org/RePEc:ags:aesc19:289676(Last accessed: 16/10/2023).
- FAO (2015). The state of insecurity, innovation in the family. Retrieved on October 16th, 2023 from http//www.fao.org/3/a;i4040epdf
- Federal Government of Nigeria (2019). National Youth Policy (2019-2023): Enhancing Youth Development and Participation in the context of Sustainable Development. *Federal Ministry of Youth and Sports Development*
- George, J., and Adelaja, A. (2021). Forced displacement and agriculture: implications for host communities. *Sustainability*, *13*(10), 5728.

- Granville, C. K. (2020). *The impact of Boko Haram insurgency on the people of Borno State* (Doctoral dissertation, Walden University).
- Guo, G., Wen, Q., and Zhu, J. (2015). The impact of aging agricultural labor population on farmland output: from the perspective of farmer preferences. *Mathematical problems in Engineering*, *2015*(1), 730618.
- Gwary, M. M., Gwary, T. M., and Mustapha, S. B. (2012). Discriminant analysis of the influence of farmers' socio-economic characteristics on their participation in research and extension activities in Borno State, Nigeria. *International Research Journal of Social Sciences*, *1*(4), 1-6.
- Idrisa, Y. I., Gwary, M. M., and Shehu, H. (2008). Analysis of food security status among farming households in Jere Local Government of Borno State, Nigeria. *Agro-Science*, *7*(3). 199-205.
- Igbini, M. D. (2022). Banditory and Security Threats: An Analysis Of Insecurity In Nigeria. *Journal of Public Administration, Finance and Law*, *11*(23), 53-62.
- Ikeji, V. C. (2015). *Socio-Political Conflict and The Boko Haram Insurgency in Nigeria* (Doctoral dissertation, DEPARTMENT OF POLITICAL SCIENCE, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF IBADAN).
- Ikemefuna, C. S. (2022). *A case study of violent conflict and its impact on food availability in Borno state, Nigeria* (Master's thesis, Norwegian University of Life Sciences, Ås).
- Kegna, A., Djire, M., Adibe, J. and Jirgi, A. J. (2014). The impact of conflict and political instability on agricultural investments in Mali and Nigeria. African Growth Initiative 2014 at Brookings. Pp. 4-27
- Mohamed, A. A. (2017). Food security situation in Ethiopia: a review study. *International journal of health economics and policy*, *2*(3), 86-96.
- Mohammed, N. T. (2020). Insurgency and human security challenges in Nigeria: Borno state in perspective. *KIU Journal of Humanities*, *5*(1), 195-203.
- Mutiah, S. A., & Istiqomah, I. (2017). Determinants of household food security in urban areas. *JEJAK: Jurnal Ekonomi Dan Kebijakan,* 10(1), 103-120.
- National Bureau of Statistics (NBS) and the Nigerian Federal Ministry of Youth Development (2013). 2013 National Baseline Youth Survey. Abuja; National Bureau of Statistics.
- Ogundari, K. (2018). Determinants of food-poverty states and the demand for dietary diversity in Nigeria. Contributed Paper Prepared for Presentation at the 4th International Conference of the African Association of Agricultural economist (AAAE), Cape Town, Hammamet, Tunisia, 22-25 September, 2013.
- Ojo, M. A., Usman, M. A., Mohammed, S. U., Ojo, A. O., and Oseghale, A. O. (2018). Effect of insurgency on food crop farmers' productivity in Borno and Gombe States, Nigeria. *Journal of Agriculture,* 30(3), 43-55
- Ojochenemi, D. (2019). *A comparative assessment of the socio-economic dimension of Niger delta militancy and Boko Haram insurgency: towards the security-development nexus in Nigeria* (Doctoral dissertation, University of Zululand).
- Olorunfemi, S. O. (2020). Rural road infrastructural challenges: An impediment to agricultural development in Idanre Local Government Area of Ondo State, Nigeria. *Ghana Journal of Geography*, *12*(2), 108-124.
- Oni, O.A., and Fasogbon, A. (2019). Food poverty and livelihoods issues in rural Nigeria *Journal of Poverty, Price Volatility, Efficiency and the Impacts of Population Shifts*, 8(2), 108-135.
- Onwusiribe, C. N., Nwaiwu, B. N. and Okpokiri, C. I. (2015), 'Assessment of North Insurgency and Performance of Food Dealers in Abia State, Nigeria', *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development,* 15(3), 217–24.
- Towobola, W. L., Luqman, R., Kolade, T. T., Ogunwale, A. B., and Olakojo, S. A. (2014). Entrepreneurship: A vehicle for sustainable food production in Nigeria. *Journal of Poverty, Investment and Development*, *5*, 23-24.s
- Urgessa, T. (2015). The determinants of agricultural productivity and rural household income in Ethiopia. *Ethiopian Journal of Economics*, *24*(2), 63-91.
- USAID (2015). Nigeria – Complex Emergency, Issues and Options in Developing Countries World Bank Policy Study, Washington, D.C: World Bank.
- World Bank (2019). Food insecurity in Africa Online: https://www.worldbank.org/en/country/nigeria (Last accessed: 02/010/2023).
- World Bank (2020). The World Bank in Nigeria. Online: https://www.worldbank.org/en/country/nigeria (Last accessed: 09/10/2023).
- World Poverty Clock (2020). Poverty Reduction in Africa Online: https://worldpoverty.io/map (Last accessed: 14/09/2023).
- Yusuf, I. E. and Francis, J. T. (2019). Agricultural programmes and food security in Nigeria (1960–2016). A historical overview. *Humanity Jos Journal of General Studies*, *10*(1), 143-154.