THE IMPACT OF AGRICULTURAL EXPENDITURE ON AGRICULTURAL OUTPUT IN NIGERIA

Falana, Olatunbosun Ayo[1*]

[1]Ekiti State University, Ado-Ekiti, Nigeria

*corresponding author: ayo.falana@nmbc.gov.ng

ABSTRACT

Agriculture contributes immensely to the economic development in Nigeria, efficient and effective management of the sector will enable the country to feed its increasing population, provide job opportunities, foreign exchange earnings and the provision of raw materials for the industries. However, due to policy and agriculture expenditure inconsistency coupled with political instability the sector has not been performing up to its expectation. This study makes immense contribution to the existing arguments by empirically analysing the effect of government agriculture expenditure on agriculture growth in Nigeria, using time series data from 1961-2013 obtained from the Central bank of Nigeria. Granger causality technique of data analysis was used in testing the secondary data. Agriculture gross domestic product (AGDP) was used as a proxy for agriculture growth, while government expenditure on agriculture was used as indicators of government expenditure on agriculture (GAEXP). The result of this study shows bidirectional causality between Government agriculture expenditure and agriculture GDP in Nigeria at the fourth lag lengths between 1961 and 2013. In other words agriculture expenditure granger causes agriculture GDP and also agriculture GDP granger causes agriculture expenditure. The study therefore recommends an urgent attention to be given to consistent budgetary allocation towards agricultural sector. The study also suggest, that government expenditure on agriculture sector should be continuous and not only in the time of falling agriculture product. This will continuously increase agriculture output and growth as well.

Keywords: Agricultural Expenditure, Agricultural Output, National Economic Empowerments Strategy (NEEDS)

INTRODUCTION

Agriculture constitutes one of the most significant sectors of the Nigerian economy (Manyong et al., 2005). It was the agricultural produce of Nigeria that drew the attention of the colonial masters in the 19th century. Ekpo and Egwaikhide (1994), revealed that the export of agricultural products in Nigeria accounted for over 75% of total exports in 1960.

Nigeria was known for her rich agricultural product and the wide range of climate variations allows for the production of a variety of food and cash crops. The food crops include cassava, yam, corn, coco-yam, cow-peas, beans, sweet potatoes, millet, plantain, banana, rice, sorghum, and a variety of fruits and vegetables. The leading cash crops are cocoa, citrus, cotton, groundnuts (peanuts), palm oil, palm kernel and rubber. They were also Nigeria's major exports in the 1960s and early 1970s until petroleum surpassed them in the 1970s. Among the export destinations for Nigerian agricultural product exports are United Kingdom, Canada, US, Germany and France.

The fall in agricultural production in Nigeria started with the era of the petroleum boom in the early 1970s. The boom in the oil sector resulted in a distortion of the labour market. The distortion led to adverse effects on the production levels of both food and cash crops. Governments had paid farmers low prices during the oil boom period on food for the domestic market in order to satisfy urban demands for cheap basic food products. The outcome of this policy progressively made agriculture less attractive and enhanced the lure of white collar job and the love of cities for potential farmers. Collectively, these developments worsened the low productivity, both per unit of land and per worker, due to several factors such as inadequate technology, acts of nature such as drought, poor transportation and infrastructure, and trade restrictions.

Forest (1995), discovered that during the oil boom period (1971-1977), average GDP growth rates of the agricultural sector fell to -2.6 per cent and the annual growth rate for food production decline to -5.6 per cent. Agriculture's share of GDP which averaged 60 per cent during the 1960s, declined to about 30 per cent. This is the lowest average level between 1978 and 1981. The sector's contribution to total employment also declined from 75 per cent to 59 per cent between 1970 and 1982, while export shares declined from 70 per cent in 1970 to less than 3 per cent in 1982.

According to Olaoye et al. (2010), agricultural growth and sustainability can only be achieved by consistent schemes, availability of finance, agricultural mechanization policy and enabling environments. The development of agricultural sector in any nation is one of the crucial requirements for moving the economy forward (Tombofa, 2004). In many developed countries, agricultural sustainability and growth depend largely on how much the government has to spend on agriculture sector

As a result of the oil boom in Nigeria, the oil sector   became the major determinant of Nigeria's economic growth, accounting for over 90 per cent of externally generated revenue and about 80 per cent of the entire government's revenue in 1974 (Colman and Okone, 1998). Since the beginning of this oil boom, agriculture sector began to experience decline in output with cash crop production stagnating

with overall decrease in export volume from 75 per cent to 56 per cent within the period and the shortage of food production became an issue of importance. (Adunbi et al., 1999).

All these attests to the fact that excessive government spending on the agriculture sector over the period did not have any significant impact on agriculture contribution to GDP. Therefore, the objective of this study is to ascertain the effect of government agriculture expenditure on the growth of agriculture sector in Nigeria.

REVIEW OF RELATED LITERATURE

Agriculture development in Nigeria

In the 1960s before the oil boom, agriculture sector constituted more than 75% of the total foreign exchange earnings and job opportunities for the Nigerian citizens was about 65% of the gross domestic product (GDP). The sector also accounted for about 50% of the national revenue (FRN, 2000). However, after the independence in the 1960, the role and contribution of agriculture sector in the country began to diminish. The decline was due to the discovery of oil in large quantity and the dominance of the crude oil sector in the national economy. The sectorial contribution of agriculture to overall economic growth was about 50 per cent in 1970 and 34 per cent in 2003 (Central Bank of Nigeria 2003). As at 2011, agriculture accounted for 40.2 per cent of the GDP.

Even though agriculture sector no longer accounts for about 50 per cent of the national gross domestic product (GDP) and in foreign exchange earnings due to phenomenal growth in the petroleum sector of the economy, agricultural sector is still dominating the centre of economic activity in terms of job opportunities and linkages with the rest of the sector within the Nigeria economy (Nigerian National Planning Commission, 2004). Chigbu (2000), stated that, despite the fact that agriculture accounts for one-third of GDP, it still remains the only sector in the Nigerian economy that employs majority of Nigerian populace.

The major problem that hinders the growth of Nigerian agricultural sector is the lack of favourable conditions for full integration of agricultural mechanization. The sector is still structured with the traditional method of production which has remained the same since independence (Ukeje, 2005). According to the National Planning Commission, (2004) the United Nations Food and Agriculture Organization rates agriculture productivity in Nigeria as low to medium but with medium to good productivity if the sector is efficiently managed. To be effective and attain higher level of productivity and growth in the agricultural sector there is a need to identify the major factors that determine its growth.

Agriculture policies and expenditure in Nigeria

According to Dye (1972), a policy is the actions and inaction of the government. Policy can also be seen as a set of simultaneous decisions embarked upon by the leaders concerning the selection of goals and the means of achieving them within a specified situation where those decisions should, in principle be within the power of those leaders to achieve (Jenkins, 1978).

Agricultural policies become more important in Nigeria after the discovery of oil in the 1960s. Prior to this time, agriculture had been the main stay of the economy and it accounted for over 75% of total exports in 1960 (Ekpo and Egwaikhide, 1994).

National Economic Empowerment and Development Strategy (NEEDS)

Although petroleum takes a significant percentage of Nigerian Economy, and a source of foreign exchange earnings, the fact still remain that agriculture is the mainstay of the Nigerian economy because it is the largest non-oil employer of the Nigerian population. However, since the discovery of oil in Nigeria in large quantity, all effort to revamp the declining agricultural sector proved abortive, to meet food demand in Nigeria resulted in gradual increase in importation of food items and raw materials for industries which eventually leads to unemployment especially in the rural areas because agriculture as the major source of foreign exchange has been underrated. The forth republic in Nigeria commence in 1999, agriculture sector was made a priority with total budgetary allocation of ₦59.3 billion   and the enactment of the National Economic Empowerment and development strategy (NEEDS) in 2002. The policy was replicated as State Economic Empowerment Development Strategy (SEEDS) and Local Economic Empowerment Development Strategy (LEEDS) in the state and local government level respectively.

The policy took effect in 2004 to pursue agricultural development vigorously with the primary aim of capturing food security and constraints that hinders the growth and development of the Agriculture sector such as, inadequate agricultural extension services, the lack of indigenous capacity or technologies responsive to local conditions and inadequate processing and storage facilities as well as inefficiencies input supply and distribution, complete dependence on rain-fed agriculture, absence of economies of scale with poor land tenure system that inhibits the acquisition of land for mechanized farming as well as policy inconsistency, and the decline in political commitment to agricultural and rural development.(National planning commission, 2004).

Objectives of NEEDS Agriculture programmes

According to the national planning commission (2004) NEEDS policy objective shall include the following:

- Provision of right policy environment and target incentives for private investment in the sector.

- Implement a new agricultural and rural development policy aimed at addressing the constraints in the sector

- To foster effective linkages with industry to achieve maximum value-added and processing for export with modernize production and to create an agricultural sector that is responsive to the demands and realities of the Nigerian economy in order to create more agricultural and rural employment opportunities, which will increase the income of farmers and rural dwellers.

- The policy also seeks to reverse the trend in the importation of food items (which stood at 14.5 per cent of total imports at the end of 2001), through a progressive programme for agricultural expansion. The government is committed to reducing the growing food import bill to stem the rising trade imbalance as well as diversify the foreign exchange earnings by increasing cash crop production that could be exported and improving the quality of the environment in order to increase productivity.

According to food and agricultural organization of the United Nations, FAO (2008) reported that the trend of agriculture expenditure in Nigeria has been an average of 4.7 per cent for   the period of 11 year from 1970-1980. In another 11 years interval between 1980-2000, agricultural sector allocation increases to 7.00 per cent and 10 per cent from 2000-2007, despite the increase in agriculture expenditure the rate of growth in the sector is not in commensuration with the expenditure, FOA suggested the need for government to increase government capital budgetary allocation to agricultural sector to 25 per cent which was implemented in 2008 with ₦65,399.01 billion but in the subsequent year, agricultural expenditure does not follow the same pattern as ₦22,435.2 and ₦28,217.95 billion was allocated to agriculture sector in 2009 and 2010 respectively, this figure does not reflect the 25 per cent of national budget as suggested by FOA in 2008

NEEDS agriculture policy target and strategy

To restore agriculture to its former status as the leading sector in the economy, NEEDS sets the following targets: To achieve minimum annual growth rate of 6 per cent in agriculture, raise agricultural exports to $3 billion by 2007 with major

component of these exports to be cassava and drastically reduce food imports, from 14.5 per cent of total imports to 5 per cent by 2007. Under the NEEDS initiative, Nigeria hopes to generate as much as 3 billion naira a year from agricultural exports, by taking advantage of the various concessional arrangements provided by the European Union's African, Caribbean, and Pacific states agreement, the U.S. African Growth and Opportunity Act, and the National Partnership for African Development, as well as the huge West African market and World Trade Organization (WTO), Strengthen agricultural research, revitalize agricultural training, and streamline the extension delivery system. Involve NGOs and opinion leaders in extension delivery by building capacity and promoting improved technologies that meet farmers' needs. Review the agricultural input supply and distribution system with a view to developing an effective and sustainable private sector led input supply and distribution system and Promote integrated rural development involving agricultural and non-agricultural activities, through the provision of physical infrastructure such as feeder roads, rural water supply, and rural communications. NEEDS also strategized to encourage states to develop model rural communities and farm settlements, providing them with feeder roads, boreholes, vocational training, simple farm tools and equipment, alternative energy sources, and communications canters to provide a wholesome rural life and reduce the incentives to migrate to urban areas.

Most importantly, NEEDS sought to adequately capitalize the Nigerian Agricultural, Cooperative and Rural Development Bank (NACRDB) to provide soft agricultural credit and rural finance. (NACRDB) was restructured and mandated to expand and include full financial intermediation (National Planning Commission, 2004).

Agriculture programmes in Nigeria

There are several agricultural program launched in Nigeria to enhance the better life of their citizen and promote the economic growth of the country by harnessing cross boarding business and ideas BETWEEN Nigeria and other countries in the world for example:

Small and Medium Enterprises Equity Investment Scheme (SMEEIS), 2001. This is a voluntary initiative of the Bankers' Committee to support micro, small and medium enterprises (SMEs), including agro and agro-allied businesses. Financing is in form of either debt or equity. In the case of debt, the borrowing rate is not to exceed single digit. This is introduced to encourage small and medium scale agricultural business through commercial farming

Large Scale Agricultural Credit Scheme (LASACS), 2009. This is a ₦ 200 billion fund

programme established by the Federal Government in the wake of the current global economic crisis to finance large integrated commercial farm projects with an asset base of at least N350 million (excluding land) with prospects of increasing to N500 million in three years' time, and medium-sized agricultural enterprises with an asset base of ₦200 million (CBN, 2009). The terms of borrowing are favourable, including a long tenor and single digit lending rate. Agricultural Development Programmes (ADP) has recently been working in conjunction with the National Programme for Food Security (NPFS) in the provision of credit to farmers. Small and Medium Enterprises Equity Investment Scheme (SMEEIS), 2001. This is a voluntary initiative of the Bankers' Committee to support micro, small and medium enterprises (SMEs), including agro and agro-allied businesses.

THEORETICAL LITERATURE

Economic growth has been considered and analysed from various theoretical perspectives. These growth models include: the classical economic growth model by Malthus, Harrod Domar growth model, and Keynesian growth model.

Neoclassic Theory

The neoclassical economist had shed more light on how a nation can improve its economic growth; this can be in the form of innovations and technologies or through the course of competition. According to Solow (1956), economic growth according to the neoclassical economist can be achieved by increasing investment levels. This indicates that for undeveloped countries to grow economically, it is imperative to set up economic policies that will encourage and support greater investment.

Keynesian Theory

Keynesian economics growth model opined that for growth to take place in an economy, there must be government interventions. The more government intervene with macro-economic policies and expenditure, the faster the growth of the economy. Todaro and Smith (2003) examined Lewis theory of development and they reported that less developed economies is usually made up of two sectors, these sectors are the primitive agricultural sector which is characterized by peasant farming and by zero marginal productivity of labour and the modern industrial sector.

Johnston and Mellor (1961),stated that agriculture contributes to economic growth and development through five inter-sectorial linkages, the sectors are linked through the following: (a) supply of food for domestic consumption (b) provision of market for industrial output (c) supply of surplus labour to firm in the industrial sector (d) supply of domestic savings and industrial investment and (e) supply of foreign exchange from agriculture export earnings to finance import of intermediate and

capital goods.

Agriculture sector contributed immensely to the overall development of an economy in four major ways: product contribution, factor contribution, market contribution and foreign exchange contribution (Kuznets 1961; Mackie 1964; Abayomi 1997; Abdullah 2002; World Bank 2007).

EMPIRICAL LITERATURE

According to Akande (2003), government expenditure and budgeting is important to national economic development. National budgets play a prominent role in modern economic management because budgeting system are used for allocating resources and planning as well as forecasting revenue inflow and expenditure.

Many studies have attempted to link government spending to agricultural growth and poverty reduction (Elias, 1985; Fan et al., 2000; Fan et al., 2004; Fan and Pardey, 1998, and Lopez, 2005). They concluded that government spending contributed to agricultural sector production and development in the long run but different types of government expenditure may have differential effects on agriculture growth.

Samuel et al. (2009), stated that, agricultural productivity returns responds to different types of public expenditure across various agro-ecological zones in Ghana and that formal education has a negative relationship with agricultural productivity. The result of the study also found that provision of various public goods and services like, education, health and rural roads had substantial impact on agricultural productivity.

Geetha et al. (2014), examine the effects of agricultural research expenditure and climate change on agricultural productivity growth by region in Ghana. Data was collected through the use of questionnaire The results specify that significant causal factors impact positively on Ghana's agricultural productivity growth, which include climate variability, infrastructure, and agricultural research and development expenditure.

Alexander, et al. (2012).In Zimbabwe, empirical analysis reveals strong evidence pointing to the fact that agriculture sector is the engine of growth to their economy .Primary data was adopted in the course of the research The results from their study indicated that government expenditure on agricultural research and development would increase agricultural output and reduce poverty.

Alexander et al. (2012), investigated how Zimbabwe's government expenditure on

agricultural sector affects the GDP growth in the country. A linear regression model was employed between 1980 and 2009 and the results of the empirical analysis reveal a strong evidence indicating that agriculture was an engine of economic growth. The study later concludes that poor agricultural credit facilities and inadequate government expenditure on research and development affect agricultural productivity in the country

Gap in Literature

Several studies have been carried out in the past on this subject. But the review of previous empirical literature revealed a lack of consensus in the research findings of past researchers which indicates the existence of a research gap.

This study is distinct from previous works because this study above reveals that there exist varying factors that affect agriculture output in Nigeria and in the world at large, factors identified includes: government agriculture expenditure, technology, agricultural research and development, enabling environment and infrastructure among others. One very common factor with all these studies is the fact that government budgetary allocation to the sector will go a long way in improving the growth of agriculture sector and the economy as a whole.

METHODOLOGY

Ex-post facto research design which was explored in this research study, relevant data regarding the variables under-study were extracted through secondary data from the Bank of Agriculture in Nigeria for a period of 10years (2010-2010).Data were analyzed using Unit Root Test, Cointegration Test and Vector Error Correction Model with the aid of purpose sampling method .To achieve the objective of this paper, two variables were identified and discussed in this section. These are: dependent variable which is represented by agricultural output , Independent variable of Agricultural expenditure proxied by agricultural capital expenditure, agricultural recurrent expenditure and growth rate

Model Specification

The following mathematical model was developed to analyse the relationship between agricultural expenditure and agricultural output in Nigeria using their financial annual report

$AGRO = \beta_0 + \beta_1 ACE + \beta_2 ARE + \beta_3 AGR + \varepsilon$

  Where:

AGRO=Agricultural Output

ACE=Agricultural Capital Expenditure

ARE=Agricultural Recurrent Expenditure

ATE=Agricultural Growth Rate

ε =Error term

Table 3.1: Patterns of Government Agriculture Expenditure and Output In Millions of Naira (2005-2020)

YEAR	AGRICULTURAL CAPITAL EXPENDITURE	AGRICULTURE RECURRENT EXPENDITURE	GDP GROWTH RATE	AGRICULTURE EXPENDITURE GROWTH RATE
2005	2576.4	1.92	51%	65%
2006	3033.7	3.85	18%	100%
2007	3092.7	8.88	2%	131%
2008	3261.2	10.74	5%	21%
2009	4377.9	13.76	34%	28%
2010	5872.92	22.42	34%	63%
2011	6121.96	11.70	4%	-48%
2012	7401.64	29.38	21%	151%
2013	8033.55	8.68	9%	-70%
2014	9213.14	9.14	15%	5%
2015	10011.46	17.13	9%	87%
2016	13580.32	13.02	36%	-24%
2017	15905.5	14.79	17%	14%
2018	18837.19	12.76	18%	-14%
2019	23799.43	15.66	26%	23%
2020	26625.21	20.36	12%	30%

Source: Central Bank of Nigeria Annual Bulletin 2020

The following programmes also came to being in support of increasing agriculture production: Operation Feed the Nation Campaign (OFN) between 1976 and 1979 with annual recurrent agriculture expenditure of ₦11.70989 in 1976, ₦29.38492 in 1977 and ₦9.147768 million naira in 1979 (see table3.1) above.

Table 3.2 Pattern of Government Expenditure during the (NEEDS) Agricultural Policy

In Millions (1999-2013)

YEAR	AGRICULTURAL CAPITAL EXPENDITURE	AGRICULTURE RECURRENT EXPENDITURE	GDP GROWTH RATE	AGRICULTURE EXPENDITURE GROWTH RATE
2006	1127693.12	59316.1	7%	1951%
2007	1192910	6335.7	6%	-89%
2008	1594895.53	7064.5	34%	12%
2009	3357062.94	9993.5	110%	41%
2010	3624579.49	7537.3	8%	-25%
2011	3903758.69	11256.6	8%	49%
2012	4773198.38	16325.9	22%	45%
2013	5940236.97	17919.	24%	10%
2014	6757867.73	32484.2	14%	81%
2015	7981397.321	65399.	18%	101%
2016	9186306.051	22435.1	15%	-66%
2017	10310655.64	28217.9	12%	26%
2018	11590120.18	41169.8	12%	46%
2019	13413800	33300	16%	-19%
2020	14709100	39400	10%	18%

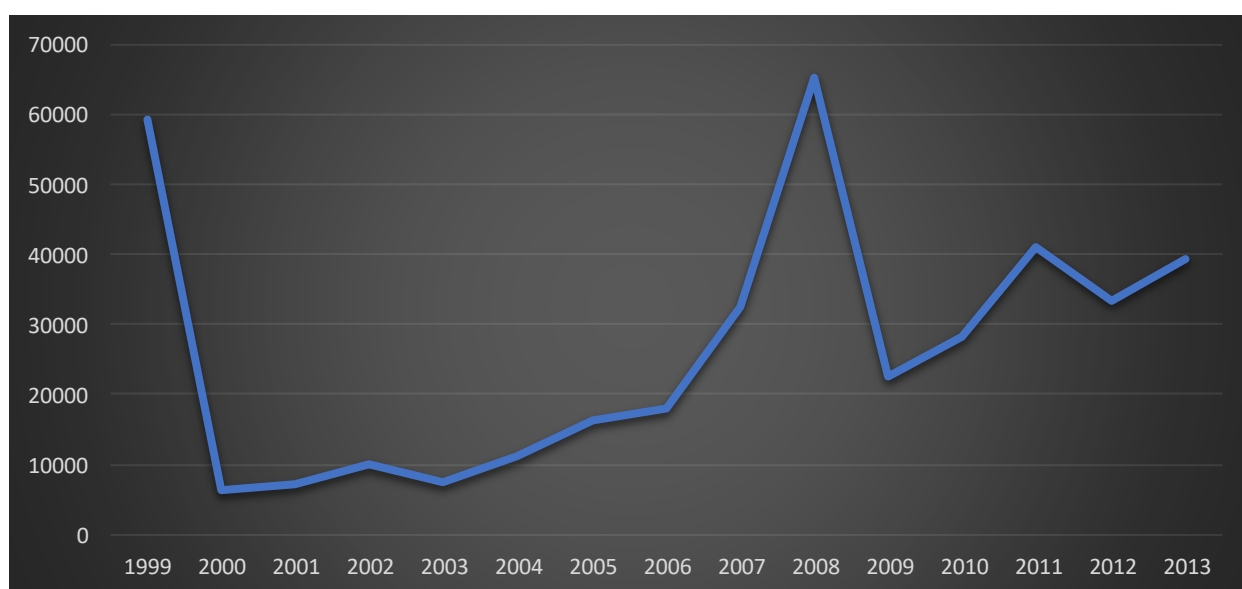Source: Central Bank of Nigeria Annual Bulletin, 2020.

Fig 3.1 Trend of Millennium Agricultural Expenditure in Nigeria

Source: Central Bank of Nigeria Annual Bulletin 2020

The millennium agriculture expenditure in Nigeria did not follow the same pattern. In

1999 total agriculture expenditure amounted to ₦59,316.17 billion, which dropped sharply to ₦6,335.779 billion and ₦7,064.546 billion in 2001 and 2005 respectively (see fig 3.1). Iganiga, (2011)   stated that, less than 2 per cent of total government expenditure was allotted to agriculture between 2001 and 2005, far lower than spending in other key sectors such as education, health, and water.
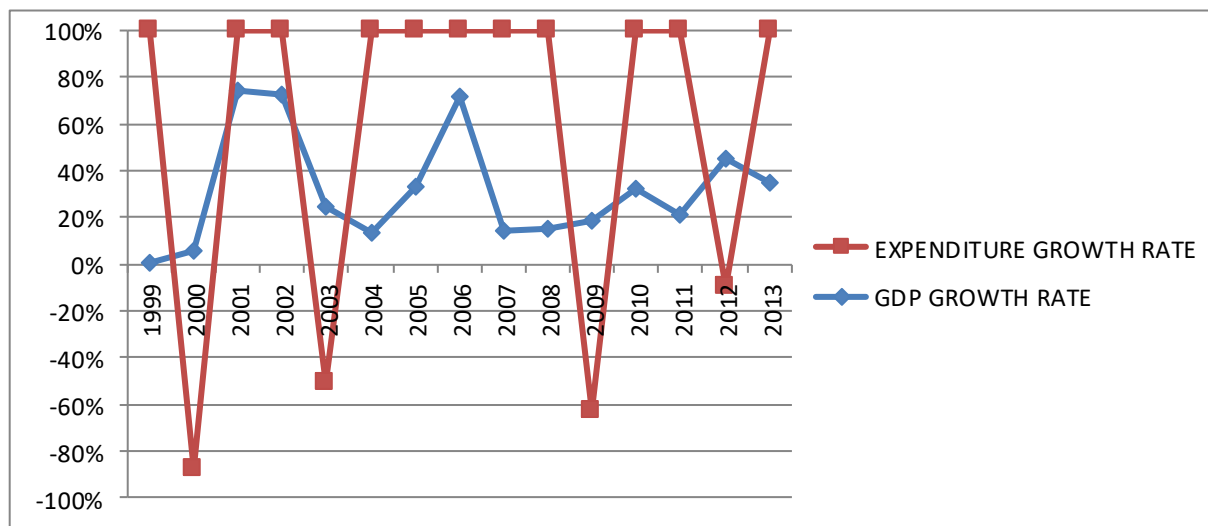

Fig 3.2 Growth Rate of Agriculture Expenditure and Agriculture Output in Nigeria (1999-2013).

From the figure above, it is obvious that agriculture expenditure is not stationary i:e the growth rate of agriculture expenditure is not consistent, the problem of agriculture expenditure inconsistency contributed to the slow planning and programme implementation between 1999 and 2013. Agriculture expenditure was only consistent between 2004 and 2008 because 2004 was the beginning of the first phase of NEEDS agriculture programme and 2008 mark the second phase of the programme. In 2009 National Food Security Programme was established but it was not implemented as a result of the death of President Musa Yar' dua.   The result of this led to the fallen in agriculture expenditure growth rate from 101 per cent in 2008 to -66 per cent in 2009. In 2011, Agriculture Transformation Agenda programme was established with the total expenditure of ₦41169.8 billion in the same year (see fig 3.2).

SUMMARY

The effects of agriculture expenditure on agriculture sector can be seen as unsatisfactory in view of its minimal effect on agriculture output in Nigeria. Although the situation is getting better in the current democratic regime that commence in 1999 compared to the exacerbated performance of the sector during the various military regimes between 1970 and 1998. From the context of the recent growth rate of agriculture sector in the country, genuine democracy and good governance with consistent agriculture budgetary allocation can guarantee agriculture growth, and can enhanced food security.

PRESENTATION OF RESULTS

Test of Stationary

Macroeconomic time series data are generally characterized by stochastic trends which could amount to spurious regression. Hence, it is a normal practice in such estimation to start by investigating the time series properties of each of the variables in the model. However, stochastic trends can be removed by differencing, though that could amount to loss of long-run information. Thus, this study applied the Augmented Dickey-Fuller (ADF) Techniques to test and verify the unit root property of the series and stationarity of the model. The ADF test involves the estimation of "δ" in the specification below:

$$\Delta y_t = \beta + \delta y_{t-1} + \sum \beta_i \Delta y_{t-1} + e_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots$$

The null hypothesis of ADF is d= 0 against the alternative hypothesis of d < 0. Non-rejection of the null hypothesis implies that the time series is non-stationary whereas rejection means the time series is stationary.

Table 4.1: Augmented Dickey-Fuller (ADF) Unit Root Test for variables under study

Null Hypothesis: LNAGDP has a unit root			
Exogenous: Constant			
Lag Length: 1 (Automatic - based on SIC, maxlag=10)			
		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.625388	0.9891
Test critical values:	1% level	-3.565430	
	5% level	-2.919952	
	10% level	-2.597905	
*MacKinnon (1996) one-sided p-values.			

Null Hypothesis: LNGAEXP has a unit root	

			t-Statistic	Prob.*
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-1.014482	0.7414
Test critical values:	1% level		-3.565430	
	5% level		-2.919952	
	10% level		-2.597905	
*MacKinnon (1996) one-sided p-values.				

The results from Table 4.1 indicate that the p-value of Agricultural GDP and Government agricultural expenditure are more than 0.05 indicating non-stationarity at level. Since they are not stationary at level, it suffices to check for stationarity after first difference.

Table 4.2: **Augmented Dickey-Fuller (ADF) Unit Root Test after first difference**

			t-Statistic	Prob.*
Null Hypothesis: D(LNAGDP) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.661049	0.0004
Test critical values:	1% level		-3.565430	
	5% level		-2.919952	
	10% level		-2.597905	
*MacKinnon (1996) one-sided p-values.				

			t-Statistic	Prob.*
Null Hypothesis: D(LNGAEXP) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=10)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-11.00862	0.0000
Test critical values:	1% level		-3.565430	
	5% level		-2.919952	
	10% level		-2.597905	

The results above shows the ADF test for stationarity after differencing the two variables. The ADF test the null hypothesis of non-stationarity as reported from the table above. The p-values for both Agriculture GDP and Agricultural government expenditure were found to be less than the 00.5 level of significance implying that, government expenditure and agricultural GDP are integrated of order one (I(1)).

Table 4.1 and 4.2 reveal that both variables are non-stationary at level but are stationary at their first-difference. In short, both variables are integrated of order one (that is they are I (1) processes) which sets the stage for co-integration.

Table 4.3 Co-integration test for the AGDP and GAEXP

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.307774	19.01352	15.49471	0.0141
At most 1	0.004959	0.253538	3.841466	0.6146
Trace test indicates 1 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Co-integration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.307774	18.75998	14.26460	0.0091
At most 1	0.004959	0.253538	3.841466	0.6146
Max-eigenvalue test indicates 1 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 4.3 gives results for co-integration and can be concluded that there exists co-integration between the variables involved. The p-value above is less than 5% level of significance and can be concluded that there exists a long-run relation between agriculture GDP and government expenditure on agriculture sector.

From this equation we retrieved the residual and performed ADF test and confirm that it is integrated of order zero (that is I (0)) as reported in the appendix and used

it to estimate the vector error correction model (VECM). The table below reports the results of VECM.

Vector Error Correction Estimates

Vector Error Correction Estimates		
Date: 08/2/21 Time: 16:02		
Sample (adjusted): 1964 2013		
Included observations: 50 after adjustments		
Standard errors in ( ) & t-statistics in [ ]		
Co-integrating Eq:	CointEq1	
LNAGDP(-1)	1.000000	
LNGAEXP(-1)	-0.896048	
	(0.04002)	
	[-22.3917]	
C	-6.641392	
Error Correction:	D(LNAGDP)	D(LNGAEXP)
CointEq1	-0.047947	0.676133
	(0.04044)	(0.20992)
	[-1.18558]	[3.22088]
D(LNAGDP(-1))	0.463186	0.474778
	(0.13979)	(0.72562)
	[3.31336]	[0.65431]
D(LNAGDP(-2))	-0.078027	-0.250339
	(0.14155)	(0.73474)
	[-0.55123]	[-0.34072]
D(LNGAEXP(-1))	-0.074079	-0.093529
	(0.03128)	(0.16238)
	[-2.36803]	[-0.57599]
D(LNGAEXP(-2))	-0.066343	0.076293
	(0.02608)	(0.13540)
	[-2.54338]	[0.56349]
C	0.144828	0.141712
	(0.03435)	(0.17828)
	[4.21684]	[0.79491]

The estimated coefficients of the ECM term which is also the speed of adjustment to equilibrium is negative and statistically insignificant as reported in the above. The sign shows a long run relationship between the variables but the ECM term is insignificant and can be concluded that about 5% of the gap is closed each year. There is enough evidence that AGDP and GAEXP are co-integrated in this study. The speed of adjustment to equilibrium is 5% within a year when the variables wander away from their equilibrium values.

SUMMARY OF FINDINGS

The study examines the effect of government agricultural expenditure on agricultural growth in Nigeria using time series data from 1961-2013. Some econometric tools were employed to explore the relationship between these variables. The study examined each time series by testing their stationary using Augmented Dickey Fuller (ADF) test. The relationship between government expenditure on Agriculture (GAEXP) and Agricultural GDP (AGDP) was examined using Engel-Granger two stage modeling procedure and Pairwise Granger causality tests.

The finding shows that public agricultural expenditure in Nigeria affects agricultural output positively. The result from the co-integration test indicates that there exist long-run relationship between government expenditure on agriculture and agriculture contribution to GDP (output). In addition, the causality results reveal that up to three lag lengths at 5% level of significance, there was no causality between the variables. However, the fourth lag indicated a bidirectional causality and this could be attributed to the over dependence on government spending during election years.

The general trend, nature and results of this study seem to be consistent with the work done in Ghana by Geetha et al (2014), Zimbabwe by Alexanda et al (2012), Nigeria by Okezie et al (2013) and the work done by Abu and Abu (2003) in Egypt, Syria and Israel. Their result shows a positive relationship between agricultural GDP (AGDP) and government expenditure on agriculture (GEXP) as shown in this study. The difference lies in the direction of causality and the lag lengths. Unlike the works mentioned above, this study found a bidirectional causality between AGDP and GEXP at the fourth lag lengths with difference explained in the periods involved. It is evident therefore that, the low agriculture expenditure in Nigeria is responsible for the less than expected growth rate of the agriculture GDP.

CONCLUSION

This study sought to empirically investigate the relationship between government spending on agriculture and agriculture contribution to GDP using annual series data from 1961 to 2013. Some econometric tools were employed to explore the relationship between these variables by testing their stationarity using Augmented Dickey fuller (ADF) test. Furthermore, the relationship between government expenditure on agriculture and agricultural GDP is also examined using the Engel-Granger two step modeling and Pairwise Granger Causality test.

The findings from this study show that agriculture growth in Nigeria responds positively to government expenditure on the sector. Thus there exists a long run relationship between agriculture expenditure and agriculture GDP. In addition, the causality test reveals that at 5% level of significance, there was bidirectional causality between the variables involved at the fourth lag length. This could be attributed to the excessive pumping or spending made by successive governments during election periods.

This is a channel of economic growth and development through which government can reduce inflation, unemployment and poverty in the country. On the other hand, inadequate government agriculture expenditure and lack of agricultural mechanization policy will worsen agriculture growth. This fact is supported by the report published in 2004 by agriculture and natural resources team of the UK department for international development (DFID) in collaboration with Anne Thomson of Oxford policy management.

POLICY RECOMMENDATION

Sequel to the findings and careful investigation of the effect of government agricultural expenditure towards improving agricultural output in Nigeria it is therefore imperative for the government and its agencies in charge of economic growth to make the following macroeconomic policies;

- Urgent attention should be given to more budgetary allocation towards agricultural sector. It should be noted that government expenditure on the sector should be continuous and not only in times of falling agriculture product. This will help increase agricultural output and hence agricultural growth.

- Agriculture mechanization policy should be pursued in Nigeria. Efforts should be focused on encouraging commercial production by making funds available for evolvement of large scale and mechanized farming system. This will be the major provider of employment for the youth and rural poor and provide

support for small farmers to increase productivity to cope with downward pressure.

- Coupled with the above will be for government to involve some financial institution so that access to credit by farmers to acquire modern farming techniques and equipment will not be hampered. Irrigation facilities should also be made a priority to have all year-round production.

LIMITATIONS

The major limitation encountered by the study is the inadequate time involved in carrying out the research and the difficulty encountered in getting more recent time series data of agriculture GDP and Agriculture expenditure from the Central Bank of Nigeria (CBN) and the national bureau of statistic (NBS).

Lastly, the study is limited as a result of the distance and inability to visit Nigeria for update information during the period of the research.

REFERENCES

Olaoye, J. O., and Rotimi, A. O. (2010). Measurement of agricultural mechanization index and analysis of agricultural productivity of farm settlements Southwest Nigeria. *Agricultural Engineering International: CIGR Journal, 12*(1).

Tombofa, S. S. (2004). *Development Economics: An Introduction,* Port Harcourt.

Ekpo, A. H.,& Egwaikhide, F. O. (1994). Export and Economic Growth in Nigeria: A Reconsideration of the Evidence. *Journal of Economic Management, 1*(1), 100-115.

Anyanwu, J. C. A., Oyefusi, H., Oaikhenan, & Dimowo, F.A. (1997). *The Structure of the Nigerian Economy (1960-1997).* Anambra: Joanee Educational Publishers Ltd.

Fan, S., Zhang, X., & Rao, N. (2004). *Public expenditure, growth, and poverty reduction in rural Uganda (No. 4).* International Food Policy Research Institute (IFPRI).

Abayomi, Y. O. (1997). The agricultural sector in Nigeria: The way forward. CBN Bullion, 21, 14-25.

Iganiga, B. O. & Unemhilin, D. O. (2011). The impact of federal government agricultural expenditure on agricultural output in Nigeria. *Journal of Economics, 2*(2), 81-88.

World Bank (1997). *Rural development: From vision to action. A sector strategy paper.* Washington D.C. The World Bank.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 65-94.

Akinboyo, O. L. (2008). Five decades of agricultural policies: What role has statistics played. CBN Bullion, 32, 134-165.

Todaro, M. P., Smith, S. C., & Stephen, C. (2003). *Economic Development.* Pearson Education Limited.

Rostow, W. W. (1960). *The stages of growth: A non-communist manifesto*. Cambridge University Press.

Johnston, B. F., & Mellor, J. W. (1961). The role of agriculture in economic development. *The American Economic Review*, 566-593.

Timmer, C. P. (1995). Getting agriculture moving: do markets provide the right signals? *Food Policy, 20*(5), 455-472.

Federal Republic of Nigeria (2000). *Obasanjo's Economic Direction 1995-2003.* Office of the Honorable Minister for Economic Matters, Abuja, Nigeria.

CBN (2011). Central bank of Nigeria Annual report 2011.

Muhammad-Lawal, A., & Atte, O. A. (2006). An analysis of agricultural production in Nigeria. *African Journal of General Agriculture Vol, 2*(1).

Nigerian National Planning Commission. (2004). Meeting everyone's needs: National economic empowerment and development strategy. Abuja, Nigeria.

Central Bank of Nigeria (2003). *Statistical Bulletin.* Central Bank of Nigeria.

Manyong, V. M., Ikpi, A., Olayemi, J. K., Yusuf, S. A., Omonona, R., & Idachaba, F. S. (2003). *Agriculture in Nigeria: Identifying Opportunities for Increased Commercialization and Investment Report from International Institute of Tropical Agriculture and University of Ibadan.* USAID Nigeria.

Evbuomwan, G. O., Emmanuel, U. U., Moses, F. O., Amoo, B. A. G., Essien, E. A., Odey, L. I., & Abba, M. A. (2003). Agricultural Development: Issues of Sustainability. *Contemporary Economic Policy Issues in Nigeria,* 185-221.

Central Bank of Nigeria (CBN). *Annual Reports (1986 - 1992).* Lagos: Central Bank of Nigeria.

CBN (2013). Central bank of Nigeria Annual report 2013.

Akande, O. (2003). *Nigeria Macro Report, a Report to the Afrint Project.* Nigeria Institute for Social and Economic Research. Ibadan: (NISER).

CBN (1988). *Agricultural Credit Guarantee Scheme Funds (ACGSF), Agricultural Finance Dept., Annual Reports (1977 - 1988).* Lagos: Central Bank of Nigeria

Federal Ministry of Agriculture, Water Resources and Rural Development (2005) Perspective Plan for Agricultural Development in Nigeria. Volume 1, 1990-2005.

Ihugba, O. A., Chinedu, N., & Njoku, A. C. (2013). An assessment of Nigeria expenditure on the agricultural sector: Its relationship with agricultural output (1980-2011). *Journal of economics and international finance, 5*(5), 177.

Jiranyakul, K. & Brahmasrene, T. (2007). The relationship between government expenditures and economic growth in Thailand. *Journal of Economics and Economic Education Research, 8*(1), 93-102.

Feige, E. L., & Pearce, D. K. (1979). The casual causal relationship between money and income: Some caveats for time series analysis. *The Review of Economics and Statistics,* 521-533.

Thirtle, C., & Bottomley, P. (1989). The rate of return to public sector agricultural R&D in the UK, 1965–80. *Applied Economics, 21*(8), 1063-1086.