

Impact of Agricultural Financing on Food Security in Nigeria (1986 – 2024)

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Abstract

Agricultural financing is essential for enhancing food security as it provides farmers with the resources to access quality inputs, adopt modern practices, and increase productivity. By easing financial constraints, it helps reduce food shortages, improve availability, and support stable supply. Strengthening access to finance in agriculture therefore remains a key pathway to achieving sustainable food security. Thus, this paper investigated the impact of agricultural financing on food security in Nigeria from 1986 – 2024. The paper used secondary data sourced from the Central Bank of Nigeria Statistical Bulletin in the analysis. The data were analyzed using ARDL-ECM models estimation techniques. The result revealed that there is a long-run relationship between agricultural financing and food security. The findings also revealed that agricultural credit guarantee scheme fund and government expenditure on agriculture had positive but insignificant impact on food security by 9.52 percent (t-stat. = 0.63, p-value = 0.53) and 0.09 percent (t-stat. = 0.70, p-value = 0.49) but the increase will be insignificant. On the other hand, commercial banks' loan had positive and significant influence on food security as suggested by 11.70 percentage (t-stat. = 5.29, p-value = 0.00). Based on these findings, this paper recommended that Federal Ministry of Agriculture and Rural Development (FMARD) should continue to encourage commercial banks to expand credit facilities to the agricultural sector with policies such as lower interest rates on agricultural loans, targeted credit schemes, and risk-sharing mechanisms should be reinforced to sustain and scale up this positive contribution. Also, Federal Ministry of Agriculture and Rural Development (FMARD) should review the allocation and implementation of agricultural budgets. Greater emphasis should be placed on productivity-enhancing investments such as irrigation facilities, rural infrastructure, mechanization, and extension services.

Background to the Study

Food security remains a major global priority across the world today. It refers to the availability, accessibility, and utilization of sufficient, safe, and nutritious food to meet the dietary needs of all individuals for an active and healthy life. Food Security remains a major concern across the world as one in nine people on earth is suffering from hunger (Osabuohien, 2016). It encompasses various dimensions, including food production, distribution, affordability, and sustainability.

The issue of food security is influenced by factors such as climate change, population growth, economic instability, conflicts, and agricultural policies. Despite advancements in agricultural technology and food distribution systems, many regions continue to experience food shortages, malnutrition, and hunger. Addressing food security requires a multi-faceted approach involving government policies, international cooperation, sustainable agricultural practices, and socio-economic interventions.

Agricultural financing is one of the key aspects of ensuring food security in Nigeria as it impacts the productivity, sustainability, and resilience of the agricultural sector. Iwayemi, (2019) acknowledged the fact that increased funding and favorable agricultural policies will boost food production in Nigeria. Access to agricultural financing enables farmers to invest in modern farming techniques, improved seeds, fertilizers, irrigation systems, and mechanized equipment, leading to increased productivity and food availability. Financial support also facilitates access to storage facilities and efficient supply chains, reducing post-harvest losses and ensuring food reaches consumers at affordable prices. Moreover, credit and insurance schemes help farmers mitigate risks associated with climate change, pests, and market fluctuations, thereby stabilizing food production.

Sustainable agricultural financing is the process and resource provision that helps promote and maintain the use of sustainable farming methods. This covers a range of financial tools, including investment vehicles, grants, loans, and insurance, that are intended to promote and ease the shift to sustainable agriculture. Sustainable agricultural financing catalyzes change by tackling the financial obstacles encountered by farmers, enabling the broader implementation of ecologically sustainable and socially responsible farming methods (Oyamendan *et al.*, 2024). With the decrease in global biodiversity, our capacity to discover new food sources is being restricted. Additionally, most evaluations fail to provide information on the whole range of food resources eaten worldwide. As a result, the need for science-based policymaking has become crucial.

Attainment of food security in any country is usually insurance against hunger, malnutrition, poverty and unemployment that slow down economic development. Generally, a country is food-secure when a majority of its population has access to food in sufficient quantity and quality consistent with decent existence at all times. It has been documented since the 1980s, that the achievement of food security requires paying attention to supply-side, which can be secured through agricultural production,

commercial imports or food aid and on the demand-side food has to be safe, nutritious, and appropriate to meet food preferences. Undoubtedly, there are immense potentials in Nigeria's agricultural sector, which if properly managed would unleash income growth for farmers, food and nutritional security, and employment opportunities as well as elevate the country to the ranks of leading players in global food markets (FMARD, 2016).

In recent years, there has been renewed interest in reviving the agricultural sector as a means of diversifying the economy and reducing dependency on oil revenues. The Central Bank of Nigeria (CBN) has introduced various monetary policies and intervention programs aimed at stimulating agricultural financing and enhancing food security. Enhanced agricultural productivity leads to increased food security, reducing the vulnerability of the population to food shortages and price fluctuations (Reuben *et al.*, 2020). These policies include interest rate adjustments, credit schemes, and other financial incentives designed to encourage banks to extend credit to the agricultural sector.

Although agriculture plays a major role in Nigeria's economy, the sector remains structurally weak characterised by low mechanisation, inadequate infrastructure, and significant post-harvest losses. It still depends largely on outdated small-scale farming methods, which are insufficient to meet the needs of a rapidly growing population. As a result, this has had significant adverse effects on the sector's traditional role in food security and its contributions to economic growth (Oyelade, 2019). Therefore, this paper investigated how agricultural financing impacted food security in Nigeria, while the specific objectives are to:

- i. Evaluate the impact of agricultural credit guarantee scheme fund on food security in Nigeria.
- ii. Examine the impact of commercial banks' loans on food security in Nigeria.
- iii. Determine how government expenditure on agriculture impacted food security in Nigeria.

Literature Review

Conceptual Review

Agricultural finance is the branch of agricultural economics that deals with the acquisition and utilization of capital in agriculture. Hence, it is concerned with the demand for and supply of funds for the sustainability of the agricultural sector. It is also the study of financial intermediaries who obtain loanable funds from financial markets and institutions and extend the same to both small-scale and commercial farmers for agricultural production. It has both micro and macro dimensions. Furthermore, it studies the economic and financial interfaces between agriculture and the economy, as well as the impact of economic policies on the performance of agriculture. Agricultural finance also involves the analysis of the financial and capital structure of agricultural firms. From this background, Fadeyi (2018) notes that agricultural finance is hinged on four cardinal points: fund source, fund accessibility, fund utilization and repayment plan. This is why agricultural finance is crucial to agricultural production as it facilitates the procurement of critical inputs and technology.

Food security remains unknown, and this is owing to the diverse ways scholars from different fields have explained the term. The term has equally been used in different contexts, which also influence its exact meaning. Food, for instance, has been explained by Simelane and Worth (2020) as a substance one eats and drinks to support life and body development, and of which water was argued not to be a part of food. Equitable distribution of resources and market access are prerequisites for food security. This can occur in families, among people, in communities, and whenever there are good options and chances to act and make decisions. Dietary habits have been changing in many countries, with a decrease in the consumption of cereals and other basic foods and an increase in the consumption of meat, dairy products, and processed foods. The production, processing, and marketing techniques for food are also evolving quickly, and there has been a significant increase in the number of raw materials and processed food traded internationally (Bello *et al.*, 2024). In terms of food availability, access, and nutritional well-being, the world population growth and urbanization are major concerns. This implies that more food, goods, services, and job opportunities will be needed to accommodate the growing population.

Agricultural Credit Guarantee Scheme Fund (ACGSF) refers to a government-backed financial program that offers credit guarantees to agricultural stakeholders, facilitating access to loans and investments in the agricultural sector (Reuben *et al.*, 2020). This program plays a vital role in promoting financial inclusivity and supporting the development of agricultural activities by providing credit guarantees to various stakeholders within the agricultural value chain (Sulaimon, 2021). In essence, the ACGSF serves as a strategic mechanism to mitigate the risks associated with agricultural lending, thereby facilitating increased access to credit for farmers, agribusinesses, and other entities involved in the agricultural domain. According to Ojo and Oluwaseun, (2015), one of the primary objectives of the Agricultural Credit Guarantee Scheme Fund is to address the historical challenges faced by agricultural stakeholders in securing loans from financial institutions. Given the inherent uncertainties and risks associated with agriculture, traditional lenders often hesitate to extend credit to this sector.

According to Mishkin and Eakins (2015), commercial bank loans refer to the financial activities through which commercial banks extend credit to individuals, businesses, and other entities for various purposes, including investments, consumption, and working capital needs. It is a fundamental function of commercial banks, enabling them to mobilize funds from depositors and allocate them to borrowers, thereby facilitating economic growth and development. Commercial banks evaluate the creditworthiness of potential borrowers by assessing their financial health, repayment capacity, collateral, and credit history. Once a borrower's creditworthiness is established, commercial banks initiate the loan origination process. This involves documenting the terms of the loan, including the principal amount, interest rate, repayment schedule, and any collateral requirements, in a loan agreement (Saunders & Cornett, 2017).

Government expenditure refers to the amount of money spent by a government on goods and services, such as education, healthcare, defense, infrastructure, and social welfare programs, among others, to support its citizens and fulfill its responsibilities it is also refers to as the spending of public funds by a government to finance its activities, programs, and services. It is also referring to the process by which governments allocate resources to achieve social goals (Joseph 2015). According to Organization for Economic Co-operation and Development (OECD) (2019), Government expenditure refers to the spending of public funds by government entities to provide goods and services to society.

Theoretical Review

Underpinning Theory

The theoretical underpinning for this paper is the production theory. Adam Smith (1776) formulated the theory. It states that for a production of goods or services (output) to occur there has to be a combination and utilization of the necessary factors of production (inputs). In relation to food production (food security) and agricultural financing in Nigeria, there is urgent need for the efficient and effective combination and utilization of the necessary agricultural production inputs (financing and human resources) couple with the adaptation of the modern agricultural technology to improve food production and utilization. The value of those resources signifies the amount of the agricultural financing required for the quantity of the agricultural output (food production) to be attained.

The production theory was adopted due to its emphasis on the assumption that increase in production in a form of output can be enhance by improving the quantity and quantity of the factors of production such as Land, Labour, Capital and entrepreneur. In other words, increase in food production is derived by the corresponding increase in the quantity and quality of farmland, labour in a form of employment, capital in a form of adequate financial service provisions such as agricultural credits, agricultural savings and agricultural insurance. Jhingan (2012) presented the model as;

$$Q = f(L, N, C, M, T)$$

Where Q signifies the output of a product per unit time, L stands for labour, N stands for Land, C stands for Capital, M stands for management of entrepreneurship, and T stands for a given Technology required to poster the production of goods and services.

In relation to this study, the agricultural finance entails the acquisition and utilization of capital in a form of agricultural savings, agricultural credits and agricultural insurance as well as other factors of production. In addition, the theory contributed in introducing technology as an important production input which form part of the important production inputs necessary for efficient and effective agricultural production. The combination of the available production inputs forms the basis for improved and efficient facilitations of agricultural activities towards generating sustainable food production

outputs, which can be achieved through proper management of the available production inputs.

The theory further explained that for the agricultural production to take place there is need for additional inputs apart from capital (agricultural finance). Based on that, land is very fundamental, labour is another important production input, technology also contributes in significant ways to efficient and effective production. Although, agricultural financing may be used to acquire most of the production inputs which are materialistic. More so, the theory also contributes in unveiling another important agricultural production input which in a form of entrepreneur which can be term as the agricultural or farm manager.

Empirical Review

Awujola *et al.*, (2024) examine the impact of agricultural credit guarantee scheme fund on agricultural sector output in Nigeria spanning 1999-2021. Autoregressive Distributed Lag (ARDL) regression as technique of estimation. The results of the descriptive statistic revealed that ACCP had more effect on ASO than ACLP and ACFP. Furthermore, the findings revealed that agricultural credit guarantee scheme fund to crop, livestock and fishery production respective had $p < 0.05$ signifying that each had significant positive effect on agricultural output in Nigeria. The study concluded that agricultural credit guarantee scheme fund has effect on agricultural sector output in Nigeria and recommended among others that the Federal Government should increase its funding of agricultural credit guarantee scheme fund in its annual budget and access to the funds by farmers and ensure more component of livestock farming are incorporated in the disbursement of agricultural credit guarantee scheme fund so as enhance agricultural output in Nigeria.

Chamba and Tarirai (2024) investigated the effectiveness of agricultural financing in enhancing agricultural production in Zimbabwe. The study used the Autoregressive Distributed Lag (ARDL) for analysis. The findings indicate a robust positive correlation between agricultural loans and agricultural output. Increased access to financing enables farmers to invest in inputs, machinery, and technology, leading to significant boosts in productivity. While FDI has the potential to introduce advanced technologies and capital, the findings suggest a non-significant direct impact on production. However, it may indirectly contribute through improved infrastructure and market access. Additionally, the research confirms a significant positive link between domestic agricultural capital and agricultural production. Sufficient availability of capital, for land improvement, irrigation, and modern techniques, is strongly linked to increased production.

Usman *et al.*, (2024) analyzed the impact of agricultural financing on agricultural output in Nigeria from 1991 to 2022. Employing an Autoregressive Distributed Lag (ARDL) model, the findings indicate that both government capital expenditure and ACGS positively and significantly influence agricultural output in both the short and long run.

Commercial bank credit schemes also have a positive and significant impact, although some studies report this effect as positive but not statistically significant. The study highlights the crucial role of financial support in boosting agricultural productivity and offers policy recommendations to improve agricultural financing mechanisms. These include increasing government investment, enhancing credit schemes, and strengthening the ACGS to ensure sustainable agricultural growth and economic development in Nigeria.

Oyamendan *et al.*, (2024) examined the contribution of agricultural financing to food security in Nigeria from 1981 to 2022. It utilized the autoregressive distributed Lag (ARDL) model as the main estimation technique and found that government expenditure on agriculture and agricultural sector guarantee credit scheme loans to the agricultural sector had a negative influence on food security in Nigeria, while deposit money banks (DMBs) credit to agriculture is found to influence food security in Nigeria detrimentally. The study recommended that government expenditure on agriculture should be channeled towards the rural region of the country, and credit for agricultural purposes should be given to the peasant farmers who engage in small-scale farming in Nigeria.

Ajamunigbohun and Abdul-Azeez (2023) examined the impact of Agricultural Insurance on Food Supply Systems in Nigeria. Survey research design was adopted in the cause of the research undertaking. The monthly primary data were collected from the A sample of 800 National Agricultural Insurance Cooperation (NAIC) registered farmers in Nigeria. Crop Agricultural Insurance, livestock Agricultural Insurance and Fishery Agricultural Insurance were used to measure agricultural insurance in Nigeria. While, food production index was used to measure the food production in Nigeria. The result of the analysis indicated that the level of agricultural insurance is low and the level of food production supply is low in Nigeria.

Dimgba *et al.*, (2023) examined the effect of agriculture financing for output growth: a focus on livestock production in Nigeria from 1981 to 2021. Error Correction Model (ECM) was used for analysis the parsimonious ECM shows that the agriculture credit guarantee scheme fund has a positive and significant effect on livestock output. The results further show that bank loans and advances, as well as foreign aid to agriculture, negatively and significantly affected livestock production. Given the findings, this study recommends that policymakers ensure that agriculture financing prioritizes poultry production by allowing for adequate provisions of agriculture credit guarantee scheme funds to poultry farmers.

Eno and Eze (2023) assessed the relationship between Agricultural Financing and Agricultural Output in Nigeria using data sourced from secondary sources for the period 2011–2021. Ordinary Least Square (OLS) regression method and Error Correction Modelling were employed to examine the impact and level of relationship between the dependent variable and each of the independent variables. The analysis showed that agricultural financing positively contributed to the economic performance of Nigeria.

Okwuchukwu (2022) investigated the effect of agricultural sector funding on the productivity of the agricultural sector in Nigeria using time series data from 1981 to 2018. Vector Error Correction Mechanism (VECM) was used to examine the speed of adjustment from short-run dynamics to long-run equilibrium. The results showed that ACGS had a positive and significant long-run effect on AGDP, while CBCA, GEXA, and INTR had negative but significant effects on AGDP within the reference period.

Eyo *et al.*, (2020) investigated the impact of the Agricultural Credit Guarantee Scheme Fund (ACGSF) on agricultural output in Nigeria using the Ordinary Least Squares (OLS) technique. Their findings indicated a significant positive effect of the ACGSF on agricultural output, supporting the notion that access to guaranteed credit enhances agricultural productivity. In contrast, Okafor (2020) explored the impact of commercial bank credit and ACGSF on agricultural development using the Augmented Dickey Fuller test, Phillip-Perron test, and OLS technique. Okafor's results revealed that neither commercial bank credit to agriculture nor the ACGSF had significant effects on agricultural output, suggesting that other factors might influence agricultural development beyond the availability of credit.

Osabohien *et al.*, (2018) investigated the potential of credit extended to agricultural sector (proxied by bank credit to agriculture and ACGSF) on food security in Nigeria employing annual data from 1990 to 2016 and employed the ARDL model. The study found that credit extended by the commercial banks and the ACGSF exhibits a positive and significant relationship with food security. Specifically, bank credit and ACGSF resulted in rise in food security by 8.12 percent and 0.002 percent respectively, whereas population growth decreases food security by 0.001 percent.

Udoka *et al.*, (2016) examined the effect of commercial banks' credit on agricultural output in Nigeria, covering the period from 1970 to 2014. Using OLS technique to estimate the relationships between explanatory variables and agricultural production. Their findings also showed a positive and significant relationship between commercial banks' credit to the agricultural sector and agricultural production in Nigeria. Both studies highlight the crucial role of commercial bank credit in boosting agricultural output, demonstrating that access to credit is a key driver of agricultural productivity in the country.

Ewubare and Eyitope (2015) examined the effects of government spending on the agricultural sector in Nigeria. The Ordinary Least Square (OLS) was used for analysis. They implied that government expenditure has positive impact on agricultural sector in Nigeria. Based on the above findings, they recommended for an increase funding of the agricultural sector in Nigeria. The fact that agriculture public spending may be an outcome rather than the cause of agricultural productivity was not tested in the study and that may bias their estimate upward or backward.

Methodology

In this paper, the selected research design is the *ex-post facto* design. The *ex-post facto* design is particularly suited for studies aiming to decipher statistical associations

between dependent and independent variables, primarily to establish cause-and-effect relationships.

The Autoregressive Distributed Lag Model (ARDL) was used in this study to examine the long-term and short-term effects. A modified model developed by Oyamendan *et al.* (2024) titled Agricultural Financing and Food Security in Nigeria serves as the foundation for the model adapted for this study. It was stated that his was:

$$FPI = f(GEA, DCA, AGS, INT, AGO) \dots\dots\dots 1$$

Where: FPI is the food production index, GEA is government expenditure on agriculture, AGS is the agricultural sector guarantee scheme fund loan to the agricultural sector, INT is the interest rate, and AGO is the agrarian output.

This model failed to add relevant control variables of commercial banks' lending. This limits the pass-through effect of agricultural financing on food security. Hence, this study improves on its model by modifying it. Thus, the modified functional relationship version of this study is:

$$FPI = f(ACGSF, CBL, EXPA) \dots\dots\dots 2$$

Explicit, equation 2 can be written as:

$$FPI = \beta_0 + \beta_1 ACGSF + \beta_2 CBL + \beta_3 EXPA + \epsilon_t \dots\dots\dots 3$$

Where;

- FPI = Food production index as proxy of food security
- ACGSF = Agricultural Credit Guarantee Scheme Fund
- CML = Commercial Banks' Loans
- EXPA = Government Expenditure on Agricultural
- ε = Error Term
- t = Time Period (Annually)
- b₀ = Intercept term
- b₁ – b₃ = Parameters of the Variables respectfully
- ε = Error term

A Priori Expectation

It was expected that based on a priori relationship between the dependent and independent variables, β₁, β₂, β₃ > 0. Meaning the relationship between agricultural credit guarantee scheme fund, commercial banks' loans and government expenditure on agricultural on food security are expected to be positive.

Autoregressive Distributed Lag (ARDL)

The ARDL co-integration Test carried out. The Autoregressive Distributed Lagged (ARDL) Bounds test was used to examine the co-integration between agricultural

financing and food security in Nigeria. It enables the researcher to utilize variables that are not integrated in the same order. The following were the specifications for the Autoregressive Distributed Lagged (ARDL) model as:

$$\ln FPI_t = \beta_0 + \sum_{i=1}^p \beta_1 \Delta \ln FPI_{t-i} + \sum_{i=1}^p \beta_2 \Delta \ln ACGSF_{t-i} + \sum_{i=1}^p \beta_3 \Delta \ln CBL_{t-i} + \sum_{i=1}^p \beta_4 \Delta \ln EXPA_{t-i} + \alpha_5 \ln FPI_{t-1} + \alpha_6 \ln ACGSF_{t-1} + \alpha_7 \ln EXPA_{t-1} + e_t \dots \dots \dots 4$$

Where;

- Δ = First difference
- β_0 = constant parameter
- $\beta_1 - \beta_4$ = coefficient of the short run parameter
- $\alpha_5 - \alpha_7$ = coefficient of the long run parameter

Results and Discussions

Descriptive Statistics Results

Descriptive statistics offers a preliminary understanding of the distribution, central tendencies, variability of the variables used in this paper. It helped to summarize the key characteristics of the dataset and provide insight into patterns and behavior of the variables.

Table 1: Descriptive Statistics

	FPI	ACGSF	LCBL	GEXPA
Mean	76.17103	33929.36	4.378816	28.47744
Maximum	124.5700	72322.00	7.990716	92.91000
Minimum	29.24000	5203.000	0.604316	0.020000
Std. Dev	27.70432	16536.80	2.051220	29.34743
Skewness	0.107262	0.508013	-0.096408	0.730187
Kurtosis	2.009634	2.426906	2.075769	2.244186
Jarque-Bera	1.668624	2.211212	1.448495	4.393914
Probability	0.434173	0.331010	0.484698	0.11141
Observations	39	39	39	39

Source: Authors Computation, (Eviews-12), 2025

The descriptive statistics for food security proxied by food production index (FPI) revealed the mean value of 76.17% indicating on average, food security contribution to the Nigerian economy over the study period. The maximum and minimum values were found to be 124.57% and 29.24% respectively indicating a significant variation in the performance of food security proxied by food production index. The standard deviation was found to have 27.70% indicating a minimal volatility in food security. The positive skewed 0.11 indicates that the distribution of food security is rightly skewed. The kurtosis value is 2.01 implies a platykurtic (flat and short tailed) distribution. The Jarque-Bera statistics value was 1.67 and probability value 0.43 implies that the data are approximately normally distribution at 5%.

Agricultural credit guarantee scheme fund has the mean value of 33929.36, maximum value of 72322.00 and the minimum value of 5203.00, revealing the contribution of agricultural credit guarantee scheme fund to the economy for the period of study. The standard deviation has the value of 16536.80 this revealed volatility in Agricultural credit guarantee scheme fund. The negative skewness 0.51 indicates that the distribution of agricultural credit guarantee scheme fund is left-skewed while the kurtosis value of 2.43 implies a platykurtic (flat and short tailed) distribution. The Jarque-Bera statistics value was 2.21 and probability value 0.3310 implies that the data are approximately normally distribution at 5%.

Similarly, the mean value of commercial banks' loans was 4.38 indicating the average contribution of commercial banks' loans to the agricultural sector over the study period. The maximum and minimum values of commercial banks' loans were 7.99 and 0.60 respectively, indicating a significant variation in commercial banks' loans over time. The standard deviation was found to have 2.05 indicating a minimal volatility. The negative skewed -0.10 indicates that the distribution of commercial banks' loans is left skewed. The kurtosis value is 2.08 implies a platykurtic (flat and short tailed) distribution. The Jarque-Bera statistics value was 1.45 and probability value 0.48 implies that the data are approximately normally distribution at 5%.

Lastly, the mean value of government expenditure on agricultural was found to be 28.48 showing the average contribution to the economy for the period of study. The maximum value of 92.91 and the minimum value of 0.02, which implies the significant variation in the government expenditure on agricultural over time. The standard deviation revealed the value of 29.35 indicating a minimal volatility. The negative skewed 0.73 indicates that the distribution of government expenditure on agricultural is left skewed. The kurtosis value is 2.24 implies a platykurtic (flat and short tailed) distribution. The Jarque-Bera statistics value was 4.39 and probability value 0.11 implies that the data are approximately normally distribution at 5%.

Unit Root Test

Unit root testing is a crucial step in time series analysis as it helps to determine the stationery of the data set. When variables are non-stationery, regression models produce a spurious result. To avoid such issues, the Augmented Dickey-Fuller (ADF) test was employed in this paper to examine the order of integration for each of the variables used.

Table 2: Unit Root Test Results

Variables	ADF Test Statistics	Critical ADF Test	Order of Integration
FPI	-2.968215	-2.945842**	I (1)
ACGSF	-4.740185	-2.943427**	I (1)
LCBL	-7.007961	-2.943427**	I (1)
GEXPA	-6.832006	-2.945842**	I (1)

Note: *** significant at 5%

Source: Authors Computation, (Eviews-12), 2025

The results in table 2 revealed that food security proxied by food production index, agricultural credit guarantee scheme fund, commercial banks' loans, government expenditure on agricultural were not found to be stationary at level, as their ADF statistic values are lesser than their critical value with their probabilities greater than 5% level of significance. However, they became stationary at first difference as their ADF test statistics were more negative than the critical value and their p-values which were less than 5% significant of level. This implies that food security proxied by food production index, agricultural credit guarantee scheme fund, commercial banks' loans, government expenditure on agricultural were integrated at order one [I (1)].

Table 3: The Result of Bound Test - Co-integration Analysis

Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.006564	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Authors Computation, (Eviews-12), 2025

From the co-integration test captured in table 3, it could be seen that F-statistic value of 4.006564 is greater than the lower bound [I (0)] and upper bound [I (1)] critical values of 2.79 and 3.67 respectively at 5% level of significant. This indicates that the variables were found to be co-integrated, and as such, there is a long-run equilibrium relationship between agricultural financing and food security in Nigeria for the period under review.

Table 4. ARDL Model Results of the Short-Run, Long-Run ECM

Dependent Variable: NMS

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FPI(-1))	-0.019367	0.099183	-0.195261	0.8466
D(FPI(-2))	0.623199	0.099689	6.251430	0.0000
D(LCBL)	-3.489316	1.483041	-2.784835	0.0259
CointEq(-1)*	-0.237316	0.049598	-4.784835	0.0000
R-squared	0.683271			
Adjusted R-squared	0.653578			
Durbin-Watson stat	1.877278			
LONG RUN				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCEC	0.265972	0.054331	4.895424	0.0000
LPEC	0.100763	0.353209	0.285278	0.7776
LLNG	0.527417	0.264846	1.991408	0.0566

Source: Authors Computation, (Eviews-12), 2025

The table 4 revealed the results of the Auto-Regressive Distributed Lag (ARDL) model, focusing on both the short-run and the long-run relationship between the dependent variable food security proxied by food production index and independent variables: agricultural credit guarantee scheme fund, commercial banks' loans, government expenditure on agricultural and Error Correction Model.

The of error correction term $CointEq(-1)$ in the ARDL model captures the speed at which short run deviations from the long run equilibrium are corrected. Error correction term has the coefficient value of -0.2373 which is significant with the t-statistics value of -4.784835 and p-value of 0.0000 , this implies a strong statistical significance at 5% level. The negative sign of ECM revealed the existence of long run relationship among the variables and shows how the system will adjust back to equilibrium aftershocks. The coefficient of ECM been -0.2373 implies the average speed of 23.73% to correct any deviation in the long run.

The long run results, the coefficient of agricultural credit guarantee scheme fund was found to be positive (9.52) but statistically insignificant on at 5% level, with the t-statistics of 0.630080 and a p-value of 0.5338 . This implies that agricultural credit guarantee scheme fund is associate with positive influence on food security in the long run. Similarly, commercial banks' loans have a coefficient of 11.69852 with its associate p-value of 0.0000 which is significant at 5% level. Additionally. government expenditure on agricultural also has the coefficient value of 0.092390 with a t-statistics of 0.702171 and a p-value of 0.4884 which is insignificant at 5% level in the long run. This result indicates that agricultural finance has a positive impact on food security in the long run.

Discussion of Findings

The findings of this paper revealed that agricultural credit guarantee scheme fund has a positive but statistically insignificant impact on food security in Nigeria. The positive coefficient implies that a unit increase in agricultural credit guarantee scheme fund will lead to 9.52 in increase in food security in Nigeria in the long run. This outcome is consistent with the a priori expectation of the model of this paper. This finding is in line with other findings like Okidim *et al.* (2023) who studied the effect of agricultural funding on agricultural growth in Nigeria, there findings revealed that agricultural credit guaranteed scheme fund influences agricultural output in Nigeria within the period of 1990-2020. Their study also revealed that ACGSF disbursement directly to farmers contributes positively on agriculture output. Similarly, in the study of Tijjani *et al.* (2022) who evaluated the influence of different forms of agricultural funding on food security in Nigeria, found that agricultural credit guarantee scheme funds had a positive influence on food security they also added that boosting access to food security, efforts should be made to raise the per capita income of the people in other to fulfill the demand for food in Nigeria.

On the other hand, commercial banks' loans were revealed to have a positive and significant impact on food security in Nigeria, this shows that an improvement in

commercial banks' loans will contribute significantly to food production thereby achieving food security in Nigeria. The outcome of this paper highlights the importance of commercial banks' loans to farmers as a means of boosting food security in Nigeria. This result concurred with a priori expectation of this paper. This outcome is similar to the study of Oyamendan *et al.* (2024) who examined the contribution of agricultural financing to food security in Nigeria, their result revealed that deposit money banks (DMBs) credit to agriculture had a positive influence on food security in Nigeria. Also, Usman *et al.* (2024) analyzed the impact of agricultural financing on agricultural output in Nigeria. Their study shows that commercial bank credit schemes had a positive and significant impact on agricultural output in Nigeria. The findings of Okafor (2020) who revealed that commercial bank credit had positive effect on agricultural output in Nigeria and can increase agricultural production in Nigeria.

In contrast, the paper also found that government expenditure on agricultural also had a positive but significant impact on food security in Nigeria for the period under review. This result revealed that impact of government expenditure on agricultural direct impact on food security but the impact is insignificant. This outcome is in line with other studies like, Usman *et al.* (2024) who studied the impact of agricultural financing on agricultural output in Nigeria. Their result revealed that government capital expenditure and ACGS positively and significantly influence agricultural output in Nigeria. The also highlights the crucial role of financial support in boosting agricultural productivity and call for an improvement in agricultural financing mechanisms.

Conclusion and Recommendations

In conclusion, the paper revealed that agricultural financing has a significant impact on food security in Nigeria for the period under review, though their impacts may differ by mode. Agricultural credit guarantee scheme fund has a positive but statistically insignificant impact on food security in Nigeria in the long run, calling for improvement in other to fight food insecurity. Similarly, commercial banks' loans also found to have positive and significant impact on food security in Nigeria, revealing the importance of loans in assisting the farmers to improve output. Furthermore, government expenditure on agricultural had a positive but significant impact on food security in the long run.

Based on the findings of this paper, it is therefore recommended that:

- i. Central Bank of Nigeria (CBN), in partnership with the Federal Ministry of Agriculture and Rural Development (FMARD) should strengthen the operational framework of the scheme by including timely disbursement of funds, expansion of credit access to local farmers, and reduction of bureaucratic hurdles. Furthermore, complementary interventions such as improved extension services, rural infrastructure, and market linkages should be pursued to ensure that agricultural credit translates into meaningful and sustainable improvements in national food security.
- ii. Central Bank of Nigeria (CBN), in collaboration with the Federal Ministry of Agriculture and Rural Development (FMARD) should continue to encourage

commercial banks to expand credit facilities to the agricultural sector. Policies such as lower interest rates on agricultural loans, targeted credit schemes, and risk-sharing mechanisms should be reinforced to sustain and scale up this positive contribution. In addition, they should also strengthen the monitoring systems to ensure effective utilization of loans and providing technical support to beneficiaries which will further maximize the impact of commercial banks' credit on improving food security across the country.

- iii. Federal Government of Nigeria, through the Federal Ministry of Agriculture and Rural Development (FMARD) and the Federal Ministry of Finance, Budget and National Planning should review the allocation and implementation of agricultural budgets, and greater emphasis should be placed on productivity-enhancing investments such as irrigation facilities, rural infrastructure, mechanization, and extension services. Equally to ensure transparency and accountability in the disbursement of funds to reduce leakages and inefficiencies. By aligning agricultural expenditure with strategic priorities and monitoring outcomes, government spending can more effectively translate into significant and sustainable gains in national food security.

Reference

- Ajamunigbohun, S. S., & Abdul - Azeez, I. F. (2023). Agricultural insurance and sustainable food supply: An assessment for Nigerian farmers, *A Journal of Agricultural Economics and Development* 32 (2), P119 - 130.
- Awujola, A., Ezie, O., & Kuzhe, D. M., (2024). Impact of agricultural credit guarantee scheme fund on agricultural output in Nigeria, *International Journal of Humanities Social Science and Management (IJHSSM)*. 4(1), pp: 436-447
- Bello, M, M., Yahaya, U, J., & Adamu, I., (2024). An analysis of sustainable agricultural productivity and food security in Nigeria. *Journal of Political Discourse*. ISSN Print: 2992-2763 - ISSN Online: 2992-4618 | 2, 1,(2)
- Chamba, L., & Tarirai, I. (2024). The efficacy of agricultural financing on agricultural production in Zimbabwe, *African Journal of Commercial Studies*, 5(4), 273-288.
- Dimgba, E., Rachael Morris, R., & Okuduwor, A. A., (2023). Agriculture financing for output growth: A focus on livestock production in Nigeria. *IIARD International Journal of Economics and Business Management*. E-ISSN 2489-0065 P-ISSN 2695-186X9. (7)
- Eno, E. J. & Eze, F. O. (2023). Relationship between agricultural financing and agricultural output in Nigeria. *Global Journal of Finance and Business Review* | ISSN, 1694, 450X.

- Ewubare, D. B. & Eyitope, J. A. (2015). The effects of public expenditure on agricultural production output in Nigeria. *Journal of Research in Humanities and Social Science*, 11(3), 07-23.
- Eyo, E. O., Nwaogu, M. A., & Agenson, M. E. (2020). Agricultural credit guarantee in Nigeria and the uncertainties of the macroeconomic environment. *International Journal of Economics and Financial Issues*, 10(20), 20 - 29.
- Fadeyi, O. A. (2018). Smallholder agricultural finance in Nigeria: The research gap, *Journal of Development and Agricultural Economics*, 10(11), 367-376.
- Ojo, O., & Oluwaseun, Y. (2015). Agricultural financing and economic development in Nigeria: A study of agricultural credit guarantee scheme fund (ACGSF). *Development*, 10, 11.
- Okafor, C. A. (2020). Commercial banks credit and agricultural development in Nigeria, *International Journal of Business & Law Research*, 8(3), 89-99.
- Okidim, I. A., Odukwo, C. C., & Chukuigwe, E. C., (2023). Effect of agricultural funding on agricultural output in Nigeria (1990-2020). *International Journal of Social Sciences and Management Research* E-ISSN 2545-5303 P-ISSN 2695-2203 9(3)
- 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, O. Gershon, O. Matthew, E. Osuagwu, U. E. Ekhaton-Mobayode, U, & Osabuohien, E. (2020a). Household access to agricultural credit and agricultural production in Nigeria: A propensity scores matching model, *South African Journal of Economic and Management Sciences*, 23(1), 1-11.
- Osabuohien E., (2016). Economy without buffer must experience shocks. *Daily Times*. Monday June 20; B8.
- Oyamendan, A. E., Akinradewo, T. R., Olanipon, O. O., & Abere, M. A. (2024). Agricultural financing and food security in Nigeria: A strategy for achieving sustainable development goals (SDGs). *Jalingo Journal of Social and Management Sciences*, 6(1), 1-16.
- Oyelade, A. O. (2019). Impact of commercial bank credit on agricultural output in Nigeria. Review of innovation and competitiveness: *A Journal of Economic and Social Research*, 5(1), 5-20.

- Reuben, J., Nyam, C. M., & Rukwe, D. T. (2020). Agricultural credit guarantee scheme fund and its effect on agricultural output in Nigeria, *Review of Agricultural and Applied Economics (RAAE)*, 23(1340-2021-020), 102-111
- Simelane, K. S., & Worth, S. (2020). Food and nutrition security theory. *Food and Nutrition Bulletin*, 41(3), 367-379.
- Sulaimon, M. (2021). *Agricultural credit guarantee scheme fund (ACGSF) and agricultural performance in Nigeria: A threshold regression analysis*, Available at https://mpr.ub.uni-muenchen.de/105564/1/MPRA_paper_105564.pdf
- Tijjani, B. & Anthony, B. O. (2022). Financing agricultural sector, a panacea for food security in Nigeria, *Journal of Economics, Management and Trade*, 28(11). 45-55. ISSN 2456-9216. <https://doi.org/10.9734/jemt/2022/v28i111054>
- Udoka, C. O., Mbat, D. O. & Duke, S. B. (2016). The effect of commercial banks' credit on agricultural production in Nigeria. *Journal of Finance and Accounting*, 2016, 4(1), 1-10. DOI:10.12691/jfa-4-1-1
- Usman, J., Singh, P. K., & Singh, O. P. (2017). The impact of agricultural credit guarantee scheme fund (ACGSF) to agricultural produce in Nigeria. *Indian Journal of Economics and Development*, 13(2a), 605-610.