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Agriculture and Economic Growth: A Nigerian Perspective

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ABSTRACT

In Nigeria, there has been a longstanding concern over the need to improve and sustain productivity in the agricultural sector. To remain competitive in the global market, Nigeria must focus on producing goods and services through the agricultural sector. Therefore, a sustained increase in production in this sector is paramount for the country's survival and ability to compete with other nations. This study investigates the state of Nigeria's agricultural sector and its influence on the country's economic growth from 1989 to 2021. The research utilized secondary data, obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank indicators. The study's objectives were to assess the effect of agricultural production on Nigeria's economic growth and to determine whether private sector credit to agriculture contributes to that growth. The t-statistics indicate that real GDP, the growth rate of agricultural output, private sector credit to agriculture, inflation, and government spending all significantly impact economic growth at a 5% critical value. However, gross capital formation was found to have no significant effect at the same critical value. The study recommends that the government should focus on fostering a supportive environment to direct more credit to the agricultural sector in Nigeria. This can be achieved through monetary policies made by the central bank such as giving special directives to the commercial banks to issue loans and other credit facilities to players in the agricultural sector.

INTRODUCTION

The agricultural sector is a crucial component of any economy and its sustainable productivity has significant impacts on macroeconomic goals (Ibe *et al.*, 2019). In Nigeria, there has been a longstanding concern over the need to improve and sustain productivity in the agricultural sector. The sector encompasses the production of crops, the rearing of animals, fishery, forestry, and other related activities. Nigeria must focus on producing goods and services through the agricultural sector to remain competitive in the global market. Therefore, a sustained increase in production in this sector is essential for the country's survival and ability to compete with other nations. Godwin (2018) defines economic growth as the rise in real gross domestic product (GDP), which is GDP adjusted for inflation.

Ewubare and Obayori (2015) emphasized the importance of consistent and sustained macroeconomic policies in the agricultural sector, as it has the potential to connect with the industrial sector and possesses a high-value chain that can drive further production. An increase in agricultural output, combined with other factors and a favorable policy environment, can contribute to economic growth. In light of the challenging economic conditions in many developing countries, which result in poverty and unstable macroeconomic variables, improving agricultural productivity is crucial.

Economic growth is crucial to economic development, as it helps improve the living standards of citizens in

developing countries like Nigeria. A stagnant economy leads to higher unemployment rates and increased social hardship (Ekundayo, 2014). In 1990, Nigeria's GDP growth rate was 3.2%, with the agricultural sector contributing 320 million naira. However, during the international sanctions on the Abacha regime in 1995 and 1996, GDP growth dropped to 1.2% and 0.8%, respectively, with agriculture's contribution falling to 225 million and 230 million naira (Adesina, 2017). From 2000 to 2005, GDP growth averaged 4.5%, while agriculture's contribution to GDP increased by an average of 226%. The 2016 and 2020 recessions caused a decline in GDP growth due to reduced government investment in infrastructure and a lack of focus on agricultural productivity in Nigeria.

Agricultural production plays a crucial role in driving economic growth. Enhanced agricultural productivity increases farm incomes, expands the food supply, reduces food prices, and generates more employment opportunities in both rural and urban regions, thereby contributing to the growth of real GDP. Agricultural production involves cultivating plants or raising animals to produce goods that sustain or enhance human life. It is also a measure of the efficiency with which inputs are used to generate output in the agricultural sector (Opeyemi, 2018). Agriculture plays a crucial role in changing an economy's social and economic systems.

Agricultural production is critical for expanding employment opportunities, reducing poverty, increasing

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income, accelerating industrialization, and alleviating pressure on the balance of payments (Nwankwu, 2015). It has been a significant source of employment, supporting the nation's ability to feed its growing population, providing foreign exchange earnings, supplying local industries with raw materials, and serving as a dependable source of government revenue. This context highlights the importance of this study, which aims to examine the contribution of agricultural production to Nigeria's economic growth.

Statement of the Problem

Over the years, successive Nigerian governments have acknowledged the crucial role of agricultural production in achieving meaningful and sustainable growth in a developing economy but over the last three decades, the contribution of agriculture to GDP has continued to fall as economic growth has been decreasing in Nigeria. Agriculture's contribution to GDP has been maintaining a downward trend for example Nigeria's percentage contribution of agriculture to GDP decreased from 8.57 percent in 1990 to 4.56 percent in 2020 on average while economic growth in Nigeria also fell from 2.4 in 1990 to 0.4 in 2020 Nigeria as results of relatively low investment in agriculture productivity but more on oil sector of the economy in Nigeria by the federal government of Nigeria (CBN, 2021).

The objectives are:

- I. To examine the impact of agriculture production on economic growth in Nigeria.
- II. To examine the impact of private sector credit to agriculture on economic growth

LITERATURE REVIEW

Empirical Literature Review

Adewale (2011) examined the impact of agricultural production on the economic growth of Nigeria, using the OLS technique and time series data from 1986 to 2010. He concluded that low agricultural output leads to low investment, which negatively impacts economic development. The study therefore suggested that government should invest more in agriculture and other non-oil sectors to boost economic growth. Similarly, Udechukwu (2012) studied the impact of agricultural productivity on the socio-economic development of Nigeria between 1970 and 2011 using the OLS method. It was discovered that despite the high economic prospects in Nigeria, agriculture played a major role in its economic development.

Adenike (2013) estimated the relationship between agricultural production and per capita income in Nigeria between 1976 and 2018 using a 2SLS approach within a simultaneous equation model. The study found a negative relationship between GDP per capita and agricultural productivity, which was partly explained by the insufficient level of investments in agriculture. Isola (2014) applied the Johansen co-integration test, Granger causality analysis, and OLS using 20 years of data. It

was concluded that no significant relationship existed between agricultural production and economic growth determinants.

Yusuf (2015) analyzed the impact of government agricultural expenditure on the development of Nigeria using the Vector Autoregressive (VAR) model, with data ranging from 1960 to 2013. The results showed that government agricultural expenditure significantly affects economic development. In the same vein, Adeyemi (2016) analyzed the contribution of the agricultural sector to the economic performance of Nigeria using OLS with data from 1964 to 2013 and found that agriculture significantly contributes to economic performance.

Dike (2017) thus examined the relationship between agricultural productivity and the economy of Nigeria between 1989 and 2016 using OLS regression. The study established that there was a significant relationship between agricultural productivity and economic performance. Nwadike (2018), on his part, used the Auto Regressive Distributed Lag (ARDL) model in analyzing the relationship in Nigeria from 1981 to 2017 and found a positive but statistically insignificant effect on real GDP. Okeke (2019), through the FMOLS estimation method, analyzed the relationship of economic growth to agriculture within a period of 1995-2017. The results showed that the agricultural growth rate was statistically significant and positively related to real GDP. Also, Solomon and Eka (2020) carried out research on the contribution of agricultural production to the growth of the economy between 1981 and 2019 using OLS and observed the positive but insignificant effect of agricultural production on the growth of the economy.

Oyakhilomen and Zibab (2014), studied the relationship between agricultural productivity and economic performance in Nigeria with focus on poverty reduction. Time series data were employed in this research and the analyses of the data were done using unit root tests and bounds (ARDL) testing approach for cointegration. The study found that the agricultural sector's GDP contribution positively impacted economic growth, although farmer access to credit and government expenditure on agriculture had no significant impact. The Pearson correlation results of the data analysis indicated that agricultural production was significant in influencing the favorable trend of economic growth in Nigeria. Despite the growth of the Nigerian economy, poverty is still on the increase and this calls for monolithic oil-based economy to a more plural one with agriculture being the lead sector. The study recommended that pro-poor policies should be designed for alleviating rural poverty through increased investments in agricultural development by the public and private sector.

Ehui and Tsigas (2009) examined the role of agriculture in Nigeria's economic growth using a General Equilibrium Analysis with simulations based on a global trade model. The study concluded that agricultural investment could be as profitable as other sectors in Nigeria, with sub-sectors

like cattle, fruits, and vegetables outperforming oil and manufacturing. It emphasized that investing in agriculture has strong potential for job creation, food security, and foreign exchange earnings, and advocated for more investment in the sector.

Contribution To Knowledge

Most studies on the impact of agricultural production on economic growth in Nigeria have overlooked the role of private sector credit to agriculture, which enables many farmers to adapt and enhance their productivity in response to ongoing changes. This study will incorporate the development of private sector credit to agriculture and its role in facilitating the contribution of agricultural production to Nigeria’s economic growth. By focusing on the often-neglected aspect of private sector credit, this study addresses an existing knowledge gap.

MATERIALS AND METHODS

The time series data used in this study are provided in the appendix. The variables include real GDP, agricultural output growth rate, gross capital formation, private sector credit to agriculture, inflation, and government expenditure. The data were sourced from the NBS (2022). To understand the characteristics of the series, we present descriptive statistics, unit root tests, and an OLS analysis. Secondary data were utilized, as they are appropriate for the nature of this research. Key data sources include the CBN Bulletin, the NBS, the World Development Index (WDI), and relevant literature such as journals, research papers, and electronic sources. The data covers the period from 1989 to 2021.

Theoretical Framework

This research is based on the Cobb-Douglas (C-D) production function, developed by Cobb and Douglas in 1928. This model offers a framework for analyzing the supply side of agricultural potential output, primarily driven by quantifiable input factors. As a homogeneous production function, it illustrates the relationship between output and the combination of inputs, indicating that

if inputs increase by a constant factor, output will also increase by the same factor. One significant benefit of this model is its capability to quantify the marginal contribution of each input to overall production. It also helps assess how efficiently farmers use resources like labor and capital to boost production and reduce costs, while clearly measuring the impact of each input on overall agricultural output. The C-D production function is specified as follows:

$$\log Q = \beta_0 + \beta_1 \log K + \beta_2 \log L + \mu \dots(1)$$

Equation (1) is modified to serve as the model of the present study as presented in equation (2).

Model Specification

Empirically, this work modifies Adeyemi (2016) work by including private sector credit to agriculture in the study. The model is presented as follows in accordance with the theoretical framework:

$$RGDP = f(GRAO, GCF, PSC, INF, GEXP) \dots(2)$$

Where,

- RGDP= Real Gross Domestic Product
- GRAO=Growth rate of Agricultural output
- GCF = Gross Capital Formation
- PSC = Private Sector Credit to Agricultural Sector
- INF = Inflation Rate
- GEXP= Government expenditure

Mathematically, equation 3.2 is expressed as:

$$RGDP = GRAO + GCF + PSC + INF + GEXP$$

Econometrically, the model is specified as:

$$RGDP = \beta_0 + \beta_1 GRAO_t + \beta_2 GCF_t + \beta_3 PSC_t + \beta_4 INF_t + \beta_5 GEXP_t + \mu \dots(3)$$

Where,

- β_0 = Constant Term / Parameter Intercept
- $\beta_1 - \beta_4$ = Parameters to be estimated
- μ_1 = Error Term

Taking the natural logarithmic form:

$$RGDP = \beta_0 + \beta_1 \ln GRAO_t + \beta_2 \ln GCF_t + \beta_3 \ln PSC_t + \beta_4 \ln INF_t + \beta_5 \ln GEXP_t + \mu \dots(4)$$

Where,

In = natural Logarithm

RESULTS AND DISCUSSION

Table 1: Summary of Descriptive Statistics Result

	RGDP	GRAO	GCF	PSC	INF	GEXP
Mean	3.056667	13.50545	34.30121	1.998394	2.355515	4.676061
Median	3.300000	13.06000	31.99000	1.690000	1.480000	4.890000
Maximum	9.670000	43.21000	64.35000	5.790000	7.900000	9.250000
Minimum	-2.220000	3.470000	15.45000	0.500000	0.510000	1.570000
Std. Dev.	2.618249	7.275932	13.56379	1.200004	2.067347	2.400336
Skewness	0.205341	2.185137	0.406982	1.424103	1.226962	0.240119
Kurtosis	2.993622	9.764685	2.204371	4.990602	3.287502	1.844286
Jarque-Bera	0.231963	89.18284	1.781399	16.60282	8.393555	2.153667

Probability	0.890492	0.000000	0.410369	0.000248	0.015044	0.340673
Sum	100.8700	445.6800	1131.940	65.94700	77.73200	154.3100
Sum Sq. Dev.	219.3673	1694.054	5887.247	46.08028	136.7655	184.3716

Source: Researcher's computation using EVIEWS 9

The result shows that real GDP over the period of study stood at 3.05 percent obtaining a maximum of 9.67% in 2021. The growth rate of agricultural output accounted for about 43.2 percent over the period of study. The descriptive statistics shows that an average of 5.8 percent and 4.9 percent of the private sector and government expenditure accounted for the growth of agricultural

produce in the economy respectively while inflation rate stood at 7.9 percent over the years.

Unit Root Test

The unit root test using ADF test was conducted to avoid misleading results and the result is presented in Table 2.

Table 2: Summary of Unit Root Test

Variables	ADF Statistics at Level	ADF Critical level at 0.05	Order of Integration
RGDP	-6.085975	-2.963972	I(0)
LGRAO	-5.800876	-2.957110	I(0)
LGCF	-9.395590	-2.960411	I(0)
LPSC	-8.026478	-2.960411	I(0)
LINF	-7.127630	-2.960411	I(0)
LGEXP	-8.314511	-2.960411	I(0)

Researchers' Computation Using e-view

The findings indicate that RGDP, the growth rate of agricultural output, gross capital formation, private sector credit to agriculture, the inflation rate, and government expenditure are all stationary at their levels.

Johansen Cointegration Technique

Decision Rule

Suppose the trace statistic exceeds the critical value at the 5% (0.05) significance level. In that case, you reject the null hypothesis, which states that there is no cointegrating

Table 3: Decision Rule

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.940937	194.0923	95.75366	0.0000
At most 1 *	0.822249	109.2181	69.81889	0.0000
At most 2 *	0.702506	57.39699	47.85613	0.0049
At most 3	0.391125	21.02621	29.79707	0.3560
At most 4	0.173185	6.141957	15.49471	0.6787
At most 5	0.014452	0.436731	3.841466	0.5087

relationship among the variables, and accept the alternative hypothesis, indicating that a long-term relationship exists among the variables being studied.

From the table above, there exists at most 2 cointegrating relationships among the variables under study. Hence, we can state that there is a long relationship among variables under study.

Ordinary Least Square Technique

The null hypothesis cannot be rejected since, as Table 4 demonstrates, the chi-square probability is more than 5%. In accordance with OLS's presumptions, we therefore draw the conclusion that the model shows no signs of heteroskedasticity.

Table 5 presents a summary of the T-test results. It

indicates that the growth rate of agricultural output, private sector credit to the agricultural sector, inflation, and government expenditure significantly contribute to explaining economic growth, as their T-test values exceed the T-critical value at the 5 percent significance level. In contrast, GCF is not significant in explaining economic growth.

Hypothesis One

Hypothesis one posits that agricultural production significantly affects economic growth in Nigeria. From the t-test, we found that the value of 6.4641 is greater than 2.055. As a result, we reject H0 and conclude that agricultural production positively and significantly impacts economic growth in Nigeria.

Table 4: Summary of OLS

Dependent Variable: RGDP				
Variable	Coefficient	Std. Error	T-Statistics	Prob.
C	50.9461	5.7735	4.2470	0.0002
LGRAO	2.0362	3.8730	6.4641	0.0000
LGCF	-7.6857	0.2477	1.7672	0.6497
LPSC	3.4645	6.4441	3.8583	0.2562
LINF	-2.2689	4.5988	3.9919	0.0004
LGEXP	0.5231	2.4567	2.2350	0.0453
R-Squared	0.9400	F.Stat.	28.0428	
Adjusted R2	0.9207	F(Stat)Prob	0.0001	
Durbin Watson	1.2346			

Source: Researchers' Computation Using eview

Table 5: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-Statistics	0.8041	Prob. F (5,27)	0.5567
R-Squared	4.2774	Prob. Chi square (5)	0.5102
Scaled explained ss	2.8747	Prob. Chi square (5)	0.7193

Source: Researchers' computation using e-view 9

Table 6: Summary of T-Test

Variables	T-test	T-critical value at 0.05 level	Assessment
LGRAO	6.4641	2.055	Significant
LGCF	1.7672	2.055	Not Significant
LPSC	3.8583	2.055	Significant
LINF	3.9919	2.055	Significant
LGEXP	2.2350	2.055	Significant

Source: Researchers' Computation 2023

Hypothesis Two

This hypothesis asserts that private sector credit to agriculture significantly influences economic growth in Nigeria. We evaluated this hypothesis using the T-test and found that private sector credit to agriculture has a

T-test value of 3.8583, which exceeds the critical value of 2.055. Therefore, we reject H0 and conclude that private sector credit to agriculture significantly impacts economic growth in Nigeria.

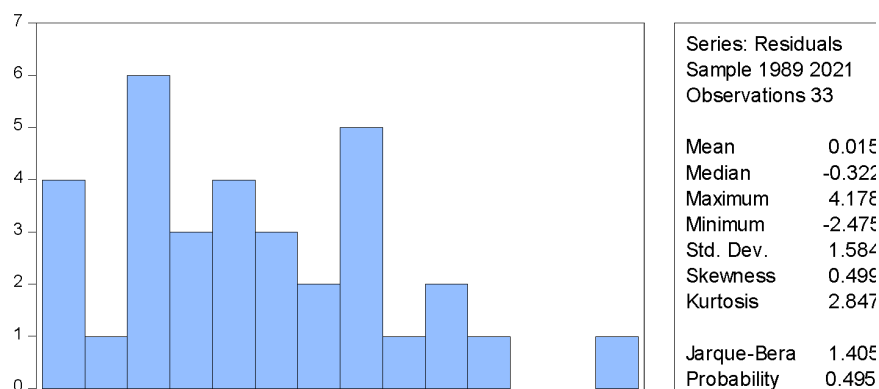


Figure 1:

Discussion

The analysis indicated that a 1% increase in agricultural

production is projected to result in an average increase of 6.46% in economic growth in Nigeria. The study shows

a positive and significant correlation between agricultural production and economic growth, suggesting that as agricultural production increases, economic growth also rises. These findings align with those of Adeyemi (2016), who also reported that agricultural production positively and significantly impacts Nigeria's economy. This effect is attributed to increased agricultural productivity, such as the cultivation of cash crops, which enhances economic performance in the country.

Additionally, the study found a positive relationship between private sector credit to agricultural output and government expenditure regarding economic growth, suggesting that a 1% increase in agricultural production will typically result in a 3.85% increase in economic growth in Nigeria. The findings indicate that private sector credit significantly influences economic growth; providing farmers with credit for purchasing equipment like tractors and fertilizers boosts crop yields, thereby enhancing economic growth.

Conversely, the results show that GCF, which measures total investment in the economy over a specific period, does not impact economic growth, as a 1% increase has no effect. The study also identifies a negative and significant relationship between the inflation rate and economic growth in Nigeria, which can be linked to reduced purchasing power, instability, and uncertainty that tend to deter investment and economic growth.

Furthermore, the analysis found that an increase in government expenditure positively impacts real GDP, indicating that government spending significantly contributes to Nigeria's economic growth. This is consistent with findings from Dike (2017), which also highlighted the positive impact of agricultural production on the economy. The R-squared of 0.9400 indicates that 94% variations in RGDP are explained by the growth rates of agricultural output, private sector credit, GCF, inflation rate, and government expenditure, while the remaining 6% is attributed to the error term. The F-statistic value of 28.04, indicates that the variables are jointly statistically significant at the 5% level, as the critical F value of 2.59 is less than 28.04.

CONCLUSION

After using the OLS technique to analyze the relationship between agricultural production and economic growth in Nigeria and assessing a number of explanatory factors, the researcher come to the conclusion that there is a positive and statistically significant correlation between the growth rate of agricultural output and economic growth in the nation. In addition, the analysis reveals that economic growth is positively and significantly impacted by private sector credit to agricultural, although gross capital formation has no significant effect.

However, inflation was negative but significant with RGDP. Due to these findings, the study suggests that the government should strive to establish a favorable environment for directing credit to the agricultural sector in Nigeria. This can be achieved through monetary policies

from the central bank, such as mandating the commercial banks to provide loans and credit facilities to agricultural participants. Moreover, it is essential to empower farmers to sell their products at fair prices, which may involve the government purchasing excess produce from farmers, particularly during harvest seasons, at guaranteed minimum prices. Appropriate agencies should be charged with the responsibility of channeling credits to players in the agricultural sector as this will increase efficiency and overall prosperity of the nation. Finally, the government should make the investment climate conducive for private foreign investors in agriculture who can help in boosting productivity in the sector.

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