

Government Expenditure on Agriculture and Food Security in Nigeria

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ABSTRACT

Food security remains a central development challenge in Nigeria, particularly in the context of climate variability, financial constraints in agriculture and insecurity. It is on this note that this study examined the impact of government expenditure on agriculture on food security in Nigeria within the period of 1986 to 2024. Data for the analysis was sourced from CBN statistical bulletin. Food production index was used as a dependent variable while the exogenous variables include government expenditure on agriculture, agricultural credit guarantee scheme funds, average rainfall level and terrorism perception index. Consequently, this research adopted Ex-Post Factor research design in which multiple regressions was used. Augmented Dickey Fuller (ADF) and Philip Perron (PP) autoregressive distributed lag model were employed as the research techniques, specifically for stationary test and estimation of the long run and short run relationship of the variable. The results showed that: government expenditure on agriculture has positive and significant impact on food supply in Nigeria, agricultural credit guarantee scheme fund has positive and significant impact on food supply in Nigeria, average rainfall has positive and significant impact on food supply in Nigeria, terrorism perception index has negative and insignificant impact on food supply in Nigeria within the time of the study. Based on the results, this research recommends that Nigerian government should boost funding for agricultural research institutions to develop resilient seeds and modern technologies, paired with strengthening extension services to train farmers. and also, ensure accessibility for smallholder farmers, and enhancing monitoring to prevent loan diversion.

Keywords: Food security; Government expenditure on agriculture; Agricultural Credit Guarantee Scheme Fund (ACGSF); Rainfall variability; Terrorism perception; Nigeria.

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1. Introduction

Food security has become one of the most pressing global development challenges due to the increasing prevalence of hunger, malnutrition, and food shortages affecting millions of people worldwide. It has attracted considerable international attention because access to adequate, safe, and nutritious food is fundamental to human survival, economic productivity, social stability, and sustainable development. According to the United States Agency for International Development (USAID, 2020), more than 800 million people go to bed hungry every night. Similarly, the Food and Agriculture Organization (FAO, 2022) estimated that about 828 million people suffered from chronic hunger in 2021, representing an increase of 46 million people compared with 2020 and 150 million since the outbreak of the COVID-19 pandemic. More recently, FAO and the World Food Programme (WFP) project that approximately 295 million people across 53 countries will experience acute food insecurity in 2026. These statistics demonstrate that food insecurity remains a persistent global challenge despite decades of policy interventions and international commitments aimed at achieving Sustainable Development Goal Two (SDG 2), which seeks to end hunger and ensure food security for all.

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The challenge is particularly severe in sub-Saharan Africa, particularly in Nigeria, Being Africa's most populous nation, has become one of the countries most affected climate variability, insecurity, weak agricultural systems, and macroeconomic instability continue to undermine food production and access to food.

Agriculture remains the backbone of food security in most developing economies because it provides food, employment, income, foreign exchange earnings, and raw materials for industries. Von Braun (1995) argued that agricultural growth represents one of the most effective pathways for reducing poverty and improving food security. In Nigeria, agriculture contributes between 22 and 25 percent of Gross Domestic Product (GDP) and employs approximately 35 percent of the labour force, while serving as the principal livelihood source for rural households (Federal Ministry of Agriculture and Food Security, 2024). However, the performance of the agricultural sector depends largely on the level of government support, investment, access to finance, favourable climatic conditions, and a peaceful production environment.

Government expenditure on agriculture constitutes one of the most important fiscal instruments for promoting agricultural development and food security. It includes public spending on agricultural policies and programmes, irrigation infrastructure, extension services, research and development, fertilizer subsidies, pest and disease control, rural infrastructure, and other interventions designed to enhance agricultural productivity (Agbana & Ebisine, 2022). Adeyemi and Ogunsola (2022) argued that public agricultural expenditure addresses market failures, stimulates private investment, and improves agricultural productivity. Likewise, FAO (2020) emphasized that increased investment in agriculture raises food production, improves farmers' incomes, reduces poverty and hunger, and promotes environmentally sustainable agricultural development.

Beyond government expenditure, agricultural financing through the Agricultural Credit Guarantee Scheme Fund (ACGSF) plays a vital role in improving farmers' access to credit, facilitating investment in modern farming technologies, increasing productivity, and strengthening food availability. At the same time, rainfall variability significantly influences agricultural output because Nigerian agriculture remains predominantly rain-fed. Furthermore, the increasing incidence of terrorism and armed conflicts has displaced farming communities, destroyed agricultural assets, disrupted food supply chains, and reduced agricultural production, particularly in northern Nigeria. Collectively, these factors influence the four dimensions of food security, namely food availability, accessibility, utilization, and stability.

Recognising the strategic importance of agriculture, successive Nigerian governments have implemented numerous agricultural policies and intervention programmes. These include Operation Feed the Nation (1976), the Green Revolution Programme (1979–1983), the Land Use Act (1978), the establishment of the National Fertilizer Company of Nigeria (NAFCON) in 1983, the National Agricultural Land Development Authority (NALDA) in 1992, the Agricultural Credit Guarantee Scheme Fund (ACGSF), the Anchor Borrowers' Programme, fertilizer subsidy programmes, and several tax and tariff waivers on selected food imports aimed at boosting domestic food production and improving food security.

Government financial commitment to agriculture has increased considerably in nominal terms over time. According to the Central Bank of Nigeria Statistical Bulletin (2024), agricultural expenditure amounted to approximately ₦172.84 billion between 1986 and 1990, ₦564.99 billion during 1991–2000, ₦783.29 billion during 2001–2010, ₦878.18 billion between 2011 and 2020, and ₦483.26 billion between 2021 and 2024, resulting in cumulative expenditure of approximately ₦2.88 trillion over the study period. However, despite these nominal increases, public investment in agriculture has remained consistently below the 10 percent budgetary

allocation recommended under the Comprehensive Africa Agriculture Development Programme (CAADP). Agricultural expenditure averaged about 4 percent of total federal expenditure during 1981–1984, increased to 5.76 percent in 1985, peaked at approximately 5.8 percent in 2009, declined sharply to 0.9 percent in 2015, and remained between one and two percent from 2016 to 2023. This suggests that government investment in agriculture has remained inadequate relative to the sector's strategic importance.

The consequences of inadequate investment are reflected in the fluctuating performance of Nigeria's agricultural sector. Agriculture contributed approximately 55.8 percent of GDP during the 1960s but declined substantially following the oil boom. According to the National Deposit Insurance Corporation (NDIC, 2024), agriculture contributed an average of 32.3 percent of GDP between 1981 and 1990, approximately 37 percent in 1990 and 1994, about 27 percent in 2000, and fluctuated between 20 and 26 percent from 2014 to 2023. These fluctuations reflect the combined effects of inconsistent policy implementation, inadequate public investment, insecurity, climate-related shocks, and structural weaknesses within the agricultural sector.

Consequently, Nigeria continues to experience one of the most severe food insecurity crises globally. Recent assessments by the Food and Agriculture Organization and the World Food Programme indicate that approximately 34.7 to 35 million Nigerians are projected to experience acute food insecurity during the 2026 lean season, representing the highest level recorded in more than a decade. This persistent deterioration in food security, despite increasing government expenditure and numerous agricultural intervention programmes, raises important questions regarding the effectiveness of agricultural fiscal policy and related support mechanisms.

Although numerous studies have examined food security in Nigeria, most have focused on agricultural output, poverty reduction, or economic growth, with limited attention to the combined effects of government agricultural expenditure, the Agricultural Credit Guarantee Scheme Fund (ACGSF), rainfall, and terrorism on food security. Moreover, many studies relied on outdated data or overlooked the growing influence of climate and security challenges. Consequently, empirical evidence integrating fiscal policy, agricultural finance, climatic conditions, and insecurity within a comprehensive food security framework remains limited.

It is against this background that this study seeks to examine the effect of government agricultural expenditure, the Agricultural Credit Guarantee Scheme Fund (ACGSF), rainfall level, and terrorism perception on food security in Nigeria. Specifically, the study seeks to determine the extent to which these factors influence food security outcomes in the country. The study, therefore, raises the following research question: To what extent do government agricultural expenditure, the Agricultural Credit Guarantee Scheme Fund (ACGSF), rainfall level, and terrorism perception influence food security in Nigeria?

2 Literature Review

2.1 Conceptual review

2.1.1 Government expenditure on agriculture

Government expenditure on agriculture refers to public financial resources allocated to support agricultural production and rural development through budgetary spending on agricultural research, extension services, irrigation, mechanization, input subsidies, rural infrastructure, pest control, and institutional support (Buari et al., 2020; Pernechele et al., 2021)

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Public investment in agriculture is widely recognized as an important policy instrument for increasing food production, reducing rural poverty, and promoting sustainable agricultural development (FAO, 2020; Agbana & Ebisine, 2022).

In this study, government expenditure on agriculture represents the financial commitment of the Nigerian government to agricultural development and is expected to positively influence food production and food security.

2.1.2 Food Security

Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that satisfies their dietary needs and food preferences for an active and healthy life (Osu, 2017; FAO, 2023). The concept extends beyond food availability to include equitable access, effective utilization, and stability of supply over time.

According to the FAO, food security comprises four interrelated dimensions: food availability, food access, food utilization, and food stability. These dimensions collectively determine the ability of individuals and households to maintain adequate nutrition despite economic or environmental shocks.

This study measures food security using the Food Production Index (FPI), which captures changes in domestic food production over time. The index serves as a proxy for food availability and reflects the capacity of the agricultural sector to meet national food demand.

2.1.3 Agricultural Credit Guarantee Scheme Fund

The Agricultural Credit Guarantee Scheme Fund (ACGSF) is a government-supported credit guarantee programme established to encourage financial institutions to extend loans to agricultural producers by reducing lending risks (Adetiloye, 2012; Nyam, 2020). The scheme facilitates access to finance for farmers and agribusinesses, thereby promoting investment, technological adoption, and agricultural productivity.

By sharing credit risks between government and lending institutions, the ACGSF enhances financial inclusion within the agricultural sector and stimulates increased production and rural development (Ahmed & Yusuf, 2020; Idris & Samaila, 2023).

Although the ACGSF does not constitute direct government expenditure, it represents an important government financial intervention. Accordingly, this study employs the value of guaranteed agricultural credit as government financial support to agriculture.

2.2.4 Average Rainfall Level

Rainfall is one of the most important climatic factors influencing agricultural production, particularly in Nigeria where farming is predominantly rain-fed. Variations in rainfall affect planting dates, crop growth, yields, and overall food production.

The average rainfall level captures long-term changes in precipitation patterns associated with climate variability. According to the IPCC, persistent changes in rainfall distribution, intensity, and frequency constitute important indicators of climate change. In Nigeria, delayed rainfall, prolonged dry spells, floods, and erratic precipitation have increasingly disrupted agricultural production and threatened food security (APS, 2021).

In this study, average rainfall is incorporated as a measure of climate variability to examine its influence on food production in Nigeria.

2.1.5 Terrorism Perception Index

Terrorism refers to the deliberate use or threat of violence by non-state actors to achieve political, ideological, or religious objectives (Fishman & Kruglanski, 2006). In Nigeria, terrorism, insurgency, banditry, and farmer–herder conflicts have become major constraints to agricultural production by displacing farming households, destroying farmlands and infrastructure, and disrupting rural livelihoods (Ogundipe & Ogunniyi, 2023).

The Terrorism Perception Index, measured using the Global Terrorism Index (GTI), provides a composite measure of the intensity and impact of terrorism based on indicators such as the number of incidents, fatalities, injuries, and property damage. Higher terrorism levels increase production risks, discourage investment, reduce cultivated land, and ultimately undermine food production and food security.

2.2 Empirical Review

Empirical evidence indicates that government expenditure on agriculture plays a significant role in improving food security in Nigeria. Studies by Okoli et al. (2026), Nnajeze (2026), and earlier works by Adeniyi and Olufemi (2021) generally found that government spending on agriculture stimulates agricultural production and enhances food availability, although Nnajeze (2026) reported that the effect of agricultural expenditure on food security was positive but statistically insignificant, suggesting that inadequate funding and poor budget implementation weaken its effectiveness.

Regarding agricultural credit, scholars such as Nwosu et al. (2023), Abolade et al. (2025), and Okeke and Eze (2022) reported that access to agricultural credit, particularly through the Agricultural Credit Guarantee Scheme Fund (ACGSF), increases farmers' access to improved inputs, technology, and mechanization, thereby raising agricultural productivity and strengthening food security. However, these studies also noted that bureaucratic bottlenecks, inadequate loan disbursement, and limited access by smallholder farmers constrain the effectiveness of agricultural credit interventions.

Empirical studies on climatic factors consistently identify rainfall as a key determinant of food security. Scholars such as Adebayo et al. (2022), Ibrahim et al. (2024), and Ajayi and Oyekunle (2026) found that adequate and well-distributed rainfall improves crop yields and food availability, whereas rainfall variability, flooding, and drought reduce agricultural productivity and increase food insecurity. These findings underscore the importance of climate-resilient agricultural policies and irrigation investments.

Similarly, studies by Ijirshar et al. (2025), Aamo et al. (2021), and other researchers established that terrorism and insecurity significantly undermine food security by displacing farmers, reducing cultivated land, destroying farm assets, disrupting food supply chains, and increasing food prices. The literature therefore concludes that achieving sustainable food security requires not only increased agricultural investment but also improved national security.

Overall, the empirical literature demonstrates that government expenditure on agriculture, agricultural credit, rainfall, and terrorism perception are important determinants of food security. However, most previous studies examined these variables separately or focused on agricultural output rather than food security. Furthermore, limited studies have simultaneously incorporated government agricultural expenditure, agricultural credit, rainfall, and terrorism perception within a single empirical model. This gap provides the motivation for the present study.

2.3 Theoretical Framework

This study is anchored on the Food Entitlement Theory developed by Amartya Sen (1981), complemented by the Agricultural Development Theory and Sustainable Livelihood Theory. Together, these perspectives explain how government intervention, access to productive resources, environmental conditions, and security shape food security outcomes.

Food Entitlement Theory posits that food insecurity arises not only from inadequate food production but also from limited access to food. According to Sen (1981), food security depends on individuals' ability to obtain food through production, exchange, labour, or public support. In this context, government expenditure on agriculture and the Agricultural Credit Guarantee Scheme Fund (ACGSF) strengthen farmers' productive capacity and improve access to food, while favourable rainfall enhances food availability. Conversely, terrorism disrupts agricultural production, market access, and food distribution, thereby weakening food entitlement and worsening food insecurity. While, The Agricultural Development Theory, advanced by John Mellor and W. Arthur Lewis, emphasizes agriculture as the foundation of economic development in developing economies. The theory argues that public investment in agricultural infrastructure, research, extension services, irrigation, and rural finance increases agricultural productivity and food production. It further recognizes that favourable climatic conditions promote agricultural output, whereas insecurity discourages investment and reduces farm productivity. More so, The Sustainable Livelihood Theory, developed by the Department for International Development (DFID) and refined by Robert Chambers and Gordon Conway, complements these perspectives by emphasizing that sustainable food security depends on access to human, financial, natural, physical, and social capital. Government expenditure and agricultural credit strengthen livelihood assets, rainfall supports natural capital, while terrorism erodes productive assets and livelihoods, thereby undermining food security.

Collectively, these theories provide a coherent framework for analyzing the effects of government agricultural expenditure, agricultural credit, rainfall, and terrorism on food security in Nigeria. They suggest that sustainable food security depends on effective public investment, improved access to agricultural finance, favourable environmental conditions, and a secure production environment.

2.4 Literature Gap

Despite the growing literature on agricultural expenditure and food security in Nigeria, important gaps remain. First, most studies proxy food security using agricultural output, agricultural GDP, or calorie supply rather than the Food Production Index (FPI), which provides a more consistent measure of domestic food availability over time (Akpan & Akpanabah, 2022; Okwuchukwu, 2022; Reuben et al., 2020; Yusufu, 2022). Second, existing studies largely examine government agricultural expenditure, agricultural credit, rainfall, insecurity, and population growth separately, with limited evidence on their combined effects on food security.

The literature also exhibits theoretical and methodological limitations. Most studies are anchored on production, credit, or conflict theories and employ linear estimation techniques, with data ending between 2018 and 2022. Consequently, they do not adequately capture the recent effects of climate variability, terrorism, and population pressure on food security.

This study addresses these gaps by integrating government agricultural expenditure, the Agricultural Credit Guarantee Scheme Fund (ACGSF), average rainfall, terrorism, and population growth within a single ARDL framework using the Food Production Index as a

direct measure of food security. By extending the analysis to 2024, the study provides more current and policy-relevant evidence on the determinants of food security in Nigeria.

3. Methodology

3.1 Research Design

This study adopts an ex-post facto research design. The design is appropriate because it relies on historical macroeconomic time-series data and examines relationships among variables without manipulating them. It enables the investigation of the long-run and short-run effects of government agricultural expenditure, Agricultural Credit Guarantee Scheme Fund (ACGSF), average rainfall, terrorism perception, and population growth on food security in Nigeria.

3.2 Sources of Data

The study utilizes annual secondary data covering the period 1986–2023. Data on the Food Production Index is obtained from the World Development Indicators published by the World Bank. Data for government expenditure on agriculture and the Agricultural Credit Guarantee Scheme Fund were sourced from the Central Bank of Nigeria Statistical Bulletin. Average annual rainfall data are obtained from the Nigerian Meteorological Agency (NiMet), while terrorism perception data are sourced from the Global Terrorism Index published by the Institute for Economics and Peace.

3.3 Model Specification

Following the theoretical framework and empirical literature, food security is specified as a function of government agricultural expenditure, Agricultural Credit Guarantee Scheme Fund, average rainfall, terrorism perception, and population growth. The functional relationship is expressed as:

$$FS = f(GEA, ACGSF, RAINF, TPI,) \quad 1$$

Where,

FS = food security (proxied by food production index)

GEA = government expenditure on agriculture

ACGSF = agricultural credit guarantee scheme fund

RAINF = average rainfall level

TPI = terrorism perception (proxies by global terrorism index)

Equation (1) is further expressed from functional model into econometric equation as;

$$FSt = \beta_0 + \beta_1 GEAt + \beta_2 ACGSFt + \beta_3 RAINFLt + \beta_4 TPIt + \epsilon_t \quad 2$$

Equation (2) is transformed into log form to reduce the data into a sizeable measurement which has a common based for adequate interpretation of elasticities

$$\log FSt = \beta_0 + \beta_1 GEAt + \beta_2 \log ACGSFt + \beta_3 \log RAINFLt + \beta_4 \log TPIt + \epsilon_t \quad 3$$

The log form of the variable is to reduce the magnitude of the values to a manageable size and for a more robust result. The elasticities of the variables are obtained to reduce the high values of the variables into a manageable size.

logFS = log Food security is proxied by food production index

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logGEA = log government expenditure on agriculture

logACGSF = log agricultural credit guarantee scheme fund

LogRAINF= average rainfall level

logTPI = log terrorism perception index which is proxied for global terrorism index

ϵ_t = Error Term at time t

Log = Natural Logarithm

β_0 = Constant term

β_1 – β_5 = Parameters to be estimated

μ = Stochastic error term

Based on theoretical expectations: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 < 0$, $\beta_5 < 0$

3.4 Estimation techniques

The study adopts the Autoregressive Distributed Lag (ARDL) modelling approach developed to examine the short-run and long-run effects of government expenditure on agriculture and food security in Nigeria. The ARDL technique is appropriate because it accommodates variables integrated of order I (0) and I (1), performs efficiently with relatively small sample sizes, and estimates both short-run and long-run relationships within a unified framework.

The empirical analysis follows a sequential procedure. First, descriptive statistics are computed to examine the distributional properties of the variables. Second, the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests are employed to determine the order of integration. The ADF test is specified as:

$$\Delta \log Y_t = \alpha_0 + \log Y_{t-1} + \sum_{i=1}^n \alpha_i \Delta \log Y_{t-i} + \delta_t + \epsilon_t \quad 6$$

Where, Y is a time series, t is a linear time trend, Δ is the first difference operator, ϵ_t is a pure white noise error term, α_0 is a constant, log is logarithm and n is the optimum number of lags in the dependent variable. If the time series variables are non-stationary at level and integration then it becomes important indication of co-integration within the model.

Given the mixed integration order of the variables, the ARDL Bounds Test is conducted to establish the existence of a long-run equilibrium relationship. Where cointegration is confirmed, the long-run coefficients and the associated Error Correction Model (ECM) are estimated to capture both the long-run equilibrium effects and the short-run speed of adjustment to equilibrium.

The robustness of the estimated model is assessed using standard diagnostic tests, including the Breusch–Godfrey LM test for serial correlation, Breusch–Pagan test for heteroskedasticity, Jarque–Bera test for normality, Ramsey RESET test for model specification, and the CUSUM and CUSUMSQ tests for parameter stability. These tests ensure the validity, stability, and reliability of the estimated ARDL model.

4. Results and Discussion

The desire to empirically examine the impact of agricultural government expenditure on food security in Nigeria, led the researcher to subject the data collected to unit root test and

dynamic auto-regressive distributed lag (ARDL) model. The variables considered in this research work are: food production index (FPI-dependent variable) and the independent variables include, government expenditure on agriculture (GEA), agricultural credit guarantee scheme funds (ACGSF), average rainfall (RAINF) and terrorism perception index (TPI). The empirical results are presented below:

4.1 Unit Root Test

In order to test for the presence or absence of unit root in the data used for the empirical analysis, Augmented Dickey-Fuller (ADF) and Philip Perron (PP) unit root tests were employed and the test results are as presented below:

Table 1: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variables	Level			First Difference			Remarks
	t-Statistics value	5% critical value	p-value	t-statistics value	5%-critical value	p-value	
lnFPI	-2.128361	-2.945842	0.2352	-8.184624	-2.943427	0.0000	I(1)
lnGEA	-1.689548	-2.941145	0.4283	-6.887532	-2.943427	0.0000	I(1)
lnACGS	-1.100406	-2.941145	0.7058	-5.469385	-2.943427	0.0001	I(1)
lnRAINF	-1.388680	-2.941145	0.5776	-6.711996	-2.943427	0.0000	I(1)
TPI	-3.666694	-2.945842	0.0031	-----	-----	-----	I(0)

Sources: Researcher's computation from E-View 10

The Augmented Dickey Fuller (ADF) unit root test as presented in table 1, revealed that, terrorism perception index (TPI) was stationary at level whereas food production index (FPI), government expenditure on agriculture (GEA), agricultural credit guarantee scheme funds (ACGSF) and average rainfall (RAINF) were stationary at first difference. This ADF unit root test results therefore revealed the existence of a mixed order of integration among the variables of the study. However, further confirmation about the stationarity of these variables is carried out using Philips's perron.

Table 2: Philips-Perron Unit Root Test Results

Variables	Level			First Difference			Remarks
	t-Statistics	5% critical value	p-value	t-statistics	5%-critical value	p-value	
LFPI	-5.308298	-2.941145	0.0001	-----	-----	-----	I(0)
LGEA	-1.726989	-2.941145	0.4100	-6.856326	-2.943427	0.0000	I(1)
LACGS	-1.101617	2.941145	0.7053	-5.448986	-2.943427	0.0001	I(1)
LRAINF	-2.025869	-2.941145	0.2750	-7.214479	-2.943427	0.0000	I(1)
TPI	-3.131397	-2.941145	0.0326	-----	-----	-----	I(0)

Sources: Researcher's computation from E-View 10

In table 2, the Phillips Perron (PP) unit root test, revealed that food production index (FPI) and terrorism perception index (TPI) were stationary at level, whereas, government expenditure on agriculture (GEA), agricultural credit guarantee scheme funds (ACGSF) and average rainfall (RAINF) were stationary at first difference. This Phillips Perron unit root test results equally confirms the existence of a mixed order of integration among the variables of the study. This

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mixed order of integration from the unit root test results implies the possibility of long-run relationship among the variables of the study, though further investigations using ARDL bound test result will reveal if actually long run relationship exist among the variables of the study.

4.2 ARDL Bound Test

The bound test is used to examine whether the variables are co integrated. The variables are said to be co integrated if the F-statistics is greater than the critical values and otherwise if it is less. The result of Bounds test is presented in the Table 4 as follows:

Table 3: Bound Test Result

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	15.18443	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Sources: Researcher's computation from E-View 10

The results of the bound test presented in Table 3 shows that a long-run relationship exists between agricultural government expenditure and food security in Nigeria within the periods of the study. The result disclosed that the computed *F* value of (15.18443) is greater than 3.49 upper critical value at 5% level of significance, the null hypothesis is therefore rejected. That is, the null hypothesis of no long-run relationship existing between agricultural government expenditure and food security is rejected at a 5% level of significance.

4.3 ARDL Short-Run Results

The evidence of equilibrium long-run relationship revealed by ADRL bound test among the variables; prompted the investigation of the coefficients of the short-run and long-run of the variables employed in the study using the ARDL short-run and long-run coefficients test with the objective of ascertaining the elasticity or magnitude of the parameters. The results as estimated are presented in table 4 and 5 of chapter four below.

Table 4: ARDL Short-run Coefficients Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.468724	0.308507	1.519330	0.1395
LFPI(-1)*	-0.080113	0.098485	-0.813455	0.4226
LGEA**	0.024785	0.010161	2.439222	0.0211
LACGSF**	0.003514	0.007278	0.482760	0.6329
TPI**	-0.000951	0.003255	-0.292109	0.7723
D(LRAINF)	0.048768	0.024307	2.006309	0.0042

$R^2 = 0.991365$; $\text{Adj } R^2 = 0.989281$

Sources: Researcher's computation from E-View 10

Table 4 illustrates the short-run coefficients test results of the ARDL model. The results indicated that government expenditure on agriculture (GEA), with the coefficient of 0.024785 and p-value of 0.0211, has positive and significant impact on food production index in Nigeria in the short-run. However, the coefficient of agricultural credit guarantee scheme funds

(ACGSF) being 0.003514 with associated p-value of 0.6329, implies positive association between government expenditure on agriculture and food production index; but, statistically not significant in the short-run in Nigeria. In the same vein, considering terrorism perception index (TPI) with the coefficient of -0.000951 and associate p-value of 0.7723, we deduce that terrorism perception index (TPI), has negative and insignificant impact on food production index in Nigeria in the short-run. indicating a serious hunger situation.

On the contrary, the coefficient of rainfall level (RAINL) being 0.048768, with associated p-value of 0.0042, indicated that average rainfall (RAINL), has positive and significant impact on food production index in Nigeria in the short-run.

The above result shows that the R^2 is 0.991365, which implies that about 99.1365% of the total variations in food production index (FPI) are explained by the independent variables (government expenditure on agriculture, agricultural credit guarantee scheme funds, average rainfall level and terrorism perception index) during the period of the study. While the remaining 0.86346% variations are as a result of other explanatory variables that are not captured in the model.

4.4 Long Run Results

The long run relationship between agricultural government expenditure and food security in Nigeria is assessed by the upper part of the result of Autoregressive Distributed Lagged (ARDL). The result is presented as following in the Table 6:

Table 5: ARDL Long-run Coefficients Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGEA	1.254341	0.472485	2.654774	0.0178
LACGSF	0.025347	0.007278	3.486519	0.0029
LRAINF	0.600939	0.283532	2.119475	0.0021
TPI	-0.011867	0.043333	-0.273864	0.7861
C	5.850750	3.570123	1.638809	0.1121

Sources: Researcher's computation from E-View 10

Table 5 reveals the long-run coefficients test results of the ARDL model for which the variables under consideration were estimated. From the long run results, it is discovered that government expenditure on agriculture (GEA), with the coefficient of 1.254341 and p-value of 0.0178, has positive and significant impact on food production index in Nigeria in the long-run. Similarly, the coefficient of agricultural credit guarantee scheme funds (ACGSF) being 0.025347 with associate p-value of 0.0029, implies positive relationship between government expenditure on agriculture and food production index; and as well, statistically significant in the long-run in Nigeria.

In the same vein, considering the coefficient of average rainfall (RAINL) being 0.600939, with associated p-value of 0.0021, indicated that average rainfall (RAINL), has positive and significant impact on food production index in Nigeria in the long-run. However, the terrorism perception index (TPI) with the coefficient of -0.011867 and associate p-value of 0.7861, has negative and insignificant impact on food production index in Nigeria in the short-run.

4.5 Diagnostic Tests

The diagnostic test is employed to validate the ARDL model results in which the serial correlation, heteroscedasticity and error specifications were tested for stability through the applications of the Breusch-Godfrey serial correlation LM Test, ARCH heteroskedasticity Test

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and Ramsey RESET test. These diagnostic tests were utilized to determine whether the parameters of the model possessed goodness of fit for the investigation as suggested by Pesaran and Pesaran (1997). The results are presented in the table 5 below:

Table 6: Post Estimation Test Results

Test	F-statistic	DF	p-value
Breusch-Godfrey Serial Correlation LM Test	0.708876	2,27	0.5011
Heteroskedasticity Test	1.023093	7,29	0.4363
Ramsey RESET Test	0.021343	1, 28	0.8849

Sources: Researcher's computation from E-view 9

The results of post estimation test in table 5 above revealed that there was no presence of serial correlation, because the probability value of F-statistic is higher than 5 percent level of significant. The Breusch-Pagan-Godfrey test of Heteroskedasticity also revealed that the residual is homoskedastic, because the probability of F statistic is higher than 5 percent level of significant. Similarly, the probability of Ramsey RESET Test is greater than 0.05 suggesting that the residual is normally distributed at 5 percent level of significant.

4.6 Discussion of findings

4.6.1 Impact of Government Expenditure on Agriculture on Food Security in Nigeria

This objective deals with determining the extent to which government expenditure on agriculture affects food production in Nigeria within the period of study 1986-2024. In effort to attain this objective, results obtained using the short-run and long-run ARDL coefficients were utilized. From the result, the coefficient of government expenditure on agriculture in the short-run is (0.024785) and its p-value is (0.0211); while in the long-run, the coefficient and p-value of the government expenditure on agriculture variable are (1.254341) and (0.0178) respectively. These results show that government expenditure on agriculture at 5 percent critical value has a positive and significant impact on food production both in the short-run and the long-run. Thus, the study estimated on the average that 1% increase in government expenditure on agriculture resulted to 0.025% increase in food production in the short-run and 1.3% rise in food production in the long-run in Nigeria.

The above results are in line with Keynesian theory, pioneered by John Maynard Keynes, which argues that government spending acts as an exogenous tool to stimulate economic activity, boost aggregate demand, and, by extension, enhance output in specific sectors, such as agriculture.

Empirically, the results are in accordance with the discoveries of Oshim and Nnajieze (2024), Okwuchukwu (2022) etc. These scholars carried out research on the impact of government expenditure on agriculture on food supply across their respective countries and found that government expenditure on agriculture had a positive effect on food supply in the various nations of the investigation.

4.6.2 Extent of Effect of Agricultural Credit Guarantee Scheme Funds on Food Security in Nigeria

The objective two investigated the significant effect of agricultural credit guarantee scheme funds on food production in Nigeria within the period of study. In order to realize this objective, the results estimated through the application of the ARDL short-run and long-run coefficients and their respective probability values were used.

From the results, the coefficient of agricultural credit guarantee scheme funds is 0.003514, and its p-value is 0.6329 in the short run. In the long-run, the coefficient and p-value of agricultural credit guarantee scheme funds are 0.025347 and 0.0029, respectively. These results imply that agricultural credit guarantee scheme funds at 5 percent critical value have positive effect on food production both in the short-run and the long-run in Nigeria. Hence, the research estimated averagely that 1% increase in agricultural credit guarantee scheme funds will encourage food production by 0.004% and 0.03% in the short-run and long-run respectively. The positive sign indicated by the coefficient of agricultural credit guarantee scheme funds satisfied theoretical postulation (financial intermediation theory), which argues that financial institutions play a crucial role in economic growth by channeling funds from savers (surplus units) to investors (deficit units), such as farmers. This suggests that agricultural credit guarantee scheme funds act as a catalyst by mitigating risk for lenders (guaranteeing 75% of loans in default), encouraging them to provide much-needed capital to the agricultural sector.

Empirically, the results are in line with the findings of Zakaree et al. (2022), Akpan and Akpanabah (2022), Okwuchukwu (2022) etc, who examined the influence of agricultural credit guarantee scheme funds in their various countries and discovered that agricultural credit guarantee scheme funds had a significant and positive influence on food supply.

4.6.3 Magnitude of Effect of Average Rainfall on Food Security in Nigeria

This objective deals with determining the extent to which average rainfall impact on food production in Nigeria within the period of study. In order to realize this objective, the results estimated through the application of the ARDL short-run and long-run coefficients and their respective probability values were used.

From the results, the coefficient of average rainfall is 0.048768, and its p-value is 0.0042 in the short run. In the long-run, the coefficient and p-value of average rainfall are 0.600939 and 0.0021, respectively. These results imply that average rainfall at 5 percent critical value has positive effect on food production and statistically significant both in the short-run and the long-run in Nigeria. Hence, the research estimated averagely that 1% increase in average rainfall will increase food production by 0.05% and 0.6% in the short-run and long-run respectively.

The positive sign indicated by the coefficient of average rainfall satisfied theoretical postulation (Ricardian approach, which relates agricultural productivity to climate variables like rainfall and temperature. It is equally in line with Malthusian-based theory which posits that food security depends directly on food availability, which is heavily influenced by agricultural production. In this context, adequate rainfall is a crucial input for rain-fed farming, which covers roughly 97% of cropland in sub-Saharan Africa. Increased rainfall, up to a certain threshold, directly increases crop yields and, by extension, food supply.

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Empirically, the results are in line with the findings of Ogbodo, Uche and Edeh (2020), Sunday, Samuel et al, (2021), etc, who discovered that average rainfall had a significant and positive influence on food supply in the various economies of the study.

4.6.4 Extent of Effect of Terrorism Perception Index on the Food Security in Nigeria

In order to realize this objective, the results estimated through the application of the ARDL short-run and long-run coefficients and their respective probability values were used to investigate the significant effect of terrorism perception index on food production in Nigeria.

From the results, the coefficient of terrorism perception index variable is -0.000951, and its p-value is 0.7723 in the short run. In the long-run, the coefficient and p-value of terrorism perception index are -0.011867 and 0.7861, respectively. These results imply that terrorism perception index at 5 percent critical value has negative effect on food production and statistically not significant both in the short-run and the long-run in Nigeria. Hence, the research estimated averagely that 1% increase in terrorism perception index will discourage food production by 00.0009% in the short-run and 0.012% in the long-run.

The negative sign indicated by the coefficient of terrorism perception index satisfied theoretical postulation (Conflict theory of food security), also linked to the vicious cycle of violence and hunger framework, which postulate that high levels of terrorism and perceived risk lead to a "conflict trap," causing significant disruption to the food supply chain and agricultural output. Empirically, the results are in line with the findings of Onunze (2012), Chan, et al, (2021), etc, who discovered that terrorism perception index discourages food supply.

5.1 Summary of Findings

The study investigated the impact of agricultural government expenditure on food security in Nigeria for the period of 1986 to 2024. Having estimated and analyzed the empirical result in chapter four of this study using Autoregressive Distributed lag (ARDL) model, after conducting unit root test using Augmented Dickey-Fuller (ADF) and Phillip-Peron (PP) tests statistic. Both ADF and PP revealed the existence of mixed order of integration ranging from 1(0) and 1(1). However, none of the variables was stationary at the second difference. The bound test result revealed that the presence of a long-run relationship existing between agricultural government expenditure and food security in Nigeria. Hence, the summary of findings is stated as thus:

- 1) Government expenditure on agriculture enhances food security in short run and long run.
- 2) ACGSF significantly leads to rise in food security
- 3) ARF promotes food security both in the short run and long run.
- 4) Terrorism results insignificantly affect food security in the short run and long run.

5.2 Conclusion

This study examined the impact of government expenditure on agriculture on food security in Nigeria using ARDL approach. The findings confirmed a long-run equilibrium relationship among the variables. Government expenditure on agriculture, the agricultural credit guarantee scheme fund (ACGSF), and rainfall level exert positive effects on food security, while the terrorism perception index had a negative effect. The result underscore the importance of

sustained public investment in agriculture, improved access to agricultural credit, climate-resilient agricultural policies, and enhanced rural security as critical measures for strengthening food security in Nigeria.

Thus, the long-run impacts of agricultural government expenditure on food security in Nigeria are stated as follows:

- (a) A percentage increase in government expenditure on agriculture in the long run brought about a 1.3% increase in food security in Nigeria, and vice versa.
- (b) One percentage increase in agricultural credit guarantee scheme funds brought about a 0.03% increase in the food security in Nigeria, and vice versa.
- (c) One percentage increase in average rainfall in the country brought about an approximately 0.6% increase in the food security in Nigeria, and vice versa.
- (d) A percentage increase in terrorism perception index in the long run brought about a 0.012% decrease in the food security in Nigeria, and vice versa.

5.3 Recommendations

Based on the empirical findings the following recommendations are made in line with the objectives of this analysis as:

1. Since government expenditure on agriculture exerts positive and significant effect on food security in Nigeria in both the short-run and the long-run, the government should increase investment in agricultural research, innovation, and extension services to enhance productivity and food availability.
2. Given that agricultural credit guarantee scheme fund (acgsf) positively and significantly improves food security, effort should focus on expanding credit access for smallholder farmers, simplifying loan procedures, and strengthening monitoring mechanisms to ensure efficient utilization of funds.
3. As rainfall level exert positive and significant influence on food security in Nigeria, government should complement favourable rainfall with investment in irrigation infrastructure and climate-smart agricultural practices to reduce the adverse effect of rainfall variability.
4. Although the terrorism perception index showed a negative but statistically insignificant effect on food security in Nigeria, the government should strengthen rural security through targeted protection of farming community to safeguard agricultural production and encourages sustained investment in farming.

References

- Aaron, A., Baidya, A., Wang, J., Chan, C., Wetzler, E., & Kang, Y. (2021). The early impacts of COVID-19 on food security and livelihood in Vietnam. *Frontiers in Sustainable Food Systems*, 5, 739140. <https://doi.org/10.3389/fsufs.2021.739140>
- Abolade, A. P., Lawal, I. O., Akanbi, K. L., & Salami, A. O. (2025). Unlocking the future of food security through access to finance for sustainable agribusiness performance. *arXiv*. <https://doi.org/10.48550/arXiv.2511.18576>
- Olufemi, A. M., & Adeniyi, O. B. (2021). Food insecurity and its determinants among farming households in Surulere Local Government Area of Oyo State, Nigeria. *South Asian Research Journal of Agriculture and Fisheries*, 3(2), 10–16
- Adebayo, O., & Olaniyi, O. (2023). Farmer–herder conflicts and agricultural GDP in Nigeria. *Journal of Peace and Development Studies*, 10(1), 22–36.

Onyibe, O. C. (2026). Government Expenditure on Agriculture and Food Security in Nigeria.

- Amao, I. O., Ogunniyi, A. I., Mavrotas, G., & Omotayo, A. O. (2023). Factors affecting food security among households in Nigeria: The role of crop diversity. *Sustainability*, 15(11), 8534. <https://doi.org/10.3390/su1511853>
- Adetiloye, K. A. (2012). Agricultural financing in Nigeria: An assessment of the Agricultural Credit Guarantee Scheme Fund (ACGSF) for food security in Nigeria (1978–2006). *Journal of Economics*, 3(1), 39–48. <https://doi.org/10.1080/09765239.2012.11884951>
- Ajayi, O. M., & Oyekunle, T. B. (2026). An analysis of economic disempowerment as a fundamental barrier to food security and education access in Nigeria. *Frontiers in Sustainable Food Systems*, 10, 1800476. <https://doi.org/10.3389/fsufs.2026.1800476>
- Agbana, B. T., & Lubo, E. (2021). Impact of government expenditure on agriculture in Nigeria: A sub-sector analysis. *Nigerian Journal of Agriculture, Food and Environment*, 17(2), 121–128.
- Agbana, E. Z., & Lubo, E. (2022). Government expenditure on agriculture and economic growth in Nigeria. *Journal of Good Governance and Sustainable Development in Africa*, 7(2), 47–60.
- Ahmed, F. F., Yusuf, A. B., & Ahmed, E. A. (2020). Impact of enhanced agricultural credit flow under the Agricultural Credit Guarantee Scheme Fund (ACGSF) on economic growth in Nigeria. *Journal of Agricultural Economics, Environment and Social Sciences*, 6(2), 55–70.
- Akpan, J. E., & Akpanabah, U. B. (2022). Government spending and agricultural output in Nigeria. *International Journal of Education and Social Science Research*, 5(4), 325–361.
- Amadi-Robert, T., Ekwe, E. E., & Nweke, C. (2024). Effect of insecurity on agriculture sector performance in Nigeria. *Journal of Agricultural Economics and Development*, 43(2), 215–230.
- Buari, A. A., Alexander, A. A., Saheed, Z. S., & Alfa, Y. (2020). Impact of government expenditures in agriculture and education on economic growth in Nigeria: A disaggregated analysis. *International Journal of Innovative Finance and Economics Research*, 8(1), 177–188.
- CBN annual statistical bulletins (2023) <https://www.cbn.gov.ng/DFD/agriculture/ACGSF.html>
- Central Bank of Nigeria. (2024). Statistical bulletin 2023. CBN.
- Food and Agriculture Organization of the United Nations. (2023). The state of food and agriculture 2022. FAO.
- Ijirshar, V. U., Udaah, I. I., Mile, B. N., Vershima, J. S., & Adaudu, A. (2025). Effect of insecurity on agricultural output in Benue State, Nigeria. *arXiv*. <https://doi.org/10.48550/arXiv.2506.01525>
- IndexMundi. (2020). Nigeria agricultural data. <https://www.indexmundi.com>

- IndexMundi. (2024). Nigeria – Food production index. <https://www.indexmundi.com/facts/nigeria/food-production-index>
- IPCC. (2021). Climate change 2021: Impacts, adaptation and vulnerability. Intergovernmental Panel on Climate Change. <https://www.ipcc.ch>
- Keynes, J. M. (1936). The general theory of employment, interest and money. Macmillan.
- Kruglanski, A. W., & Fishman, S. (2006). The psychology of terrorism: “Syndrome” versus “tool” perspectives. *Terrorism and Political Violence*, 18(2), 193–215. <https://doi.org/10.1080/09546550600570119>
- Mekonnen, D. A., Trijsburg, L., Achterbosch, T., Brouwer, I. D., Kennedy, G., Linderhof, V., Ruben, R., & Talsma, E. F. (2021). Food consumption patterns, nutrient adequacy, and the food systems in Nigeria. *Agricultural and Food Economics*, 9(1), 16. <https://doi.org/10.1186/s40100-021-00188->
- Malthus, T. R. (1798). An essay on the principle of population. Cambridge University Press.
- National Bureau of Statistics. (2023). Agricultural sector performance report. NBS.
- National Bureau of Statistics. (2024). Report on agriculture. NBS.
- Nigeria metrological agency (NiMet)(2024), makurdi station, complied by IJRPR. Vol 5(12). <https://ijrpr.com/uploads/v5issue12/ijrpr36171.pdf>.
- Nnajieze, I. E. (2026). Effect of agricultural funding on food security in Nigeria. *European Journal of Agriculture and Forestry Research*, 14(1), 13–25. <https://doi.org/10.37745/ejaf.2013/vol14n11325>
- Edeh, C. E., Ogbodo, J. C., & Onyekwelu, U. L. (2020). Impact of government expenditure on agriculture on agricultural sector output in Nigeria (1981–2018). *International Journal of Research and Innovation in Social Science*, 4(10), 15–26.
- Ogundipe, A., & Ogunniyi, A. (2023). Agricultural growth and economic performance in Nigeria. *International Journal of Economics and Finance*, 15(3), 245–259.
- Okwuchukwu, O. (2022). Agricultural financing and agricultural sector output in a developing economy: The Nigerian experience. *Amity Journal of Management Research*, 5(1), 36–51.
- Osabohien, R., Onyinye, F., & Onyinye, E. (2018). An econometric analysis of food security and agricultural credit in Nigeria (1990–2016). *The Open Agriculture Journal*, 12(1), 227–239. Covenant University Repository
- Oshim, J. C., & Nnajieze, F. (2024). Government agricultural expenditure and Sustainable Development Goal 1 in Nigeria. *European Journal of Business and Innovation Research*, 12(7), 119–135.
- Osu, A. K. (2017). Population dynamics and food security in Nigeria. *International Journal of Advanced Studies in Economics and Public Sector Management*, 5(2), 129–139

Onyibe, O. C. (2026). Government Expenditure on Agriculture and Food Security in Nigeria.

- Pernechele, V., Fontes, F., Baborska, R., Nkuingoua, J., Pan, X., & Tuyishime, C. (2021). Public expenditure on food and agriculture in Sub-Saharan Africa: Trends, challenges and priorities. *Food Security*, 11(1), 16–29.
- Rueben, J., Nyam, C., & Rukwe, D. (2020). Agricultural Credit Guarantee Scheme Fund and its effect on agricultural output in Nigeria. *Review of Agricultural and Applied Economics*, 23(2), 102–111.
- United States Agency for International Development. (2020). World food programme overview. USAID.
- Yusufu, A. A. (2022). Agriculture financing and food security in Nigeria. *Journal of Economic and Allied Research (JEAR)*, 7(1), 227–241.
<https://jearecons.com/index.php/jearecons/article/view/191>
- Zakaree, S., Alexander, A. A., Omele, A. H., & Salihu, A. (2022). Impact of Agricultural Credit Guarantee Scheme Fund on crops and livestock production in Nigeria (1987–2020). *POLAC Management Review*, 2(2), 1–12.