

# The Empirical Analysis of Agricultural Sector and Its Contribution to Economic Growth in Nigeria

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## Abstract

This paper analyses the Nigerian agricultural sector. Its main objective is to empirically examine the contribution of agricultural sector to Economic growth in Nigeria. The analytical framework employed in this study is Ordinary Least Squares (OLS) technique and Histogram-Normality Test, using the data of Nigerian economy covering the period of 1981 to 2018 sourced from its Central Bank (CBN) and World Development Indicators (WDI). The findings of the study revealed that, agricultural sector has significantly contributed to economic growth in Nigeria. Similarly, it has also been discovered that, the agricultural output in Nigeria has increased significantly especially from 2016 to 2018. The paper recommended that the Nigerian government should give more emphasis to its agricultural sector as it significantly contributes toward its economic growth, employment generation and food security for many years.

**Keywords:** Growth, Agriculture, Economic, Sector.

## 1. INTRODUCTION

An attempt to achieve rapid and stable economic growth and development has always been an objective of every nation across the world. That can only be achieved with the direct contribution of agriculture particularly in developing economies. Thus, the relationship between agriculture and economic growth cannot be over emphasized. Agricultural sector in Nigeria has been an engine that was propelling the economic growth before the oil was discovered in Nigeria in 1956 at Olaibiri in the Niger Delta after half a century of exploration. It has been among the important sectors in the Nigerian economy, with about 70% of the total population engaged in it particularly in the rural and sub-urban areas. The proportion of Gross Domestic Product (GDP) attributed to agricultural sector holds 40% (CBN, 2009).

Nigeria has a highly diversified agro-ecological condition, which makes possible the production of a wide range of agricultural products. Hence, agriculture constitutes one of the most important sectors of the economy. The sector is particularly important in terms of its employment generation and its contribution to Gross Domestic Product (GDP) and export revenue earnings. The Gross Domestic Product (GDP) measured at constant basic prices, grew by 1.9% in 2018, compared to 0.8% in 2017. The non-oil sectors drive the growth with 2.0% increase, while oil sector output grew by 1.1%. The services, agricultural, industrial and construction sectors contributed 1.1%, 0.5%, 0.3% and 0.1%, respectively, to GDP growth, while the trade sector contributed negative growth of -0.1% (CBN, 2018). This clearly shows that, the agricultural sector significantly contributed to recent growth in Nigerian economy apart from services sector, where the growth in output (agricultural sector output) was attributed to: sustained implementation of the Anchor Borrowers' Programme and fiscal stimulus which led to increased infrastructural spending following sustained implementation of the Economic Recovery and Growth Plan.

Furthermore, the sectorial GDP growth (%) of the major real sectors of Nigerian economy as shown by the Central Bank of Nigeria Annual Report (2018), clearly indicates that, the agricultural sector grew with 2.9%, 4.3%, 3.5%, 4.1%, and 3.4% of year 2013, 2014, 2015, 2016 and 2017/2, respectively. This shows that, the sector has not recorded any negative growth in comparison with industrial sector that recorded -0.1%, -3.8% and -9.4% of year

2013, 2015 and 2016, successively. Similarly, the construction, trade and services sectors also recorded negative growth through 2015 and 2016, 2016 and 2017/2, and year 2016 and 2017/2, respectfully.

In the periods of oil boom in Nigeria from 1973-1983, the agricultural sector was neglected and more concentration was given to oil sector. There was a remarkable increase in the foreign exchange earnings, and the nature of Nigerian economy was seen to be “off the land and into the water”, though when Structural Adjustment Programme (SAP) of (1986) was launched with the support from International Monetary Fund (IMF) and World Bank, the agricultural and business regulations, trade policies and foreign exchange systems were reformed. In a study of Odetola and Etunmu (2013) opined that, the importance of agricultural to the Nigerian economy is evident in the nation’s natural endowments in production factors such as extensive arable land, water, human resources, favorable weather and climatic condition, and capital. Hence, the economic growth in Nigeria will be almost impossible to achieve without developing the sector, and exploring the nation’s productive advantage in this sector is the fastest way to stimulate growth in the economy.

Therefore, the main objective of this paper is to empirically examine the contribution of agricultural sector to economic growth as well as the relationship between the agricultural sector and economic growth in Nigeria using ordinary least squares (OLS) technique. The paper also follows with reviewing the empirical literatures and conceptual framework, methodology, results and discussion of findings, and ends with the conclusion and summary of the study.

## **2. LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

### **Nigeria’s Agricultural Sector**

Nigeria is one of the largest countries in Africa, with a total geographical area of 923,768 square kilometers and an estimated population of about 126 million (2003 estimate). It lies wholly within the tropics along the Gulf of Guinea on the western coast of Africa. Nigeria has a highly diversified agro-ecological condition, which makes possible the production of a wide range of agricultural products. Hence, agriculture constitutes one of the most important sectors of the economy. The sector is particularly important in terms of its employment generation and its contribution to Gross Domestic Product (GDP) and export revenue earnings. Agriculture is an important sector of the economy with a high potentials for employment generation, food security and poverty reduction. However, these potentials has remained largely untapped which has led to the dwindling performance of the agricultural sector both domestically and in the international trade over years. As at 1961, Nigeria was the leading exporter of groundnut with a world’s share of 42%. The country also had 27% of the world’s palm oil export, 18% of cocoa and 1.4% of cotton as the major West African cotton exporter. It has been a sector where more than 60% of the country’s population and the proportion of the Gross Domestic Product (GDP) attributed to agriculture holds about 40% (UNCTAD, 2018).

That advantage however declined over years particularly in the years of oil discovery (1956) and that of the years of oil boom in (1973-1983) hence, the Nigeria dominance in the export of groundnut was eclipsed by China, United States of America (USA) and Argentina as at 2008. Indonesia and Malaysia took over in palm oil, Cote d’voire and Ghana also become the leading exporter of cocoa while Mali and Burkina Faso led cotton exports. The competitors maintained their dominance due to strong marketing organizations that linked the farmers to markets and provided support in the form of improved planting material, fertilizer, credit and rural infrastructure. Consequently, it is estimated that Nigeria has lost a US\$10 Billion (1.6 Trillion Naira) annual export opportunity from groundnut, palm oil, cocoa and cotton alone due to continuous declines and stagnations in their exports. Thus food imports are growing at an unsustainable rate of 11% per annum. Nigeria was the world largest importer of United States hard red and white winter wheat with an annual import of 635 billion of Naira. It is also the second largest importer of rice (356 billion of Naira), sugar (217 billion of Naira) and fish (97 billion of Naira), Federal Ministry of Agriculture and Rural Development FMARD, (2011).

The Nigeria’s agricultural sector in a historical perspective can be said to have experienced the four distinct agricultural policy phases, The first phase spanned the entire colonial period and the first post-independence decade from 1960 to about 1969; the second covered the period from about 1970 to about 1985; the third phase started from about 1986 in the structural adjustment period; and, the fourth was what could be characterized as the post-structural adjustment era, starting from about 1994 Mayong et al, (2003). Some of those policies and programmes include; Agricultural Commodity Marketing and Pricing Policy such as the establishment of six national commodity boards in 1977 to replace the regional, multi-commodity boards that had been operating since 1954. The six new national

commodity boards were for cocoa, groundnut, palm produce, cotton, food grains and rubber. Another policy was Input Supply and Distribution Policy that also include Centralization of fertilizer procurement and distribution in 1975, the creation of a national network of agro-service centers and the creation of a National Seed Service (NSS) in 1972. Similarly, the Water Resources and Irrigation Policy was introduced with the establishment of eleven River Basin Development Authorities in 1977, the Agricultural Input Subsidy Policy, Agricultural Credit Institution, Agricultural Research and Development like a decree promulgated in 1971 created Agricultural Research Council of Nigeria, agricultural and business regulations under the Structural Adjustment Programme (SAP, 1986), guaranteed credit to agriculture under ACGSF, the sustained implementation of the Anchor Borrowers' Programme, and provision of subsidized fertilizer and agricultural inputs particularly of 2015-2017 by the current Nigeria's president, Muhammadu Buhari among others.

### 3. AGRICULTURAL SECTOR AND ECONOMIC GROWTH IN NIGERIA

Literally, economic growth refers to an economy that is getting bigger, not necessarily one that is getting better. According to Singh (2017), defined economic growth as an increase in the production and consumption of goods and services. It is indicated by increasing gross domestic product (GDP). Economic growth occurs whenever people take resources and rearrange them in ways that make them more valuable. To grow, an economy requires more natural capital, including soil, water, minerals and energy sources. When the economy grows rapidly or get too big, this natural capital is depleted.

The agricultural sector has been among the important sectors propelling the growth of Nigerian economy. Agriculture is an important sector of the economy with a high potentials for employment generation, food security and poverty reduction. However, these potentials has remained largely untapped which has led to the dwindling performance of the agricultural sector both domestically and in the international trade over years. As at 1961, Nigeria was the leading exporter of groundnut with a world's share of 42%. The country also had 27% of the world's palm oil export, 18% of cocoa and 1.4% of cotton as the major West African cotton exporter (FMARD, 2011).

In the study of Ijirshar (2015) pointed out that, agriculture, the second sector after oil, fell from 48% of GDP in 1970 to 20.6% in 1980 and was only 23.3% of GDP in 2005 (CBN, 2009). The sector's contribution to the growth of the Nigerian economy in 2012 stood at 39.21% and 41.93% improvement in the third quarter of 2013. This is because agricultural output continued to experience improved production in 2013. The sector recorded growth rate of 3.83% in the fourth quarter of 2012 as against 5.68% in the fourth quarter of 2011. Likewise, output in the third quarter of 2013 stood at 5.08% up from the 3.89% recorded in the corresponding period of 2012 and also higher than the 4.52% recorded during the second quarter of 2013 with a low level of job creation as compared to education, financial intermediation, among others (NBS, 2020).

However, the Gross Domestic Product (GDP) measured at constant basic prices, grew by 1.9% in 2018, compared to 0.8% in 2017. The non-oil sectors drive the growth with 2.0% increase, while oil sector output grew by 1.1%. The services, agricultural, industrial and construction sectors contributed 1.1%, 0.5%, 0.3% and 0.1%, respectively, to GDP growth, while the trade sector contributed negative growth of -0.1% (CBN, 2018). This clearly shows that, the agricultural sector significantly contributed to recent growth in Nigerian economy apart from services sector, where the growth in output (agricultural sector output) was attributed to: sustained implementation of the Anchor Borrowers' Programme, fiscal stimulus which led to increased infrastructural spending following sustained implementation of the Economic Recovery and Growth Plan as well as the Agricultural Transformation Agenda of 2011 by president Goodluck Ebele Jonathan with the aim of growing the Nigeria's agricultural sector. Moreover, the sectorial GDP growth (%) of the major real sectors of Nigerian economy as shown by the Central Bank of Nigeria Annual Report (2018), clearly indicates that, the agricultural sector grew with 2.9%, 4.3%, 3.5%, 4.1%, and 3.4% of year 2013, 2014, 2015, 2016 and second quarter of 2017, respectively. This shows that, the sector has not recorded any negative growth in comparison with industrial sector that recorded -0.1%, -3.8% and -9.4% of year 2013, 2015 and 2016, successively. Similarly, the construction, trade and services sectors also recorded negative growth through 2015 and 2016, 2016 and second quarter of 2017, and year 2016 and second quarter of 2017, respectfully (CBN, 2018).

#### Review of Empirical Studies

In view of the importance of agricultural sector to economic growth, especially in developing countries like Nigeria, a number of empirical studies have been carried out on agriculture and economic growth. In the work of Ijirshar (2015) which focused on analyzing the agricultural export and economic growth from 1970 to 2012. The cointegration test showed that, long run relationship exists among the variables (real GDP, real exchange rate, real agricultural output, index of trade openness and inflation). From the error correction method shows that agricultural export has contributed positively to Nigerian economy. In the same vein, Odetola and Etunmu (2013) found that from 1960 to 2011, agricultural sector has contributed positively and consistently to economic growth in Nigeria, reaffirming the sector's importance in the economy. It was further affirmed using granger causality test which showed that agriculture growth granger-causes GDP growth, and reverse relationship was found.

Likewise, Helali et al (2014) in his empirical study on efficiency impact of the agricultural sector on economic growth in Togo from 1990 to 2009, the findings according to stochastic frontier analysis (SFA) and data development analysis (DEA) methods show that, the Tongolese agriculture is generally inefficient and the agricultural labour in Togo is shrinking the cultivation and production tends to stagnate. However, Subramaniam and Reed (2009) in their study estimate an econometric model that incorporates the linkages among agriculture, manufacturing, service and trade sectors using a vector error correction model for Poland and Romania. Three cointegrating vectors for Poland and one for Romania confirm that the different sectors in the Poland and Romania moved together over the sample period, their growth rates are interdependent. The long-run relationship results show that the industrial sector in Poland contributes positively to the agricultural sector while the growing service sector shows mixed results. The results of Romania indicate that the industrial sector is detrimental to agriculture however, the service sector contributes positively. While the role of agriculture in the short-run is not significant to the other sectors, but it made a positive impact on the industrial sector in Romania. Similarly, in consonant with the study of Subramaniam and Reed (2009), Mayong et al, (2003) on their work on Agriculture in Nigeria: identifying opportunities for increased commercialization and investment from 1970 to 2001, the results of performance analysis show a mixed performance. The share of agriculture in both aggregate GDP and non-oil GDP increased only marginally in the 1981-2000 period covered. There was a lack of consistency in the growth performance of the agricultural sector in the 1981 to 2000 period, with some evidence of unstable or fluctuating trends, probably due to policy instability and inconsistencies in policies and policy implementation.

#### 4. METHODOLOGY

The paper used the secondary data of Nigerian economy from 1981 to 2018 which was sourced from the country's Central Bank and World Bank Development Indicators (WDI) to empirically assess the contribution of agricultural sector on economic growth in Nigeria.

The basis on which the model is grounded and predicted is simple linear relationship between real gross domestic products (GDP) as dependent variable on the one hand, and on the other hand, independent variables which include, real agriculture output, consumption expenditure, inflation and lag value of real GDP.

The model is rooted in the works of Ujirshar (2015), Odetola & Etunmu (2013) and Subramaniam & Reed (2009) which was modified and used here. It can be expressed as follows;

$$RGDP = f(RAGR, CONSEXP, INFL, RGDP_{-1}) \dots \dots \dots \text{eq}(1)$$

The equation is also expressed in log-linear form as follows;

$$\ln RGDP = \beta_0 + \beta_1 \ln RAGR + \beta_2 \ln CONSEXP + \beta_3 \ln INFL + \beta_4 \ln RGDP_{-1} + U_t \dots \dots \dots \text{eq}(2)$$

Where: RGDP = Real Gross Domestic Product  
 RAGR = Real Agriculture Output  
 CONSEXP = Consumption Expenditure  
 INFL = Inflation  
 $U_t$  = Random Error Term

$\beta_0$  is the constant, while  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  and  $\beta_4$  are the coefficients of real GDP, real agriculture output, inflation and lag of real GDP, respectively.

However, the first step of the estimation is running the conventional regression analysis using Ordinary Least Squares (OLS) method and descriptive statistics for normality test.

## 5. RESULTS AND DISCUSSION OF FINDINGS

This section presents the results of conventional regression model and stationarity tests for all the variables.

**Table 1 Conventional Regression Model of Equation 2**

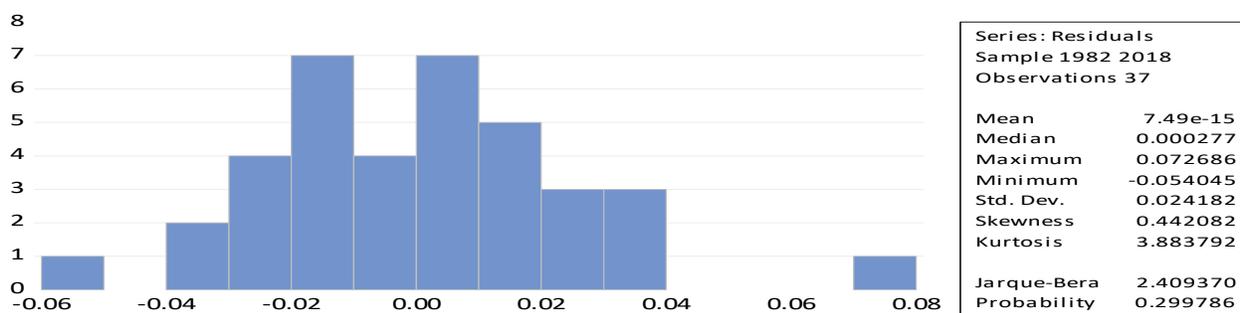
Dependent Variable: LNRGDP				
Method: Least Squares				
Date: 04/08/20 Time: 22:26				
Sample (adjusted): 1982 2018				
Included observations: 37 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.369546	0.241643	5.667630	0.0000
LNAGR	0.276102	0.042250	6.534888	0.0000
LNCONSEXP	0.009176	0.020964	0.437686	0.6646
LNINFL	-0.004513	0.006489	-0.695374	0.4918
LAGLNRGDP	0.669167	0.047645	14.04490	0.0000
R-squared	0.998127	Mean dependent var		17.19388
Adjusted R-squared	0.997892	S.D. dependent var		0.558693
S.E. of regression	0.025649	Akaike info criterion		-4.363534
Sum squared resid	0.021052	Schwarz criterion		-4.145842
Log likelihood	85.72537	Hannan-Quinn criter.		-4.286787
F-statistic	4262.186	Durbin-Watson stat		1.610095
Prob(F-statistic)	0.000000			

**Source:** Researcher's Computation using Eviews 11

Table 1 above presents the result of the regression model of equation (2). The results show that two out of the four coefficients were statistically significant at 5% level and theoretically have correct signs. The coefficient of determination ( $R^2$ ) and adjusted  $R^2$  are very strong at 0.998127 and 0.997892, respectively. This shows a very strong explanatory power of the independent variables in explaining change in the dependent variable, which is real GDP. Furthermore, the value of (Prob) F – statistic shows that the independent variables are jointly significant at 5% level. And the Durbin Watson (W.D) statistic, also reveals the absence of autocorrelation in the series.

Hence, the implication of the above result shows that the stated model in Nigeria can be predicted using the specified explanatory variables. That is to say, real agriculture output (LNAGR) and lag value of real GDP (LAGLNRGDP) possess a positive relationship and significant impact on LNRGDP where the results predict a 1% increase in LNAGR will lead to 25% and 67% increase in the LNRGDP, respectively. Similarly, real consumption expenditure (LNCONSEXP) has a linear relationship with insignificant impact on LNRGDP. While for inflation rate (LNINFR), the results predict a nonlinear and insignificant impact on LNRGDP in Nigeria.

**Table 2 Result of Test for Normality**



Source: Researcher's Computation using Eviews 11

From the above table, the results show that the data is normally distributed with a Jarque Bera statistic of 2.41 and a corresponding P-value of 0.23 which is above 0.5 criterion for rejecting the null hypothesis. Hence, the data have the skewness and kurtosis matching a normal distribution, that is to say, it is positively skewed with a value of 0.44 and a kurtosis of 3.88.

## 6. CONCLUSION

This paper empirically analyzed the contribution of agricultural sector to economic growth in Nigeria using ordinary least squares (OLS) technique. It used the secondary data of Nigerian economy from 1981 to 2018 which was sourced from the country's Central Bank and World Bank Development Indicators (WDI).

The results from this study shows that, the coefficients of real agricultural output (lnRAGR) and lag value of the dependent variable (lnRGDP) were both significant and positively related to Nigerian real GDP, which were also consistent on a priori grounds. While the coefficients of consumption expenditure (lnCONSEXP) and inflation (lnINFL) were insignificant, and to the inflation was negatively related to the RGDP of Nigeria. Furthermore, the result also shows that the data has a normal distribution and positive skewness as tested using Histogram- Test for Normality.

Therefore, the findings of this paper shows that, agricultural sector has significantly contributed to economic growth in Nigeria from the specified time of period. Similarly, it has also been discovered that, the agricultural output in Nigeria has increased significantly particularly from 2016 to 2018. The paper recommended that the Nigerian government should give more emphasis to its agricultural sector as it significantly contributes toward its economic growth, employment generation and food security for many years.

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