International Journal of Advanced Studies in Ecology, Development and Sustainability | IJASEDS
ISSN Print: 2354-4252 | ISSN Online: 2354-4260
Volume 5, Number 1 June, 2018

Effect of Agricultural Output on Economic Growth in Nigeria (1981-2016)

Oguwuike, Wisdom Tobechi
Department of Agricultural and Applied Economics,
PMB 5080, Rivers State University, Port Harcourt, Nigeria

Abstract

This study examined the effect of agricultural output on economic growth of Nigeria (1981-2016). Specifically the objectives of the study are to examine the effect of crop production, livestock, fishery and forestry on economic growth in Nigeria. Secondary data on GDP, crop production, livestock, fishery and forestry was obtained from the CBN statistical bulletin. The econometrics methods of ordinary least square, Co-integration, error correction mechanism were used for the analysis. The outcome of the ADF unit root test show that the variables (GDP, crop production, livestock, fishery and forestry) were stationary. Also the co-integration result showed that there exist co-integration amongst the variables in the model. The Parsimonious Error Correction Model indicates that the R^2 is 86% meaning that the dynamic model is a good fit. The Durbin Watson value of approximately 2.0, indicates a lesser level of autocorrelation, meaning that the successive values of the error term are serially dependent or correlated. Moreover, the first and third lags of GDP are positively and significantly related to current level of economic growth. The coefficient of crop production is positively signed and statistically significant at 5 percent level with GDP. The coefficient of fishing is positively signed but statistically not significant at 5 percent level with GDP. The coefficient of livestock is positively signed and statistically significant at 5 percent level with GDP. The coefficient of forestry is negatively signed but statistically significant at 5 percent at level with GDP. Based on these results, this study recommends the following: Nigerian government should put good structures in place that allows better and higher agricultural output; The various state government should look beyond the monthly federation allocation account as their major source of revenue for developmental projects but work towards utilization and exploitation of fallow lands in their states for farming; Agricultural institutions should be revived, revamped and some privatized with proper supervision for better productivity; Long term agricultural development plans/projects that are realistic should be created and executed; Nigeria government should increase budgetary allocation to the agricultural sector and ensure effective utilization of the funds/budgets that translates into improved and increased production or output annually; Agricultural credit schemes should be encouraged, strengthened and made easily accessible to farmers for increased agricultural output; Subsidization and availability of agricultural inputs for farmers that translates into higher output; Nigerian government should create secured and enabling environment for commercial farming that minimized subsistence farming and there should be workable and lasting solution towards resolution of crisis between farmers and herdsmen.

Keywords: *Economic growth, Economic development, GDP, Agricultural output, Crop production, Livestock, Fishery, Forestry*.

Corresponding Author: Oguwuike, Wisdom Tobechi

http://internationalpolicybrief.org/journals/international-scientific-research-consortium-journals/intl-journal-of-ecology-vol5-no1-june-2018

Background to the Study

The agricultural outputs of various kinds have been made possible in Nigeria due to its diversity in agro-ecological conditions. Nigeria has abundance of natural resources favourable to agricultural production (Arokoyo, 2012). As far back as early 1960's, Nigerian economy prospered on the agricultural sector as it was seen as the main pillar for growth and development. Agricultural sector is still the major benefactor in low and middle income countries (emerging countries) as it is a source of inputs, foods, employment opportunities, raw materials for manufacturing and other industries, source of foreign exchange from exportation of agricultural products and the benefit of the value added in the numerous production process (Okoro, 2011). The size of contribution of agriculture in most African economies implies that the plan to advocate and raise the initial stages of economic growth cannot neglect or relegate the whole of agriculture. (Anriquez & Stamoulis, 2007).

Precedent to oil boom in the 1950s and 1960s the agricultural sector constituted over 63 percent and 54 percent of Nigeria Real Gross Domestic product (RGDP). But sequel to the discovery of oil, Nigeria reported reduction in terms of share contribution of agriculture to RGDP in the range of 29.2 percent and 33.3 percent between 1970 and 1980 (Aigbokhan, 2011).

Due to unstable nature and performance of agriculture in the country, government at different levels have over decades instituted and carried out many policies and projects aimed at restoring agriculture to its veritable position in the economy. But evidence from empirical literatures reveals that there is no breakthrough yet as a result of many problems facing the performance of the sector (Yusuf, 2014). Economic growth and development process is perceived as one of the greatest desire of any poor nation. And that of Nigeria is impacted by agriculture through the provision of food and fiber for home consumption, human labour supplies to the industrial sector, foreign exchange generation through exports of agricultural products, rise in domestic saving and the purchasing power of the rural populace (Poonyth et.al. 2001).

Statement of the Problem

The country Nigeria is bestowed with enormous resources for agricultural use and vast available land for crop cultivation and rearing of animals. The agricultural sector of Nigeria was well known for the exportation of agricultural products such as rubber, cocoa, groundnut, palm oil, hides and skin etc. The sector has a huge ability for economic growth and development of Nigeria. The difficulties that agricultural sector face led to decline in contribution of the sector to the Nigerian economy. This has made Nigerian government to be able to come up with many policy decisions and programs to improve agricultural production in Nigeria.

Upon that Nigeria has large expanse of rich soil, good number of citizens have issue with hunger and starvation due to relegation of agriculture to the background. Some existing industries are highly dependent on importation of required raw materials in their productive activities and good number of youths remain unemployed after graduation from schools (Noko, 2015). Nigeria was one of the leading countries in the exportation and production of

some major agricultural products between 1940 and 1950. This has really change in recent times as the economic growth and development of Nigeria is mainly dependent on the revenue from oil exports. This over reliance on crude oil has affected the Nigeria market forces as well as its economic growth and development (Okoh, 2004). Moving into competitive market in western countries with our agricultural products other than crude only needs to be looked into to be able to attain a successful and sustainable economic growth and development in Nigeria (Bekun, 2015).

Harnessing Nigeria agricultural endowment wisely will help diversify the economy and reduce over reliance on the oil sector and an importation. Nigeria economy has been inconsistent due to unstable oil price and continues rise in the price of import goods. All these challenges have undesirable effect in Nigeria balance of payment, employment level and other sectors productivity as well as purchasing power of the people (Oyinbo, et. al. 2014).
This study seeks to answer the following research question;

i. What is the effect of Agricultural Output on economic growth in Nigeria?
ii. Does increase in production of Crop, Livestock, Fishery and Forestry increase economic growth in Nigeria?

Objectives of the Study

The general objective of this study is to examine the effect of agricultural output on economic growth in Nigeria from 1981-2016. Specifically, this study was designed to;

i. Examine the effect of crop production on economic growth in Nigeria.
ii. Determine the effect of fishing on economic growth in Nigeria.
iii. Determine the effect of livestock on economic growth in Nigeria.
iv. Examine the effect of forestry on economic growth in Nigeria.

Research Hypotheses

This study is guided by the following hypothesis.

Ho1: there is no significant relationship between agricultural output and economic growth in Nigeria.
Ho2: there is no significant relationship between crop production and economic growth in Nigeria. Ho3: there is no significant relationship between livestock production and economic growth in Nigeria.
Ho4: there is no significant relationship between fishing and economic growth in Nigeria.
Ho5: there is no significant relationship between forestry and economic growth in Nigeria.

Literature Review

Theoretical Framework

Endogenous Growth Theory: The theory states that for any country to experience economic growth, investment in human capital, innovation and knowledge are inevitable. The theory emphasize why it's very important for both the public and private sector to motivate people to be innovative. The theory believes that diversifying an economy properly in other non-oil sector is likely to influence the economic growth via the following three ways; performance of the agricultural sector, manufacturing sector and solid mineral.

Input-Output Theory: The theory explained the inter-relationship that exist between industries in an economy as input in one industry is regarded as output of another industry. The development of the theory was focused towards evaluating and measuring the relationship that exist between major sectors of an economy. The theory proposed that all sectors of an economy are mutually dependent on one another as the output produced from one sector makes up the input of another sector in the same economy. For instance, the output from agricultural sector say maize is seen as a raw material input for the manufacturing sector for the manufacture of cornflakes, flour, starch, etc. Recognizing and harnessing the role inter-dependence of different sectors play as provided by the input-output theory is essential for greater economic growth.

Rostow's Stages of Economic Growth Theory: In this theory, Rostow (1960) historically approaches economic and development process through five stages which are; traditional society; pre-conditions for take-off or transitional stage; take-off itself; drive to maturity and age of high mass-consumption. According to Rostow, the take-off stage is the most essential figure in the life of a society when growth becomes its normal condition. The significance and essence of the traditional society makes a positive progress and a multiple interest gets built into the society structure with agriculture playing an important role at this stage. It was the source of income of the state and the nobles. It is evident from the theory that agriculture is a force. In the first three stages of economic growth and development (traditional society, pre-conditions for take-off and take-off stages), the agricultural output strongly affects industrial and economic structure from which nation's economic growth and development can take-off. Thus, agricultural productive activities are more centered, focused and more implemented in the less developed economies where there is pressing need for rural transformation, income redistribution, poverty reduction and socio-economic growth and development.

Relationship between Agriculture and Economic Growth: The Connection

Agricultural output growth can increase growth in the non-agricultural sector of the economy via diverse means some of which are direct and indirect. According to Johnston and Mellor (1961) agriculture adds to economic growth and development via five inter-sectorial connections. The sectors of the economy are connected through the following: Provisions of surplus labour to firms in the industrial sector; Provision of food for domestic consumption; Supply of market for industrial output; Provision of domestic savings for industrial investment; Provision of foreign exchange from agricultural export and earnings to finance import of intermediate and capital goods. Block and Timmer (1994) argues that agriculture indirectly contributes to economic growth through its supply of improved caloric nutrient intake by the poor, availability of food, stability of food price and poverty reduction.

Agricultural output in higher dimension is very important for economic growth especially in continents like Africa, because of strong growth linkages and comparative advantages in trade. Greater agricultural output can yield beneficial results in three folds; sustained food security, higher human development and lower pressure on land and water (UNDP, 2012).

Nigerian Commitment toward Agricultural Output and Production

A commitment of successive Nigerian government toward agricultural sector was seen since the post-independence era through policy reviews that ensures that economic growth and development objective of the country is achieved. It has been that way given the abundant resources before the advent of the crude oil that has become the main source of revenue for Nigeria. The Nigerian government instituted and executed various policies and programs to be able to stabilize and enhance the agricultural sector. Some of these projects are still in existence while some have been abandoned and relegated due to their failure to achieve the targeted objectives. These programs include the Farm Settlement Scheme inaugurated in 1959, National Accelerated Food Production Program (NAFPP) established in 1972, Agricultural Development Projects (ADPs) launched in 1972, Nigerian Agricultural Cooperation and Rural Development Bank (NACRDB) established in 1973, River Basin Development Authorities (RBDAs) launched in 1976, Operation Feed the Nation (OFN) launched in 1976, Agricultural Credit Guarantee Scheme Fund (ACGSF) established in 1977, Green Revolution Program inaugurated in 1980 and Directorate of Foods, Roads and Rural Infrastructures (DFRRI) established in 1985, Structural Adjustment Program (SAP) launched in July 1986, National Economic Empowerment and Development Strategies (NEEDS) launched in 2004 (Essays UK, 2013).

Other mechanisms adopted by the Nigerian government to show commitment in improving agriculture were in the areas of credit schemes to give adequate support to rural farmers with the hope of ensuring adequate supply in the country. The Central Bank of Nigeria (CBN) has through these credit schemes made available various lending opportunities with lower interest rate for agricultural sector to be utilized by willing farmers. Successive governments in Nigeria till date have shown conscious effort to enhance the flow of credit to the agriculture. Some of the on-going credit schemes currently available for agriculture and its value chains are Commercial Agriculture Credit Scheme (CACS) introduced 2009; Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) launched in 2011; Micro, Small and Medium Enterprises Development Fund (MSMEDF) launched 2013.

Empirical Literature

Aristotle, Aristarchus and Warren Anderson etc. in the past furnished us with the account that the bedrock of growth and development of any nation lies within the scope of agriculture. The physiocrats in their philosophy are of the thought that agriculture is the backbone that supports growth and development of any economy. The physiocrats with all fate perceived the agricultural sector as the propeller of any economy whether developed or under developed (Bekun, 2015). Ahungwa et.al., (2014) studied the trend analysis of the impact of agriculture to GDP between 1960 to 2012 covering a period of 53 years using time series data. The structure shows that the agricultural sector has a superior lead over other sectors between 1960 and 1975 although there was a decline in the agricultural sector's share of GDP. The study revealed a fluctuation between the industrial sectors from 1967 to 1989 period. The regression analysis reveals a positive and significant relationship between the agricultural sector and GDP with the sector accounting 66.4 percent of the variation in the economy. It also reveals the dominance in the agricultural sector relative to other sectors of the economy.

In a study carried out by Olajide et.al (2012) on agricultural resources and economic growth in Nigeria he observed a positive relationship between GDP and agricultural output using ordinary least squares (OLS) econometric techniques in the period covering 1970 to 2010. From his work it was shown that agricultural sector reported for about 35 percent of the GDP. Although agricultural sector gain less support at the discovery of crude oil in commercial quantity.

In a study examined by Onunze (2012) on the impact of agricultural development on Nigerian growth within (1980-2010) the period of 30 years. The study clears the argument that has existed among development economist if agricultural sector holds the key to national development and industrialization. The study made use of OLS techniques and variables such as agricultural development, capital formation, inflation rate and interest rate to inquire on the question whether agricultural sector functions as a main driver to economic growth and development. It was empirically uncovered that a positive relationship exists between the agricultural sector and economic growth. In an empirical study on the contribution of agricultural sector on the economic growth of Nigeria, by Bekun (2015) covering the period of 33 year (1981 to 2013), Augmented Dickey-Fuller (ADF) test and Johansen Cointegration test were conducted. Real Gross Domestic Product (RGDP) per capita was used as the dependent valuable while agricultural output and oil rent were the explanatory variables. The study shows the pivotal and important role agricultural sector could play to the economic growth of Nigeria if given full attention.

In contradiction to other studies, Dim (2013) in his work titled "Does agriculture matter for economic development, empirical evidence from Nigeria", he used unit root test and Newey-west method to observe a different result that agricultural output has a negative impact on economic development but statistically significant in Nigeria.

Literature Review

From the review of previous literatures it is very obvious that so many empirical studies have established that a relationship exist between agricultural sector and economic growth in Nigeria. The reviews of the studies carried by different researchers have shown a positive relationship between agricultural output and economy of Nigeria. It was revealed that agricultural sector is viable and a propeller to economic growth. It plays a significant role in job creation, food sufficiency and foreign exchange earnings of the country. However, the review of one of the studies shows that though agricultural output is statistically significant in Nigeria, it has negative impact on economic growth and development. However, the literatures did not pay much attention to agricultural outputs itself (crop production, fishery, livestock, forestry) in relation to economic growth. This study will adopt different variables factoring in different time frame (1981 – 2016). This study is also different from other studies considering there has been changes in climatic condition, changes in technology, changes in perception and changes in governance in both agricultural sector and in Nigeria as a whole.

Methodology

Research Design

This research used the quasi-experimental design to be able to achieve the objectives of the study. Here the research adopted the econometric analysis techniques of ordinary least squares (OLS), multiple regression and co-integration/error correction methods. This research design is required because the issue for investigation is empirical, quantitative and analytical in nature where dependent and explanatory variables are observed over time frame for any change that may happen.

Types and Sources of Data Collection

The type of data necessary for this study is secondary because the research work is analytical in nature. Time series data relating to the dependent and explanatory variables were employed for a period covering 1981 and 2016. Data used in this study were sourced through Central Bank of Nigeria Statistical Bulletin.

Model Specification

The functional and econometric relationship between the dependent variable and the independent variables are seen in the equation below;

$$RGDP = f(CP, LS, FR, FS) \quad (1)$$

$$RGDP = a_0 + a_1CP + a_2LS + a_3FR + a_4FS + U \quad (2)$$

Where; RGDP = Real Gross Domestic Product; CP = Crop Production; LS = Livestock; FR = Forestry; FS = Fishery; U = Random variable or Error term.

On the a priori, we expect; $a_1 > 0$, $a_2 > 0$, $a_3 > 0$, $a_4 > 0$.

Technique of Data Analysis

The study employed the ordinary least squares (OLS), unit root, co-integration and error correction mechanism methods. The OLS was employed to examine the short run behavior of the variables under consideration. The unit root test was used to test for the order of integration of the individual times series under consideration. The unit root test used in this study is the Augmented Dickey-fuller (ADF). Augmented Dickey-fuller test relies on rejecting a null hypothesis of unit root in favour of the alternative hypothesis of stationary. Co-Integration Test of Johansen's procedure was used to determine whether or not the two variables are co-integrated. A lack of co-integration suggests that such variables have no long-run relationship. Error Correction Model (ECM) was used to ascertain the short run dynamics to long run equilibrium relationship and as well measure the speed of adjustment from the short-run equilibrium to the long-run equilibrium state.

In explaining the various methods, the following parameters test were used: the coefficient of determination (R^2 test) which measured the goodness of fit of a model; the T-test which was used to determine the individual significance of the explanatory variables; the F-test used to determine the joint significance of the explanatory variables; the Durbin-Watson test used to determine the presence of serial auto correlation.

Results and Discussion

Data presentation

Table 1: Data on Real Gross Domestic Product (RGDP), Crop Production (CP), Livestock (LS), Forestry (FR), Fishing (FS) (N' Billion).

YEAR	RGDP	CP	LS	FR	FS
1981	15,258.00	1,854.76	341.41	77.9	90.3
1982	14,985.08	1,897.08	361.12	73.91	93.86
1983	13,849.73	1,842.70	393.13	75.28	97.96
1984	13,779.26	1,759.12	399.69	76.69	68.01
1985	14,953.91	2,180.91	428.1	78.08	43.97
1986	15,237.99	2,427.10	421.63	86.59	51.51
1987	15,263.93	2,330.00	433.43	87.59	40.65
1988	16,215.37	2,581.60	444.27	88.91	59.79
1989	17,294.68	2,710.67	453.16	67.31	94.81
1990	19,305.63	2,828.59	462.22	72.61	101.29
1991	19,199.06	2,955.88	454.82	74.79	105.35
1992	19,620.19	3,044.55	458.92	76.51	94.81
1993	19,927.99	3,132.84	461.67	78.04	71.11
1994	19,979.12	3,226.83	466.29	80.07	66.49
1995	20,353.20	3,336.54	485.87	81.83	73.14
1996	21,177.92	3,463.00	499.96	82.24	88.35
1997	21,789.10	3,611.91	512.46	82.98	98.33
1998	22,332.87	3,752.77	526.3	83.98	112.2
1999	22,449.41	3,949.42	541.03	85.07	128.12
2000	23,688.28	4,067.90	553.48	86.35	133.25
2001	25,267.54	4,222.48	570.08	88.07	143.91
2002	28,957.71	6,977.88	597.5	88.69	153.02
2003	31,709.45	7,493.02	622.56	90.02	159.23
2004	35,020.55	7,956.66	663.03	95.87	173.02
2005	37,474.95	8,524.15	707.87	101.55	183.43
2006	39,995.50	9,162.65	756.73	107.66	195.43
2007	42,922.41	9,826.77	809.16	114.25	208.29
2008	46,012.52	10,437.99	864.19	121.22	221.97
2009	49,856.10	11,046.16	920.2	128.31	235.66
2010	54,612.26	11,683.90	979.56	135.72	249.71
2011	57,511.04	12,017.19	999.4	142.46	270.32
2012	59,929.89	12,919.54	972.76	146.09	291.31
2013	63,218.72	13,247.80	1,030.94	154.31	317.47
2014	67,152.79	13,793.45	1,086.85	161.34	338.75
2015	69,023.93	14,274.94	1,151.32	167.26	358.7
2016	67,931.24	14,894.45	1,185.12	171.64	356.13

Source: CBN statistical bulletin (Various Issues)

Discussion of regression OLS short-run regression result
Table 2: OLS Regression Results

Dependent Variable: GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6986.199	1712.645	-4.079186	0.0003
CP	1.423797	0.334486	4.256671	0.0002
FS	40.82133	10.33785	3.948725	0.0004
LS	19.72485	7.550018	2.612557	0.0137
FR	108.6725	31.77950	3.419580	0.0018

R-squared	0.996063	Mean dependent var	31757.15
Adjusted R-squared	0.995555	S.D. dependent var	18151.71
S.E. of regression	1210.185	Akaike info criterion	17.16318
Sum squared resid	45400995	Schwarz criterion	17.38311
Log likelihood	-303.9372	Hannan-Quinn criter.	17.23994
F-statistic	1960.769	Durbin-Watson stat	0.726110
Prob(F-statistic)	0.000000		

Source: Author's Computed Result from (E-View 8.1)

The short-run result in table 4.2aboveshowed that $R^2$is 0.996, indicating that the variation in economic growth (GDP) explained by crop production (CP), fishing (FS), livestock (LS) and forestry (FR) is 99 percent. Therefore, the explanatory power of the model estimated is 99 percent. This shows the goodness of fit of the model. The goodness of fit of the model was supported by the statistical significant of the entire regression model with F-Value of 1960.77 and the probability (F-statistic) of 0.000000.

Moreover, the coefficient of crop production (CP) variable appeared with positive sign and statistically significant at 5 percent level. This conforms to the apriori expectation. This means that a percentage increase in crop production will increase economic growth (GDP) in Nigeria. Also, the result shows that crop production significantly has effect on GDP in Nigeria. The coefficient of fishing (FS) variable appeared with a positive sign and statistically significant at 5 percent level. This conforms to the apriori expectation. This means that a percentage increases in volume of fishing will increase economic growth (GDP) in Nigeria. Also, the result shows that fishing significantly has effect on GDP in Nigeria during the period of study. The coefficient of livestock (LS) variable appeared with a positive sign and statistically significant at 5 percent level. This conforms to the apriori expectation. This means that percentage increases in livestock production will increase economic growth (GDP) in Nigeria. Also, the result reveals that livestock production significantly has effect on Nigerian GDP. The coefficient of forestry (FR) variable also appeared with a positive sign and statistically at 5 percent level. This conforms to the apriori expectation. It means that any percentage increase in forestry production will increase economic growth (GDP) in Nigeria. The result also shows that forestry significantly has effect on GDP in Nigeria during the period of study.

The Durbin Watson value of 0.73 is far from 2.0. This depicts the presence of serial autocorrelation, which means that the successive values of the error term are serially dependent or correlated. The analysis of the short-run so far shows that the OLS regression result is fairly good but its adoption for policy may be misleading due to existence of autocorrelation and high R-square. The reason for the above could be as a result of the non-stationarity of time series data that are used for the study. Hence, the unit root (Stationarity) test and long-run analysis carried out below to conform the long-run equilibrium of the model and resolve all inconsistencies in data variables.

Discussion of Unit Root Test for Stationarity

Table 3 Unit Root Stationarity Test for the Variables: Points of order of integration

Variables	ADF Test	Prob. Value	Critical Value			Order of Integration
			1% Critical Value	5% Critical Value	10% Critical Value	
GDP	-5.32937	0.0007	-4.26274	-3.55297	-3.20964	Order two
CP	-5.73292	0.0002	-4.25288	-3.548490	-3.20709	Order One
LS	-4.25288	0.0008	-4.222074	-3.548490	-3.207094	Order One
FR	-6.01423	0.000	-4.25288	-3.54849	-3.20709	Order One
FS	-7.39304	0.000	-4.28458	-3.56288	-3.21527	Order One

Source: Author's Computed Result from (E-Views 8.1)

In the stationarity test presented in Table 4.3 above the unit root process in each of the variables is examined using the Augmented Dickey-Fuller test methodology. The outcome of the ADF unit root test reported in the table was that GDP variable is stationary at second difference, that is integrated of order two [1(2)] while livestock, crop production, forestry and fishery variables are stationary at first difference, that is, integrated of order one [1(1)]. The same table showed that at various level of significance (1%, 5% and 10%) the entire variables (GDP, CP, LS, FR, and FS) in this study were stationary with probability value of less than 0.05. This therefore means that the best regression result will be obtained where the above variables are used to estimate the model. Reason being that using the OLS regression techniques at 'Levels' in estimating the model would lead to spurious regression result since all of the variables were not stationary.

Discussion of Johansen Test of Co-integration

Table 4: Test of co-integration for GDP model

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.896341	155.8945	69.81889	0.0000
At most 1 *	0.776676	83.36167	47.85613	0.0000
At most 2 *	0.501428	35.38941	29.79707	0.0102
At most 3	0.306878	13.11720	15.49471	0.1106
At most 4	0.042436	1.387603	3.841466	0.2388

The result in Table 4.4 above indicates that there are three co-integrating equations at 5% level of significance. This is because the trace statistic is greater than critical values at 5%. Based on the outcomes of the trace statistics, it therefore shows that there exists a long-run relationship or equilibrium among the variables. Given that there are three co-integrating equations, the requirement for fitting in an error correction model is satisfied.

Discussion of Error Correction Model (ECM)

Table 5: Parsimonious ECM for GDP Model

Dependent Variable: DLOG(GDP)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	107.7686	232.7484	0.463026	0.6489
D(GDP(-1))	1.308617	0.278596	4.697187	0.0002
D(GDP(-2))	-0.430101	0.217575	-1.976793	0.0636
D(GDP(-3))	0.605275	0.252687	2.395354	0.0277
D(CP)	0.857059	0.298042	2.875628	0.0101
D(CP(-1))	-1.124710	0.431295	-2.607752	0.0178
D(CP(-3))	-0.949608	0.408409	-2.325140	0.0320
D(FS)	17.32749	12.72871	1.361292	0.1902
D(FS(-2))	-29.10056	13.23324	-2.199050	0.0412
D(LS)	20.24895	7.883534	2.568512	0.0193
D(LS(-1))	-19.73060	9.717363	-2.030448	0.0574
D(FR(-1))	-68.99077	32.30681	-2.135487	0.0467
D(FR(-3))	-72.84127	36.81263	-1.978703	0.0634
ECM(-1)	-0.404211	0.150672	-2.682723	0.0152
R-squared	0.857139	Mean dependent var		1692.249
Adjusted R-squared	0.753962	S.D. dependent var		1470.532
S.E. of regression	729.4165	Akaike info criterion		16.32200
Sum squared resid	9576872.	Schwarz criterion		16.96326
Log likelihood	-247.1520	Hannan-Quinn criter.		16.53456
F-statistic	8.307452	Durbin-Watson stat		2.157281
Prob(F-statistic)	0.000037			

Source: Computed Result Using (E-View 8.1)

The Parsimonious Error Correction Model (ECM) in table 4.5 above shows that the dynamic model is a good fit. This is due to the fact that the variation in the dependent variable accounts for 86 percent of the total variation of the independent variables in the model. Specifically, the R^2 value of 0.857 indicated that the variation in GDP explained by crop production (CP), Livestock (LS), Fishing (FS) and forestry is 86 percent. Hence, the explanatory power of the model estimated is 86 percent. The goodness of fit of the model is further expressed by the value of F-statistics at 8.30 which is statistically significant at 5% level. This implied that the overall regression result is significant. The Durbin Watson (DW) value of 2.1 which is approximately 2.0, indicates a lesser level of autocorrelation. Meaning that the successive values of the error term are serially dependent or correlated

Furthermore, the coefficient of crop production (CP) is positively signed and statistically significant at 5 percent level with GDP which means that a percentage increase in crop production will increase the GDP by 0.857%. Also, the result showed that crop production (CP) has a significant effect on GDP. Therefore, the study accepts the alternative hypothesis which states that 'there is a significant relationship between crop production (CP) and GDP in Nigeria.' The coefficient of fishing (FS) is positively signed but statistically not significant at 5 percent level with GDP. Meaning that a percentage increase in fishing will increase GDP by 17.33%. The implication of the statistically not significance of fishing with GDP is that fishing (FS) does not have effect on GDP in Nigeria during the period of study. Therefore the study accepts the null hypothesis which states that 'there is no significant relationship between fishing and GDP in Nigeria.

Furthermore, the coefficient of livestock (LS) is positively signed and statistically significant at 5 percent level with GDP. This means that a percentage increase in livestock production will increase the GDP by 20.25%. The implication of the statistically significance of livestock with GDP is that livestock had effect on GDP in Nigeria during the period of study. Hence the study accepts the alternative hypothesis which says 'there is significant relationship between livestock and GDP in Nigeria'. The coefficient of forestry (FR) is negatively signed but statistically significant at 5 percent at level with GDP. This means that a percentage increase in forestry will decrease GDP by 68.99%. Implying that forestry has effect on GDP in Nigeria during the period of study. Therefore the study accepts the alternative hypothesis which says 'there is a significant relationship between forestry and GDP in Nigeria.'

Conclusion and Recommendation

Conclusion

This study is on the effect of agricultural output on economic growth of Nigeria (1981-2016). It study empirically examined the effect and contribution of agricultural output to economic growth in Nigeria. And the need to harness the abundance of agricultural resources and potentials the country is endowed with for optimum growth and development of the economy. The objectives of the study were to; examine the effect of agricultural output, crop production, livestock production, fishery production and forestry on economic growth in Nigeria. Based on these objectives, an empirical model that links agricultural output to economic growth was specified and estimated using ordinary least square regression analysis and complemented with multivariate Johansen co-integration test. Meanwhile, Error Correction Mechanism is the main technique of analysis. The secondary data on GDP, crop production, livestock, fishing and forestry used are yearly observations obtained from the Central Bank of Nigeria (CBN) statistical bulletin. The results of the unit root test showed that all the variables were stationary. Also there exists three co-integration equation amongst the variables in the model. The parsimonious Error Correction Model (ECM) indicated that with R^2 of 86%, the dynamic model is a good fit. The Durbin Watson (DW) value of 2.1 which is approximately 2.0, suggests a lesser level of auto-correlation. Meaning that the successive values of the error term are serially dependent or correlated.

Moreover, the coefficient of crop production is positive and statistically significant at 5 percent level with GDP. Meaning that a percentage increase in crop production will increase the GDP at 0.857%. The coefficient of fishing (FS) is positively signed but statistically not significant at 5 percent level with GDP. Meaning that a percentage increase in fishing will increase the GDP by 17.33%. Also the coefficient of livestock (LS) is positively signed and statistically significant at 5 percent level with GDP. This means that a percentage increase in livestock production will increase the GDP by 20.25%. The coefficient of forestry (FR) is negatively signed and statistically significant at 5 percent level with GDP which means that a percentage increase in forestry will decrease the GDP by 68.99%. Thus, it could be concluded that a well harnessed agricultural output or production will lead to optimum growth and development of the economy. Therefore, Nigeria government must look beyond crude oil and pay better attention to agricultural production to engender growth and development of the economy.

Recommendations

Based on the findings from the study, the following recommendations were made;

1. Nigerian government should put good structures in place that allows better and higher agricultural output. Agricultural products should not be allowed to waste but should be channeled into manufacturing industry as raw materials for production of other consumer products for revenue and foreign exchange earnings.
2. The various state government should look beyond the monthly federation allocation account (FAAC) as their major source of revenue for developmental projects but work towards utilization and exploitation of fallow lands in their states for farming that translates into employments, improved standard of living, revenue earnings and economic growth in general.
3. Agricultural institutions should be revived, revamped and some privatized with proper supervision for better productivity. Various agricultural policies and schemes should be reviewed and strengthened for effective implementations.
4. Long term agricultural development plans/projects that are realistic should be created and executed. There should be continuity of projects, policies and schemes which are created and implemented to outlive each government tenure.
5. Nigeria government should increase budgetary allocation to the agricultural sector and ensure effective utilization of the funds/budgets that translates into improved and increased output annually.
6. There should be availability and Subsidization of agricultural inputs for farmers.
7. Nigerian government should create secured and enabling environment for commercial farming which will encourage both local and foreign investors to invest in agriculture in the country. There should be workable and lasting solution towards resolution of crisis between farmers and herders.

References

Aigbokha, B. (2001). *Resuscitating agricultural production (Cocoa, Cotton, Groundnut, Palm Oil, Rubber, Etc.) For Export*. CBN proceedings of the 10th Annual Conference of the Zonal Research Unit, *Ibadan,*

Anriquez, G. & Stamoulis, K. (2007). *Rural development and poverty reduction: Is agriculture still the key?* ESA working paper No. 07-02. FAO, Rome.

Arokoyo, T. (2012). *Challenges of integrating small scale farmers into the agricultural value chains in Nigeria.* Being A Lead Paper Presented At The 2012 Edition of the Annual National Agricultural Show Tagged Promoting Sustainable Investment in Agriculture in Nigeria. (Unpublished).

Bekun, F. V. (2015). *The contribution of agricultural sector on the economic growth of Nigeria (1981-2013).* A Research paper submitted to Institute of Graduate Studies, Eastern Mediterranean University, Gazimagusa, North Cyprus.

Block, S. & Timmer, C.P. (1994). *Agriculture and economic growth: Conceptual issues and the Kenyan experience.* HIID Development Discussion Paper No. 498. Harvard Institute for International Development, USA: London.

Essays, U. K. (2013). *Role of agriculture to economic growth and development*. Economic essay. Retrieved from https://ukessays.com/essays/economics/role-of-agriculture-to-economic-growth-and-development-economics-essay.php? Cref =1

Johnson, B. & Meller, J. (1961). The role of agriculture in economic development. In: American *Economic Reviews, 51* (4), 566-593.

Noko, E. J. (2015). *Impact of agricultural sector on Nigeria economic growth and development* (1981-2015). Retrieved from http://educainfo.com/agricultural-sector-nigeria-economic-growth/ February 10, 2018.

Okoro, O. A. (2011). *The contribution of agricultural sector in the Nigerian Economy between 1986 and 2007*. A Research Paper.

Oyinbo, O. & Rekwot, G. Z. (2014). Agricultural production & economic growth in Nigeria: Implication for rural poverty alleviation. Ahmed Bello University, Zaria, Nigeria. *Quarterly Journal of International Agriculture 53*, (3).

Pooyth, D., Hassan, R., Kirsten, T. F. & Calcaterra, M. (2001). *Is agriculture sector growth a Pre-condition of economic growth? The case of South Africa.* Working paper 2001-01, department of agricultural economics, extension and rural development, university of Preforia, Pretoria, 0002. South Africa.

UNDP (2012). *Africa human development report: Toward a food secure future*, New York: London.

Yusuf, S. A. (2014). *Role of agriculture in economic growth & development: Nigeria Perspective: A M.Sc*. Lagos: Thesis Submitted to Economics Department, University of Lagos, Nigeria.