AGRICULTURAL PRODUCTION AND ECONOMIC GROWTH IN NIGERIA FROM 1986 to 2021

[1]Uzoechina, Benedict Ikemefuna, [2]Okeyika, Okezie Kenechukwu, [3]Ikechebelu Anthonia Ifeoma
[4]Ozulumba John Ifeanyi, and [5]Ekwoh, Geraldine Amaka

[1,2,3]Department of Economics, Nnamdi Azikiwe University, Awka
[4]Unieducation Office, 3rd Floor, Woverly House, United Kingdom
[5]Department of Economics, University of Nigeria, Nsukka

Correspondence: ko.okeyika@unizik.edu.ng; +234-8032657559

Abstract
This study examines the relationship between agricultural production and economic growth in Nigeria from 1986 to 2021. One of the major concerns of developing countries, including Nigeria, is the attainment of a stable and satisfactory economic growth. However, over the decades, the value of real Gross Domestic Product (RGDP) has been low, and the actual growth rate of RGDP has frequently fallen below the targeted growth rate, suggesting that the economy may be growing below its potential. This declining trend in Nigeria's economic growth in Nigeria has become a cause for concern and necessitates policy intervention. The objective of this study is to investigate the relationship between disaggregated agricultural production and economic growth in Nigeria. Annual time series data sourced from the Central Bank of Nigeria Statistical Bulletin and World Development indicators were utilised. The study adopted Autoregressive Distributed Lag (ARDL) testing approach to estimate the relationship between the dependent and independent variables. Results indicate that all four components of agricultural production - crop, livestock, forestry and fishery – have a positive and statistically significant relationship with economic growth in both the short-run and long-run. Among these, forestry, fishery and livestock production made a greater impact than crop production. Based on these findings, the study recommends that the government incentivizes investments in these sub-sectors rather than placing excessive emphasis on crop production. This strategy could attract private sector investment, enhance employment opportunities, growing the GDP, and increase food production.
Keywords: Crop production, Livestock production, forestry production, Fishery production and Economic growth
JEL CODES: G10, O40, C33.

1. Introduction

There are several sectors that make up an economy across all economic systems. These include the education sector, health sector, manufacturing sector, industrial sector, foreign/external sector, agricultural sector, etc. The importance of these sectors to the growth and development of an economy cannot be overemphasized. However, the agricultural sector stands out given that directly or indirectly; it serves as the bedrock of the other sectors.
Healthy, sustainable, and inclusive food systems are critical to achieving the world's development goals. Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity, and feed a projected 9.7 billion people by 2050 (World Bank, 2021). Growth in the agriculture sector is two to four times more effective in raising incomes among the poorest compared to other sectors. Agriculture is also crucial to economic growth: accounting for 4% of the global gross domestic product (GDP) and in some least developing countries, it can account for more than 25% of the GDP (World Bank, 2021).

Agriculture is an integral part of the world's economy, mainly for developing countries. It is the primary source of employment, income, and food, and these basic needs are fulfilled by agriculture all over the world. According to the Food and Agriculture Organization (FAO), the share of the agricultural population is 67% of the total population. It recorded 39.4% of the GDP and in that 43% of all exports include agriculture commodities (FAO, 2021). It is evident that for the last few years, the role of agriculture in world economic development has gone through important progress (FAO, 2021).

Agricultural production is divided into four components: namely crop production, livestock production, forestry production and fishery production. Crop production refers to the lawful, non-personal cultivation and harvesting of plants, tree crops, row crops, or field crops on an agricultural or commercial basis, including packaging and processing. It also includes the cultivation of flowers, fruits, vegetables, and ornamental trees. Livestock production involves the rearing of animals for both consumption and commercial purposes. Livestock farming systems produce milk, meat, and other animal products for human use. Forestry production is the process of growing and managing trees as a renewable resource for timber, biomass, ornamental use, or energy. It includes the production of trees for direct timber sales, ornamental plantings, composite products, and use as a combustion

energy source. Fishery involves the commercial breeding and raising of fish, typically for food, in controlled environments such as fish tanks or artificial enclosures like fish ponds.

2.0. Literature Review:

Tolulope and Chinonso (2013) investigated the contribution of the agricultural sector production to economic growth in Nigeria using the growth accounting framework and time series data from 1960 to 2011. Applying the Granger Causality technique, they found that the agricultural sector has contributed positively and consistently to economic growth in Nigeria, reaffirming agriculture to economic growth is further affirmed from a causality test which showed that agriculture growth Granger-causes GDP growth, however no reverse relationship was found. The resilient nature of the sector is evident in its ability to recover more quickly than other sectors from shocks resulting from disruptive events like the civil (1967-70) war and Economic recession (1981-85) periods.

Oyinbo and Grace (2014) carried out a study to provide empirical information on the relationship between agricultural production and the growth of Nigerian economy with focus on poverty reduction. Time series data which covered between 1985-2013 were employed in this research and the analyses of the data were done using unit root tests and the bounds (ARDL) testing approach to cointegration. The result of the data analysis indicated that agricultural production was significant in influencing the favourable trend of economic growth in Nigeria. Despite the growth of the Nigerian economy, poverty is still on the increase and this calls for a shift from 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.

Abdul and Awan (2015) investigated the impact of agriculture productivity on economic growth. The secondary source of data covering the time series period 1972 to 2012 is employed. They used the auto regressive distributed lags method (ARDL) to estimate the economic growth. Different variables are used such as real gross domestic production per capita gross capital formation, employed labor force, inflation rate, trade, openness, agriculture value added. The inflation rate has negative effect on economic growth while all other variables are positively related to economic growth. The study concludes that big share of agriculture contributes more in economic growth and suggests that government should enhance employed labor force by increasing the higher education in both agriculture and industrial sector.

Amire and Temitope (2016) carried out an empirical investigation on the effect of agricultural production on economic growth in Nigeria, using annual time series data from 2000 to 2014. The research employed the Ordinary Least Square (OLS) method. Empirical results indicate that there is, indeed a long-run relationship between agricultural productivity and economic growth. All the variables including, the GDP contribution of the agricultural sector, gross expenditure on agriculture and gross access to bank (agricultural) loans/credit had the expected positive signs in the Nigerian economy and were also tested in relation to economic growth by using the Pearson correlation co-efficient. The findings have a strong implication on agricultural policy in Nigeria. The study suggest that a concerted effort should be made by policy makers to concentrate on the productivity of the agricultural sector in order to boost its production capacity, which would enhance productivity of output and in turn stimulates economic growth.

Urmi and Mallick (2017) examined how agricultural production contributes to the economic growth in India during 1991-2012. The log-linear regression growth model is used where the gross domestic product is the dependent variable and the explanatory variables are the five major crops namely; cereals, tobacco, tea, coffee, and sugarcane. The regression analysis was performed using E-views-7. It is found that the production of tea, cereals, and tobacco are positively affecting the GDP growth in India whereas coffee and sugarcane production is having an inverse relationship with economic growth though not insignificant. Therefore, a decline in agricultural production has been accompanied by declines in GDP growth. Therefore, it is suggested that proper training for farmers, adequate storage marketing, and insurance and irrigation facilities should be provided to encourage them to increase production.

Olabanji and Emmanuel (2017) examined the long-run relationship between agricultural production and economic growth in Nigeria for the period 1981 to 2014 using time series data. Results from Johansen's maximum likelihood co-integration approach and Vector error correction model support evidence of a long-run relationship between agricultural output and economic growth in Nigeria. Granger causality test also confirms the co-integration results indicating the existence of causality between agricultural output and economic growth in Nigeria. The paper, therefore, recommends that the government should further strengthen agricultural policies in the area of funding, storage facilities, and market access to enhance agricultural production. Policy Strategies that will make

agriculture more profitable and attractive, and less laborious with improved technology should be adopted and promoted to attract investors and the youths back to agriculture.

Afolabi (2018) examined the impact of agriculture production on economic growth in Nigeria, with the objective of determining the relationship between the agricultural sector and the economic Growth rates in Nigeria. The research was aimed at examining the contributions of agriculture (value added) to the growth of the national economy, investigating government expenditure on agriculture in Nigeria, and determining the contributions of crop production from agriculture on the Nigerian economy. Data covering the period 1985 - 2017 were collected from the World Bank Data base and CBN statistical bulletin. Co-Integration and Vector Error correction model techniques were employed as well as the Granger Causality test to determine the causality relationship between Agriculture and Economic Growth. As a result of the data collected, analyzed and interpreted, the research found that agriculture has positive and long run impact on economic growth in Nigeria. The study recommends amongst many other things that the Government of Nigeria should put in more efforts to diversify the Nigerian economy as the Nigerian agricultural sector currently suffers a lot of marginalization which has not enabled it to contribute more significantly as it should.

Comfort and Temitope (2019) carried out an empirical investigation on the effect of agricultural productivity on economic growth in Nigeria, using annual time series data from 2000 to 2018. The paper employs the Ordinary Least Square (OLS) method. Empirical results indicate that there is, indeed a long-run relationship between agricultural productivity and economic growth. All the variables including, the GDP contribution of the agricultural sector, gross expenditure on agriculture and gross access to bank (agricultural) loans/credit had the expected positive signs in the Nigerian economy and were also tested in relation to economic growth by using the Pearson correlation co-efficient. The findings have a strong implication on agricultural policy in Nigeria. The study suggest that a concerted effort should be made by policy makers to concentrate on the productivity of the agricultural sector in order to boost its production capacity, which would enhance productivity of output and in turn stimulates economic growth.

Oyinbo and Grace (2019) carried out a study to provide empirical information on the relationship between agricultural production and the growth of the Nigerian economy with focus on poverty reduction. Time series data that covered 1981 - 2018 were employed in this research and the analyses of the data were done using unit root tests and the bounds (ARDL) testing approach to cointegration. The result of the data analysis indicated that agricultural production was significant in influencing the favourable trend of economic growth in Nigeria. Despite the growth of the Nigerian economy, poverty is still on the increase and this calls for a shift from monolithic oil-based economy to a more plural one with agriculture being the lead sector. The study suggests that government agricultural policies and poverty alleviating strategies should focus on the rural areas.

Mathew and Iku (2019) examined the impact of agricultural production on Nigeria's economic growth from 1986 – 2018. The study used the Autoregressive Distribution Lag (ARDL) econometric technique to analyze the long-run relationship and the impact of agricultural exports on Nigeria's economic growth. Economic growth is the dependent variable and is proxied by the real gross domestic product, the explanatory variables include: agricultural output, foreign direct investment, inflation rate and the labour force. The results from the ARDL technique revealed that agricultural production significantly affect Nigeria's economic growth; this suggests that, a 1 percent increase in agricultural production will boost economic growth in Nigeria by approximately 25 percent. Hence, it is strongly recommended that the country should prioritize agricultural production and consider the sector as the preferred destination in its current economic-activity diversification drive.

Karomou (2020) analyzed the impact of agricultural production on economic growth in West Africa using the case of Benin. Time series data covering the period of 1961 to 2019 were used. The data were analyzed through a Vector Error Correction Model (VECM). The results reveal that there is a long run, or equilibrium, relationship between agricultural output, industrial output, capital and GDP. The error correction model indicates that 21.6 percent of the discrepancy between long run and short run GDP is corrected within a year. The variance decomposition shows that the largest contribution to shocks in GDP is its feedback shocks. The contribution of agricultural output to shocks in GDP is less than 2% for the first three-year period and about 6% for the ten-year period. Capital contribution to shocks in GDP is about 3% for the first three years and more than 15% for the ten-year period. Hence, apart from feedback and capital shocks, GDP is most influenced by agricultural output. Therefore, capital formation is primordial to economic growth in Benin but the economic activity upon which capital should be primarily invested is agricultural production. The study therefore suggests that there is the need for the Nigerian government and its citizenry to concentrate their combined efforts towards increasing the productivity capacity of the agricultural sector with the aim of promoting food security and economic growth.

Bosede (2020) examined the impact of agricultural productivity on economic growth in Nigeria between the periods of 1981 to 2019. The Johansen cointegration test was employed to determine the existence of long run relationship between agricultural productivity and economic growth. Error Correction Model (ECM) was employed to determine the short run impact of agricultural productivity on economic growth. From the results, it was found that the agricultural labour productivity and agricultural value added were the positive determinants of economic growth. The study concluded that improvement in the performance of the agricultural sector has a significant effect on economic growth in Nigeria. The study therefore suggests that the government should encourage labour force participation in the agricultural sector by increasing investment in the agricultural sector. Oyatade (2021) carried out a study on the long-run relationship, specifically between agricultural production and economic growth in Nigeria. In order to holistically interpret the relationship between the variables examined, a numerical approach known as the block method is adopted to a mathematical model developed for the variables using the logistic growth model, in order to predict the dataset for years 2020 to 2025. This implies that the study made used of annual data for the period of 1981 to 2025. The econometric analysis was conducted using the ARDL bound test approach to examine the connection between the nation's agricultural output and economic growth. The findings indicate the existence of long-run relationship among variables, likewise short-run relationship. The pairwise granger causality test shows that there is one-way causality moving from agriculture to economic growth. This indicates that agricultural output leads to economic growth, but economic growth does not lead to agricultural output. The results approve the positive link between agricultural output and economic growth, which is helpful to improve the nation's economic outlook. Hence, this study emphasized and suggested the need to support agricultural sector through economic policies and finances.

Ali and Haladu (2021) carried out a study on the short-run and long-run relationship among agricultural output, government expenditure, and economic growth in Nigeria using annual time series data from 1985 to 2019. The Zivot-Andrew unit root test indicates that gross domestic product, agricultural output, and exchange rate are stationary at first difference while government expenditure is stationary at level. The Gregory-Hansen test with structural break has confirmed the existence of a cointegration relationship among the variables employed. The Autoregressive Distributive Lag (ARDL) model with break indicates that, in the short-run agricultural output has a negative and statistically insignificant effect on real gross domestic product Nigeria, government expenditure has a positive and statistically significant effect on real gross domestic product in Nigeria, and the exchange rate has a positive and statistically significant effect on real gross domestic product in Nigeria. The break-point coefficient has positive and statistically significant. The long-run result shows that agricultural output has a positive effect on the real gross domestic product in Nigeria, government expenditure has a positive effect on real gross domestic product in Nigeria, and the exchange rate has positive effects on the real gross domestic product in Nigeria. The break coefficient shows positive and statistically significant. The study recommends that the Nigerian government should reduce the lending rate on agriculture and provide incentives to the farmers, this will encourage farmers to borrow and consequently, agricultural output will increase and the Nigerian government should increase its expenditure on agriculture to boost the sector and achieve higher economic growth.

Sunday and Udoka (2021) carried out a study on the relationship between agricultural sub sector's production and the growth of Nigerian economy (proxy by the per capita GDP). Time series data spanning 1983 - 2020 were employed in this research and the analyses of the data were done using descriptive tests, unit root tests, multivariate regression based on the autoregressive regressive distributed lag (ARDL) testing bound model approach to cointegration. The result of the data analysis indicated that the agricultural sub sector's production significantly influences the movement of the per capita GDP of Nigeria in both short and long-run periods. The implication of the finding justifies the need for agricultural production intensification as a panacea for sustainable economic growth in the country. The prioritization of the agricultural sector and intensifying agricultural production as means of accelerating economic growth in the country were strongly recommended.

Talga and Ameji (2021) examined the impact and relationship between agricultural production and economic growth in Nigeria for the period of 1981 to 2017. The study was guided by two research questions and objectives. The Ordinary Least Square (OLS) and Johansen Co-Integration test were employed for the hypotheses of the study. Results from the OLS regression model shows that agricultural production had a positive and significant relationship on economic growth therefore, provides evidence that agricultural sector contributes significantly to GDP growth in Nigeria. The findings also show that at 5 percent critical level, agricultural production increases economic growth by 5 percent. The Co-integration test result indicated that there exists a long run relationship among the variables. The contribution of agricultural production of 5 per cent is however low. It is recommended that pro poor policies should be designed for alleviating rural poverty and this should be centered on diversifying the Nigerian economy with agriculture as the driver of the economy so that the benefits of economic growth will trickle down to the agro-based rural population that constitute a larger proportion of the population of Nigeria.

Therefore, all tiers of government and the private sector should be fully involved in pursuing the course of agricultural development for the growth of Nigerian economy and ultimately poverty reduction.

Theoretical Literature Review

Solow-swan neo-classical growth model holds that capital is subject to diminishing returns in a closed economy. Given a fixed stock of labor, the impact on output of the last unit of capital accumulated will always be less than the one before. Economic growth and development are dynamic processes, focusing on how and why output, capital, consumption and population change over time. The Solow-model focuses on four variables:
Real Output (Y), Capital (K), Labour (L), Knowledge (A) Roomer, 2009). These are combined to produce output. The function take the forms

$Y_t = A^t K^{\alpha}_t L^{\beta}_t$

This implies that output is a function of Labour and Capital.

3.0 Methods

The model specified is to show a theoretical relationship between agricultural production and economic growth in the Nigerian economy. The model is Solow neoclassical growth model which has been made to incorporate other variables that determines economic growth. Solow growth model is usually stated in this form.

$Y_t=A^tK^{\alpha}_tL^{\beta}_t$

The study model is specified below

$RGDP_t$= f (K, L, CP, LS, FOR, FIS)
(1)

$RGDP_t = \beta_0+\beta_1GCF+\beta_2LEMP+\beta_3CP+\beta_4LS+\beta_5FOR + \beta_6FIS+ \mu$ (2)

However, there is the need to standardize the variables to interpret their partial slope coefficients in terms of elasticity, hence the natural log of the variables is used. This is expressed below:

$RGDP_t = \beta_o + \beta_1GCF + \beta_2LEMP + \beta_3LOGCP + \beta_4LOGLS + \beta_5LOGFOR +\beta_6LOGFIS + \mu$ (3)

Where:

$RGDP_t$ = Real Gross Domestic Product; GCF = Gross Capital Formation; LEMP = Labour Employed; CP = Crop Production; LS = Livestock; FOR = Forestry; FIS = Fishery; t = Time Period; β 's = structural Parameters to be estimated; μ = Stochastic Error Term; β_0= Constant Term

Our study employed annual time series data from Central Bank of Nigeria (CBN) statistical Bulletin and World Bank Development Indicator which covers the period of 1986 to 2021. ARDL- Auto Regressive Distributed Lag Model technique was used to estimate the relationship between agricultural production and economic growth in Nigeria. The estimation Starts with Unit Root Test to confirm the Stationarity of the variables adopted. Co-integration test was also conducted to determine Long run Relationship between these variables.

4.0 Results and Analysis.

Unit root test results in order to test for the stationarity, Dickey Fuller (ADRL) test was adopted. The unit root test results were presented in table 1.

Table 1: Unit Root Test for the variables

VARIABLES	ADF STATISTICS	ADFCRITICAL VALUE (AT 5%)	PROBABILITY VALUES	ORDEROF INTEGRATION
RGDP	-3.85	-3.5484	0.0257	Level (1)
GCF	-4.61	-3.548	0.0041	Level (1)
LAB	-5.85	-3.548	0.0002	Level (1)
CROP	-5.64	-3.548	0.0003	Level (1)
LST	-6.81	-3.552	0.0000	Level (0)
FOR	-6.42	-3.548	0.0000	Level (1)
FIS	-5.42	-2.538	0.0001	Level (1)

Source: Authors' Computation, 2023 using E-views 10.0

Evidence from the unit root table above shows that the study or model variables are stationary at levels and first difference.

Table 2: Auto Regressive Distributive lag (ADRL)short run results.

Dependent Variable: LNRGDP	Method: ARDL			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
LNRGDP(-1)	0.471061	0.157950	2.988	0.0204
GCF	0.007094	0.001864	3.804	0.0067
LABEMP	0.013597	0.006887	2.979	0.0490
LNCROP	0.162800	0.051780	3.141	0.0163
LNLIVESTOCK	1.042322	0.346119	3.011	0.0196
LNFORESTRY	3.020700	0.948365	3.185	0.0154
LNFISH	0.389154	0.092609	2.905	0.0040
C	10.99629	1.782522	6.168	0.0005
CointEq(-1)*	-2.047164	0.125652	-16.2	0.0000
R-squared	0.749892			
Adjusted R-squared	0.728523			
F-statistic	2707.927			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	2.327049			

Source: Authors' Computation, 2024 using E-views 10.0

The short-run results indicate that all the independent variables have positive and significant relationship with real gross domestic product (RGDP). However, only forestry (302%), livestock (104%), past RGDP (47%), FISH (39%) and CROP (16%) had prominent and very significant impact on RGDP. Furthermore, about 73% of the variations in RGDP is explained by the independent variables showing a strong explanatory power of the independent variables. The Durbin Watson statistics also shows the absence of serial correlation. The ECM is negative and significant showing an evidence of long run convergence.

Table 3: Auto Regressive Distributive lag (ARDL) long run results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGCF	0.00016	0.00053	0.23615	0.0199
LABEMP	0.01029	0.00314	3.23435	0.0144
LNCROP	0.07302	0.04263	1.71413	0.0302
LNLIVESTOCK	0.26872	0.12100	2.22032	0.0518
LNFORESTRY	1.21371	0.12875	9.42546	0.0021
LNFISH	0.72914	0.04231	2.31212	0.0204
C	5.37145	0.46710	11.4937	0.0000

Source: Authors' Computation, 2023 using E-views 10.0

From table 3, the long run relationship between real gross domestic product and the variables are shown. However, there is a positive and statistically significant relationship between GCF, LABEMP, LNCROP, LNLIVESTOCK, LNFORESTRY, LNFISHRY and real gross domestic product.

Discussion of findings

Results revealed that the components of agricultural production have a positive and significant impact on economic growth in Nigeria. These findings are consistent with those of **Ali and Haladu (2021)** and **Oyatade (2021)**, who also found that agricultural production contributes significantly to economic growth.

Although **forestry, fishing, and livestock** made a greater impact than **crop production**, the latter has received the most attention from both the public and private sectors of Nigeria's economy. There is a need to shift focus towards the other components of agricultural production, as they also hold significant potential for transforming the Nigerian economy, boosting employment, and reducing poverty.

5.0. Conclusion

Economic growth is sine qua non for higher standard of living and prosperity of any nation. To achieve higher growth, diversification of the economy must be pursued. This present study was undertaken with a view to looking at the individual components of agricultural production and determining their individual impact on growth for informed policy decisions. Results show that these components of agricultural production are not only beneficial for economic growth in the long run but are also beneficial in the short run. This shows that economies that invest in the four components of agriculture will reap bumper harvest than economies that invest in few or those that show complete neglect of these components.

Recommendations

Based on the findings from the analysis above, we therefore recommend the following:

A. Flood, in the recent past, has become a big issue confronting farmer and has swept away their investment in a twinkle of an eye. Policy to address flooding such as creating water channels and dams, dredging rivers and controlling erosion sites to contain excessive flood has become more imperative.

B. Policies to resolve all manner of conflicts, especially the farmer-herder clashes, must be put in place especially establishment of grazing reserves that will stop open grazing.

C. Afforestation policy should be aggressively and deliberately pursued. Evidence shows that there has been neglect in this regard and the high cost of fuel, gas and kerosene will drive people to resort to firewood as a source of fuel, thereby endangering our forest reserves and the wild animals that use it as their living abode. Therefore, a reward system (buy back at attractive mark-up margin) should be put in place for private sector investment in afforestation.

D. Skill acquisition programmes and grants/credit should also be prioritized by government and private organizations in order to boost fish production and raise more people who have the capacity for fish production.

References

Abdul, O., & Awan, S. (2015). The contributions of agriculture sector on economic growth of Nigeria. *International Journal of Economics and Financial Issues*, 7, 547–552.

Abula, D., & Ben, L. (2019). Agriculture, rural development and pro-poor growth: Country experiences in the post-reform era. World Bank: Agriculture and rural development discussion paper, No. 21.

Adams, A. (2017). Agricultural sector credit and output relationship in Nigeria: evidence from monlinear ARDL. *CBN Journal of Applied Statistics*, 8 (1), 101–122.

Adams, D. (2016). Lessons from agricultural policies and programmes in Nigeria. Journal of Law, Policy and Globalization, 5, 11–21.

Afolabi, K. (2018). "Productivity in the agricultural sector". A research paper presented by the assistant director, research department, Central Bank of Nigeria.

Agrawal, E. (2019). The agricultural sector and economic development: The Nigeria experience. *Journal of Management and Enterprise Development*, 7, 1–15.

Ahmed, D. (2013). Agricultural productivity and economic growth: Impact analysis from Nigeria *Scientific Research Journal*, 5(2), 1–7.

Ali, D., & Jiang, P. (2016). Agricultural productivity and economic policies: Concepts and measurements, *OECD Working Paper No. 75*, OECD Development Center

Ali, D., & Haladu, F. (2021). The role of agricultural production in economic growth in Nigeria. *American Economic Review,* 92 (2), 160-164.

Amire, O., & Temitope, G. (2016). The empirical investigation of the nexus between agricultural and industrial sectors in Nigeria. *International Journal of Business and Social Science,* 3(8), 225–230.

Anderson, G. (2018). An empirical analysis of the contribution of agricultural sector to Nigerian gross domestic product: Implications for economic development. *Developing Country Studies,* 5(21), 36–42.

Awan, S. (2014). An autoregressive distributed lag modelling approach to cointegration analysis. In S. Storm (Ed.), Econometrics and Economic Theory in 20th Century: The Ragnar Frisch Centennial Symposium. Cambridge University Press.

Babalola, D. (2012). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association,* 74(3), 427– 431.

Babulo, E. (2019). Cost-effective agriculture growth options for poverty reduction in Nigeria: Evidence and policy implications. AIAE Research Paper 6. African Institute for Applied Economics

Berges, K., & Crutzen, O. (2016). Land in Africa market asset or secure livelihood? Proceedings of the and Summary of Conclusions from the Land in Africa Conference Held in London

Bernard, E. (2015). Analysis of the contribution of agricultural sector on the Nigerian economic development. *World Review of Business Research,* 1(1), 191–200.

Bosede, D. (2020). Government expenditure on agriculture and economic growth in Nigeria. *International Journal of Science and Research (IJSR)*. 188-194

Diewert, S., & Nakamura, G. (2015). Impact of government expenditure on agricultural growth in Nigeria: Empirical evidence from Kogi State. *International Journal of Intellectual Discourse (IJID),* 3(1), 666 – 680.

Eboh, D. (2017). A dynamic analysis of oil revenue and the performance of the agricultural sector in Nigeria. *Journal of Economics and Public Finance,* 2(1), 203–219.

Emeka, O. (2017). Challenges and opportunities to the African agriculture and food systems. *African Journal of Food, Agriculture, Nutrition and Development,* 19(1), 14190–14217

Food and Agriculture Organization (2021). The future of food and agriculture: Trends and challenges. Rome.

Fulginiti, D., & Perrin, P. (2018). Agriculture and poverty reduction: Literature review and outstanding issues. International Workshop on the Role of Agriculture in Poverty Reduction. Centre for Strategic Economic Studies Victoria University, Melbourne, 6 May 2018.

George, D. (2018). The contribution of agricultural sector on economic growth of Nigeria. *International Journal of Economics and Financial Issues,* 7(1), 547–552.

Henry, T. (2017). Efficient tests for an autoregressive unit root. *Econometrica,* 64(4), 813–836.

Ikala, D. (2015). Agricultural productivity and macro-economic variable fluctuation in Nigeria. *International Journal of Economics and Finance,* 4(8), 114–125.

Karamou, F. (2020). Agricultural production matter for economic growth? Empirical evidence from Nigeria. *Journal of Finance and Economics,* 1 (1), 61-77.

Lescuyer, T. (2016). Analysis of the contribution of agricultural sector on the Nigerian economic development. *World Review of Business Research,* 1, 191–200.

Mathew, O., & Iku, U. (2019). Raging poverty and agricultural output in Nigeria: An empirical investigation. *Journal of Economics and sustainable Development,* 5(6), 63-72.

Millennium Ecosystem Assessment (2021). A social accounting matrix approach. *International Journal of Food and Agricultural Economics,* 1(1), 49-62.

Mullen, C., & Crean, M. (2017). Poverty coping strategies of oil palm farmers in AkwaIbom State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment,* 15(1), 20–30.

Narahari, G. (2019). The contributions of agriculture sector on economic growth of Nigeria. *International Journal of Economics and Financial Issues,* 7, 547–552.

Odey, E. (2019). Agriculture and economic growth in Tunisia. *China Agricultural Economic Review,* 2(1), 63–78.

Odoemelam, Y. (2018). Price transmission and market integration: A test of the central market hypothesis of geographical markets for cassava products in Nigeria. *Global Journal of Pure and Applied Sciences,* 15(3-4).

Ogen, O. (2017). Agriculture as an engine of growth and poverty reduction: What we know and what we need to know. A framework paper for the African economic research consortium project on "understanding links between growth and poverty reduction in Africa. African Economic Research Consortium, Nairobi.

Oji-Okoro, D. (2017). Technical efficiency of small-scale cassava-based processors (Cassava grater operators) in Eket agricultural zone of AkwaIbom state, Nigeria. *Nigerian Journal of Agriculture, Food and Environment,* 16(3), 137–149.

Olagunju, O. (2019). A three-factor agricultural production function: the case of Canada. *International Economic Journal,* 12(3), 63-75.

Olayide, L., & Heady, D. (2017). The political economy of maize production and poverty reduction in Zambia: Analysis of the last 50 years. *Journal of Asian and African Studies* 46 (6): 546-566.

Oyatade, A. (2021). Drivers and sustainability of agricultural growth in Nigeria. AIAE Research Paper 8. African Institute for Applied Economics, Enugu.

Oyinbo, P., & Grace, O. (2014). Agricultural production and economic growth in Nigeria: Implication for rural poverty alleviation. *Quarterly Journal of International Agriculture*, 53(3), 207–223

Powell, E. (2015). Agriculture resource and economic growth in Nigeria. *European Scientific Journal*, 8(22), 103–115.

Reinhard, B. (2013). Trend analysis of the contribution of agriculture to gross domestic product. *Journal of Agricultural and Veterinary Science*, 7(1), 50–55.

Talga, D., & Ameji, P. (2020). Impact of agricultural output on economic development in Nigeria *Archives of Current Research International.* 4(1), 1-10.

Tolulope, G., & Chinonso, O. (2013). Effect of agricultural, manufacturing and service sector performance in Nigeria, 1980–2011. *Journal of Economics and Sustainable Development*, 4, 35–41.

Vedeld, D. (2017). The saving and investment nexus for China: Evidence from cointegration tests. *Applied Economics*, 37(17),

Worldbank (2021). Agriculture: An engine for growth and poverty reduction. Available at: http://www.worldbank.org/ida. Accessed 18 March 2023.

Wunder, O. (2014). The empirical investigation of the nexus between agricultural and industrial sectors in Malaysia. *International Journal of Business and Social Science*, 3(8), 225–230.