Effect of Agricultural Funding on Agricultural Output in Nigeria (1990-2020)

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Abstract

*This study examined the effect of agricultural funding on agricultural growth in Nigeria spanning from 1990-2020. The specific objectives were to determine the effect of public capital expenditure on agricultural output in Nigeria, determine the effect of public recurrent expenditure on agricultural output in Nigeria, determine the effect of agricultural credit guarantee scheme on agricultural output in Nigeria, and the effect of Foreign Agricultural Grant on agricultural output in Nigeria. This study adopted the quasi-experimental research design. Secondary data were used in this study. Data used were gotten mainly from the publications of Central Bank of Nigeria (CBN) namely; Statistical Bulletin. The method adopted for analyzing is the Augmented Dickey Fuller test (ADF). Pre-estimation diagnostics tests were employed to check for stationarity of the data to prevent spurious regression analysis. From the regression result, it could be seen that only agricultural credit guaranteed scheme fund (ACGSF) was significant in influencing agricultural output in the period under study (1990-2020) as the probability values of its t-statistics were less than 5%, while public capital expenditure on agriculture (PCEXA), Foreign agricultural grant (FAG) and public recurrent expenditure on agriculture (PREXA) did not have any significant influence on agricultural output as the probability values of their t-statistics were greater than 5%. From the result, ACGSF had a positive and significant effect on agricultural output, meaning that a one-unit increase in funding to the ACGSF brought **about** (0.357068**),** this might be due to the ACGSF disbursed directly to farmers therefore its positive influence on agriculture output. On the contrary, FAG, PCEXA and PREXA had no significant effect on agricultural output within the period under study, this might be because these funds were not used for the purposes which were earmarked for. The study concluded that foreign agricultural grant, government capital and recurrent expenditure to the agriculture sector do not have any significant effect on agricultural output. It was only funds directed to agricultural credit guarantee scheme that had positive effect on agricultural output in the country. The study concluded that government expenditure to the agriculture sector was not properly utilized. The study recommended that checks and balances be put in place by the government to monitor the disbursement and utilization of financial allocations to both capital and recurrent expenditure in the agricultural sector, foreign agricultural grants should be incorporated into the ACGSF as it is the expenditure portfolio that seems to have positive effect on agricultural output in the country.*

Keywords: *Agricultural Funding, Agricultural Growth, Agricultural Output, Public Capital Expenditure, Public Recurrent Expenditure, Agricultural Credit Guarantee Scheme Fund, Foreign Agricultural Grant.*

INTRODUCTION

The Food and Agriculture Organization (FAO) recommends that 25 per cent of government capital budget be allocated to agricultural development. This has not been achieved by the various administrations of Nigeria, thereby affecting government programmes and policies for the sector (Iganiga and Unemhili, 2011). Nigeria has also consistently failed to reach the 10 per cent agriculture budget standard of the Maputo declaration, which has led to negative implications for food security (Ochigbo, 2012). Total expenditure on agriculture, as a percentage of overall expenditure, fluctuated from 4.57 per cent between1986-1993, to an average of 4.51 per cent per annum between 1994-1998, to 3.53 per cent between 1999-2005; this reflects intensified efforts by the government to reduce its size (Udoh, 2011). This incessant reduction in agricultural expenditure over the years relative to the overall expenditure of Nigeria has led to inadequate funds for the sector. In this light, (Okoro and Ujah, 2009) emphasized that the inadequate funding of the agricultural sector could never make the sector sustainable.

While agricultural spending expressed as a share of total spending is generally low in African countries compared to other developing countries, Nigeria fares unfavorably even within the African context. When public spending in agriculture in Nigeria is benchmarked relative to public spending in other sectors, the value of the indicator for agriculture is lower than the values of all other sectors, such as industry, construction, trade, and services (Mogues *et al*., 2008).

(CBN, 2017) reported that in 1984, government capital spending on agriculture was 25 million naira while that of recurrent expenditure was 2 million naira. Also, in 1994, capital spending was 2.8 billion naira while recurrent expenditure was 1.2 billion naira. Furthermore, in 2017, capital expenditure on agriculture was 75 billion naira and that of recurrent was 68 billion naira. It is against this backdrop that this study tries to investigate the effect of agricultural funding on agricultural growth in Nigeria.

Objectives of the Study.

The broad objective of this study is to determine the effect of budgetary allocation on agricultural growth in Nigeria. The specific objectives are to

i. determine the effect of public capital expenditure on agricultural output in Nigeria from 1990-2020
ii. examine the effect of public recurrent expenditure on agricultural output in Nigeria from 1990-2020
iii. evaluate the effect of agricultural credit guarantee scheme on agricultural output in Nigeria from 1990-2020
iv. determine the effect of foreign agricultural grant on agricultural output in Nigeria from 1990-2020

Methodology

Research Design

This study adopted the quasi-experimental research design. The choice of this approach emanates from its appropriateness in assessing the impact of multivariate explanatory variables on a single dependent variable

Data Analysis

The study used Ordinary Least Square (OLS). The augmented dickey fuller test (ADF) was adopted as test of stationarity of the time series; the FMOLS was adopted to establish the relationship between the variables.

Model Specification.

The functional forms of the models are expressed as:

AOP = f (ACGSF, PCEXA, PREXA, FAG) …….. 1

Where: AOP = agricultural output
ACGSF = Agricultural Credit Guarantee Scheme Fund
PCEXA = Public Capital Expenditure to Agriculture
PREXA = Public Recurrent Expenditure to Agriculture
FAG = Foreign Agricultural Grants

Equations (5) is an explicitly expressed econometric model
The OLS model for the regression is specified as follows

$$lnAOP = \beta_0 + b_1 lnACGSF_1 \beta_2 ln\ PCEXA_2 + \beta_3 lnPREXA_3 + \beta_4 ln\ FAG_4 + \sum_t \ldots\ldots\ldots 6$$

where:

In = Log to base 10

β_0 = Constant

β_1- β_4 = Coefficients

$\sum_t$ = Statistic error term

RESULTS AND DISCUSSION

Time series trends of Agricultural Output (AOP) public capital expenditure on agriculture (PCEXA), public recurrent expenditure on agriculture (PREXA), agricultural credit guarantee scheme fund (ACGSF), foreign agricultural grants (FAG) in Nigeria, 1990-2020.

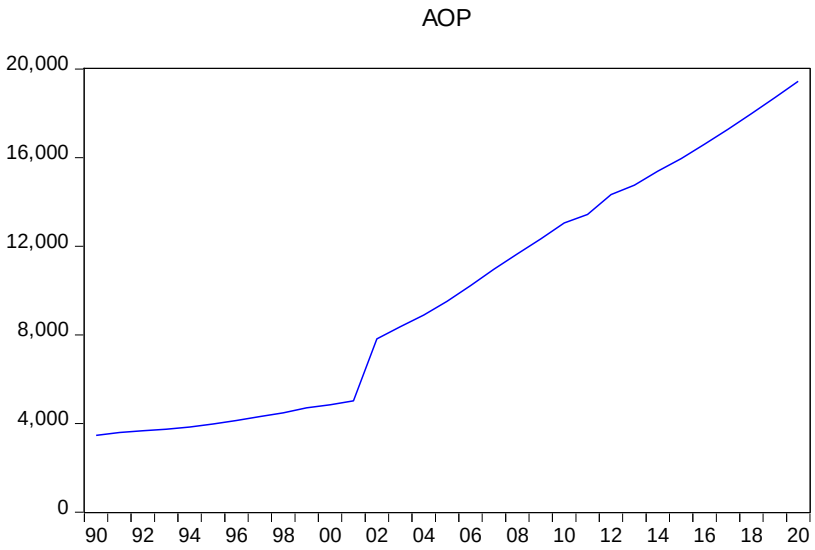
Table 1.

YEAR	PCEXA (₦ Million)	PREXA (₦ Million)	ACGSF (₦ Million)	Agric. Growth (₦ Billion)	FAG (₦ Million)
1990	1758.5	208.1	103,395.20	3,464.72	383270000
1991	551.2	121.1	80,859.60	3,590.84	378760000
1992	763	161.5	93,391.80	3,674.79	358120000
1993	1820	1,015.50	81,273.80	3,743.67	427680000
1994	2800.1	919	106,901.00	3,839.68	270420000

1995	4691.7	2,236.00	166,645.10	3,977.38	261450000
1996	3892.8	1,681.20	227,664.50	4,133.55	246750000
1997	6247.4	1,682.10	242,028.30	4,305.68	277230000
1998	8876.6	2,963.80	220,288.50	4,475.24	287100000
1999	6912.6	31,347.20	241,839.00	4,703.64	209800000
2000	5761.7	4,834.70	361,449.00	4,840.97	245770000
2001	57879	7,064.90	728,545.40	5,024.54	263430000
2002	32,364	12,439.40	1,050,982.30	7,817.08	419250000
2003	8510.9	7,534.30	1,151,051	8,364.83	384570000
2004	48047.8	11,725.60	2,083,744.70	8,888.57	654310000
2005	79393.4	10,858.80	9,493,854.50	9,516.99	6954730000
2006	15176.8	18,739.80	4,262,430.30	10,222.47	1238334000
2007	22518.5	15,781.40	4,425,461.50	10,958.47	1951130000
2008	58453.1	65,415.20	6,497,958.90	11,645.37	1271670000
2009	35879.3	22,440.10	8,328,565.80	12,330.33	1671210000
2010	47098.1	28,221.50	6,567,356.60	13,048.89	2061960000
2011	63056.3	41,201.30	7,312,700	13,429.38	1776670000
2012	74215.6	33,304.10	8,150,030.27	14,329.71	2061960000
2013	69871.7	39,436.40	10,005,594.33	14,750.52	1966860000
2014	86025.8	36,700.40	10,234,165.80	15,380.39	2045534400
2015	72367.9	41,271.20	12,432,129.62	15,952.22	2127355776
2016	76088.5	39,136.00	10,890,629.92	16,607.34	2212450007
2017	79132.04	40701.44	11326255.11	17271.63	2300948007
2018	82297.32	42329.49	11779305.31	17980.86	2392985927
2019	85589.22	44022.96	12250477.52	18700.09	2488705364
2020	89012.78	45783.87	12740496.62	19448.09	2588253579

Sources: CBN Statistical Bulletin

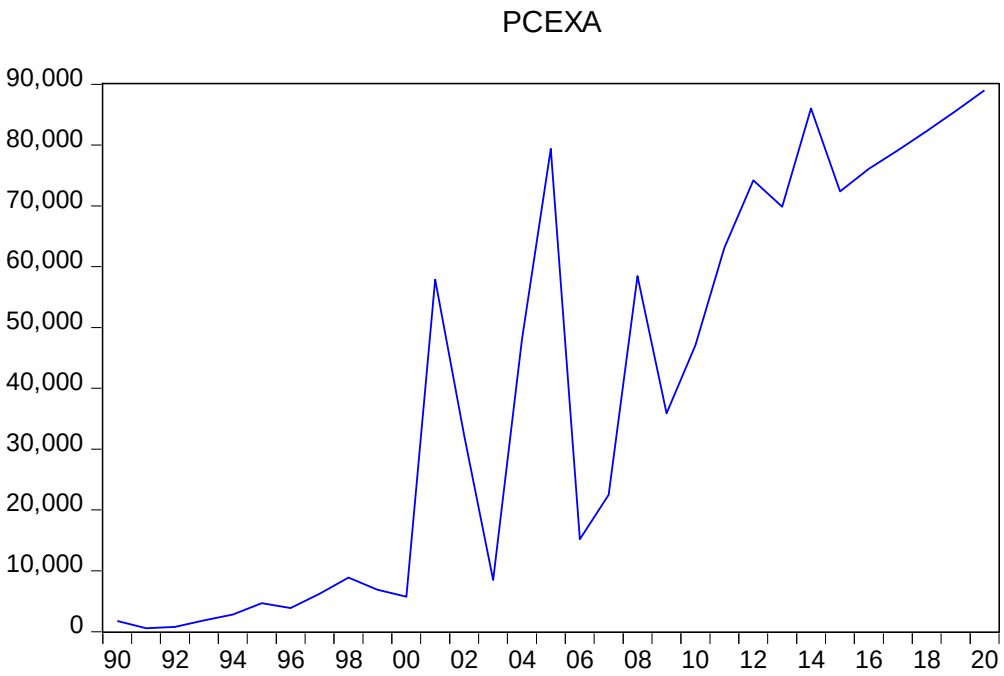
Trends in the Variables from 1990-2020



Source: *Graphical representation of agricultural output using e-views 10*

Figure 1: Trends in Agricultural Output over the period 1990-2020

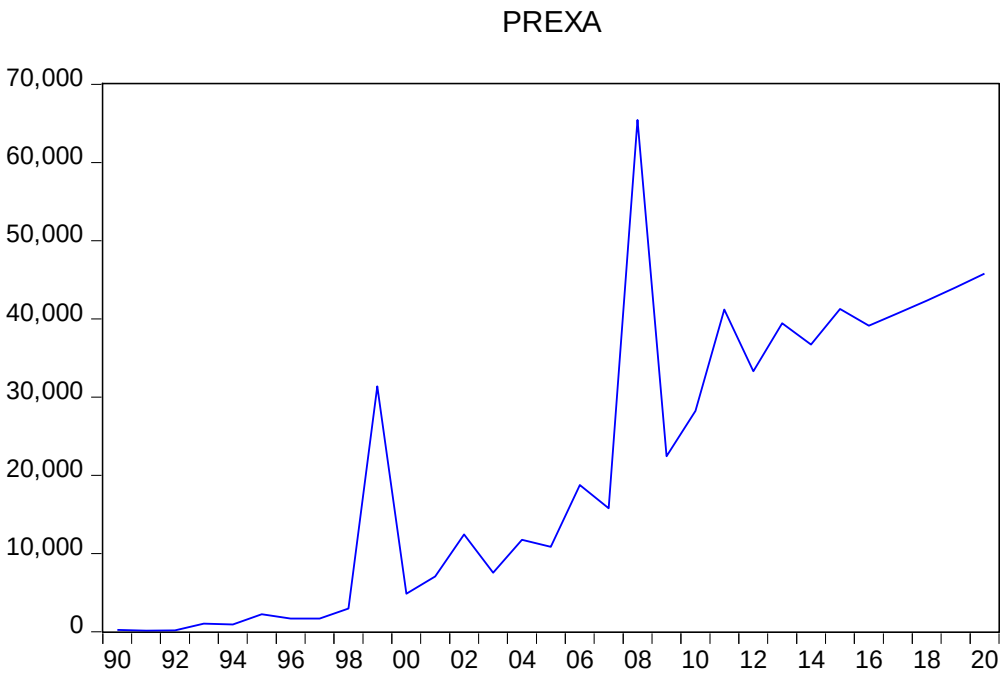
Figure 4.1 shows the trend analysis in agricultural output over the period 1990 – 2020. The trend graph, it could be deduced that agricultural output in Nigeria has been on the increase over the period under study. This study seeks to determine the effect budgetary allocation have on this steady increase in agricultural output.



Source: *Graphical representation of* ***public capital expenditure on agriculture*** *using e-views 10*

Figure 2: Trends in Public Capital Expenditure on Agriculture over the period 1990-2020

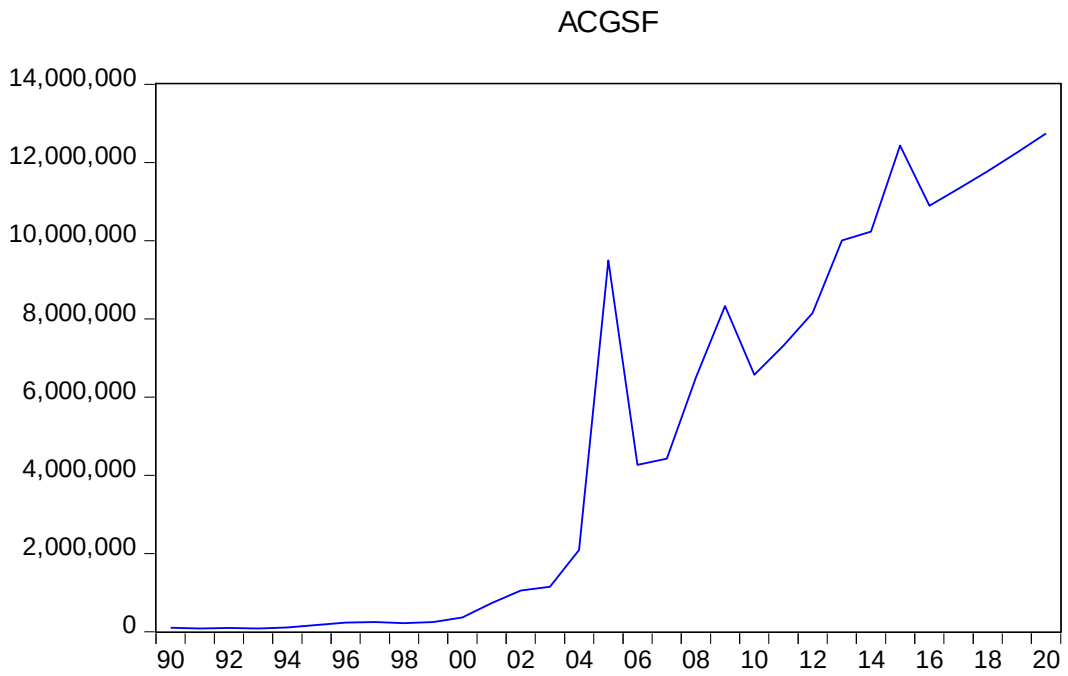
Figure 4.2 shows the trend in in governments capital expenditure on agriculture for the period under study being 1990 to 2020, and it could be seen from the trend that capital expenditure to the agricultural sector over the study period is marred with steep fluctuation, implying that the government have not been consistent with allocating resources to capital projects in agriculture, some years the values are on the increase and then followed by sharp decreases in funding. This trend will not encourage steady growth to the agricultural sector.



Source: *Graphical representation of* ***public recurrent expenditure on agriculture*** *using e-views 10*

Figure 3: Trends in Public Recurrent Expenditure on Agriculture over the period 1990-2020

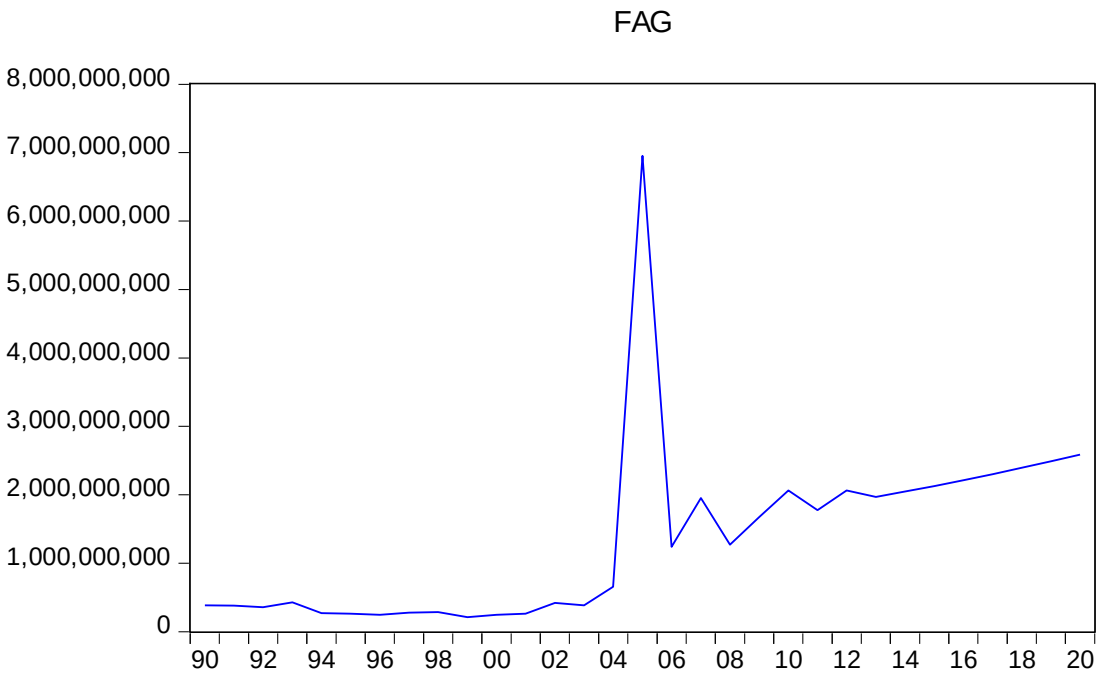
From figure 4.3, showed the trend in Public Recurrent Expenditure to the Agriculture sector from 1990 to 2020, from the trend it could be seen that 1999 and 2008 recorded higher allocation by the government to recurrent expenditure in the agriculture sector, there were fluctuations also in the allocations over the study period, but they were not as much as the fluctuations in the capital expenditure allocation on the average, it can be said based on the trend that governments allocation to recurrent expenditure in agriculture have been on the increase over the years.



Source: *Graphical representation of* ***agricultural credit guaranteed scheme funds*** *using e-views 10*

Figure 4: Trends in Agricultural Credit Guaranteed Scheme Fund over the period 1990-2020

From the trend analysis in figure 4.4, funds allocated to the agricultural credit guaranteed scheme have been on a steady increase from year 2000, with a sharp decline from 2005 to 2007 after which there have been increases with slight fluctuations. It is can be said that agricultural credit guaranteed scheme funding have been on the increase over the study period.



Source: *Graphical representation of* ***foreign agricultural grant*** *using e-views 10*

Figure 5: Trends in Foreign Agricultural Grants over the period 1990-2020

Foreign agricultural grants increased between 2004 to 2005 and dropped in 2006 and began to rise gradually from 2007. From the graph, foreign agricultural grants did not increase much over the period of study increased much over the study period.

Descriptive Statistics

The descriptive statistics which provided some basic information on the distribution of each of the variables are summarized in Table 4.2. The table showed a total of 31 observations of the dependent and independent variables.

Table 2 Descriptive analysis of Dependent and Independent Variables

	ACGSF	AOP	FAG	PCEXA	PREXA
Mean	4956047.	9884.449	1.36E+09	39582.38	21008.98
Median	4262430.	9516.990	1.24E+09	35879.30	15781.40
Maximum	12740497	19448.09	6.95E+09	89012.78	65415.20
Minimum	80859.60	3464.720	2.10E+08	551.2000	121.1000
Std. Dev.	4851925.	5426.715	1.36E+09	33416.32	18679.15
Skewness	0.328203	0.245558	2.229813	0.134547	0.447305
Kurtosis	1.454206	1.622196	10.04855	1.345440	2.014600

Jarque-Bera	3.642948	2.763569	89.86163	3.629556	2.287981
Probability	0.161787	0.251130	0.000000	0.162874	0.318545
Sum	1.54E+08	306417.9	4.22E+10	1227054.	651278.4
Sum Sq. Dev.	7.06E+14	8.83E+08	5.57E+19	3.35E+10	1.05E+10
Observations	31	31	31	31	31

Source: *Researcher's calculation with E-views 10*

A descriptive analysis of the series was undertaken to gain more information on each of the variables. The result revealed that response (dependent) variable, Agric. Output averaged 9884.449 billion Naira. This is an indicator that over the period 1990-2020, 9884.449 billion of the growth in the agricultural output is as a result of government funding to the agricultural sector through public capital expenditure, public recurrent expenditure, agricultural credit guaranteed scheme fund and foreign agricultural grant. The minimum AOP during the period is 3464.720 billion Naira while its maximum value stood at 19448.09 billion Naira. All the distributions are positively skewed. Jarque-Bera test shows that all the variables are normally distributed since their probability values do not exceed 5 %. In summary, the descriptive statistics revealed that all of the data sets are normally distributed. This is so because the probability values of the variables do not exceed 5 %.

4.4 Unit Root Test

The test for unit root preceded the estimation of the model due to its usefulness in exposing the time series properties of the variables. The optimal order of lag for each of the variables was based on Akaike information Criterion (AIC) automatic lag selection procedure. The tests results are showed in Table 4.3. The table showed that all the variables were stationary at level I (0).

Table 4.3: Results of Unit Root Test (using Intercept and Trend)

Variable	Unit root test	t-statistic	Critical value	Level (%)	Order of integration
AOP	ADF	5.944662	-2.644302	(1%)	I(0)
			-1.952473	(5%)	
			-1.610211	(10%)	
PCEXA	ADF	-6.298197	-4.309824	(1%)	I(0)
			-3.574244	(5%)	
			-3.221728	(10%)	
PREXA	ADF	-6.115586	-4.296729	(1%)	I(0)
			-3.568379	(5%)	
			-3.218382	(10%)	
ACGSF	ADF	-3.753510	-3.568379	(5%)	I(0)
			-3.218382	(10%)	

FAG	ADF	-5.447371	-4.296729	(1%)	I(0)
			-3.568379	(5%)	
			-3.218382	(10%)	

Source: *Authors computation from E-views 10.*

Unit root test was carried out using Augmented Dickey Fuller (ADF) Test to test for the stationarity of the variables under study, from the result in table 4.3, all the variables were stationary at levels given that their t-statistics values were greater than their critical values at the 1 percent, 5 percent and 10 percent level of significance except for ACGSF that was stationary at the 5 and 10 percent level of significance only. The stationarity of the variables here implies that the regression results are not spurious and the results obtained from the analysis are good for forecasting. Since all the variables were stationary at levels, there was no need to subject the variables to Cointegration test, the researcher proceeded to the regression analysis using the Ordinary Least Square (OLS) regression technique as all the variables were stationary at level.

4.5 Regression Result

The estimation of the model using Fully Modified Least Square (FMOLS) regression technique is presented in table 4.4.

Table 4.4 Ordinary Least Square (OLS) Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.858096	0.954377	5.090330	0.0000
LOG(ACGSF)	0.357068	0.068351	5.224011	0.0000
LOG(FAG)	-0.019588	0.073156	-0.267752	0.7910
LOG(PCEXA)	-0.087120	0.048777	-1.786081	0.0858
LOG(PREXA)	0.036167	0.039585	0.913646	0.3693
R-squared	0.963050	Mean dependent var		9.028943
Adjusted R-squared	0.957365	S.D. dependent var		0.615170
S.E. of regression	0.127021	Akaike info criterion		-1.142234
Sum squared resid	0.419494	Schwarz criterion		-0.910946
Log likelihood	22.70463	Hannan-Quinn criter.		-1.066840
F-statistic	169.4133	Durbin-Watson stat		0.843993
Prob(F-statistic)	0.000000			

Source: *Authors computation from E-views 10.*

From the regression result in table 4.4, it could be seen that only agricultural credit guaranteed scheme fund (ACGSF) was positively significant in influencing agricultural output in the period under study (1990-2020) as the probability values of its t-statistics were less than 5%, implying that an increase in ACGSF will lead to an increase in agricultural output. This finding agrees with the findings of Dori (2016), Florence and Nathan (2020), Islam (2020), Ahn, Gan and Ahn (2020), and Bahsi and Cetrin (2020), who found a positive significant relationship between Agricultural Credit Guarantee Scheme Fund and agricultural output.

Public capital expenditure on agriculture (PCEXA) and public recurrent expenditure on agriculture (PREXA) did not have any significant influence on agricultural output as the

probability values of their t-statistics were greater than 5%. These findings agree with the work of Okidim, and Albert (2012) on the effect of budgetary allocation to the agricultural sector and its effect on agricultural output in Rivers State, (1999-2010) who found that there is significant relationship between budgetary allocation and agricultural output. However, this finding is in contrast to the findings of Wangusi and Muturi (2015), Iganiga and Unehilim (2011), Adofu, Abula and Agama (2012). FAG had no significant effect on agricultural output under the period under study this might be because these funds are not used for the purposes which they were earmarked for. This finding is in sharp contrast to the findings of Alabi (2014), Akpokodje and Omojomite (2008), and Kaya (2008) who found a significant relationship between Foreign Agricultural Grant and agricultural output.

4.6 Post-estimation (Diagnostics) Tests Results

The results for the post-estimation (diagnostics) tests are presented in this section

4.6.1 Serial Correlation Test

The Breusch-Godfrey serial correlation LM test was used to test whether there is serial autocorrelation in the model. The result after the test showed that the model is free from serial correlation in the long run. The result of the test is displayed in Table 4.7

Table 4.7 Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.580182	Prob. F(2,24)	**0.2266**
Obs*R-squared	3.607142	Prob. Chi-Square(2)	0.1647

Source: *Author's Compilation from E-views 10*

It was deduced based on the Breusch-Godfrey serial correlation test result for the model shows that the model is free from serial auto correlation. This is because the corresponding probability value of the test statistics is greater than 0.05. Hence, there is no evidence of serial correlation among the variables.

Conclusion and Recommendations

Based on the OLS regression results foreign agricultural grant, governments capital and recurrent expenditure to the agriculture sector does not have any significant effect on agricultural output. It was only funds directed to agricultural credit guarantee scheme that had positive effect on agricultural output in the country. The study concluded that government expenditure to the agriculture sector is not properly utilized. The study recommends checks and balances should be put in place by the government to monitor the disbursement and utilization of financial allocations to both capital and recurrent expenditure in the agricultures sector. Foreign agricultural grants should be incorporated into the ACGSF as it is the expenditure portfolio that seems to have positive effect on agricultural output in the country.

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