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THE NEXUS BETWEEN INFRASTRUCTURE DEVELOPMENT AND AGRICULTURAL GROWTH IN NIGERIA

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ABSTRACT: *The study examined the impact of infrastructure development on agricultural growth in Nigeria during the period 1990-2022. Key variables examined include public capital expenditure on economic services (PCEES), employment in agriculture (EMPA), research and development (RD), domestic credit to the private sector (DCPS), and agricultural output. Statistical analysis using the Ordinary Least Square (OLS) technique was employed, along with the Augmented Dickey-Fuller (ADF) unit root test to ensure the stationarity of the time series data, and the Johansen cointegration test to assess the long-run relationship between the dependent and independent variables. Our results show that all variables, except research and development, were stationary at first difference. The Johansen cointegration test conclusively demonstrated the existence of a long-run relationship in two cointegrating equations. Furthermore, the results from the Ordinary Least Squares (OLS) technique reveal that public capital expenditure on economic services, domestic credit to private sectors, and research and development were found to have a positive correlation with agricultural output in Nigeria. Conversely, employment in agriculture (EMA) was identified as having a negative effect on agricultural output in the country. The study recommends increasing investment in public capital expenditures on economic services. Moreover, establishing research institutes focused on agriculture in each state can provide valuable insights and solutions to boost the sector's productivity.*

KEYWORDS: Infrastructure, Agriculture, Employment, OLS, Nigeria

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INTRODUCTION

Nigeria is a country with economic potential and large abundant resources. It has rich land and water resources that are ripe for further agricultural exploitation. Nigeria has an arable land area of 34 million hectares: 6.5 million hectares for permanent crops, and 28.6 million hectares for meadows and pastures. Agriculture remains the bedrock for economic growth and development in Nigeria. Nigeria's agricultural sector contributes to a significant part of the country's GDP. Between July and September 2021, agriculture contributed to almost 30 percent of the total GDP, an increase of about six percentage points compared to the previous quarter. As reported by the Food and Agriculture Organization, agriculture remains the foundation of the Nigerian economy, despite the presence of oil in the country. It is the main source of livelihood for most Nigerians. Agriculture is a key activity for Nigeria's economy after oil. The battle for long-term economic growth will be won or lost in the agricultural sector (Myrdal 1984). We cannot talk about economic prosperity in our nation if we do not focus on agriculture as a key driver for economic growth. This sector has the potential to be the industrial and economic springboard from which a country's growth can take off. Indeed, more often than not, agricultural activities are usually concentrated in the less developed rural areas where there is a critical need for rural transformation, redistribution, poverty alleviation and socio-economic development (Zagpish, 2001). A strong and efficient agricultural sector would enable a country to feed its growing population, generate employment, earn foreign exchange and provide raw materials for industries (Ogen, 2007).

Infrastructure development is crucial for agricultural growth in Nigeria. Infrastructure development is the construction and improvement of basic foundational amenities in order to stimulate economic growth and improve quality of life. This includes but is not limited to digital infrastructure, transportation, power infrastructure and grant or credit facilities. Infrastructural development is a key driver of economic progress and a critical enabler of productivity (Patel & Obeng, 2014). Economic development theorists have identified infrastructure as critical in agricultural productivity. This implies that the productivity capacity of agriculture depends on the adequacy of infrastructure, especially those that aid agricultural productivity (Edeme et al. 2020). Infrastructure development is a panacea to quality agricultural output and by extension economic growth. In other words, we cannot talk of accelerated economic growth if we do not have quality infrastructure in place. The importance of transportation, electricity, grants or credit to farmers as well as access to information and its impact on food production and economic growth cannot be overemphasised. Transportation infrastructure eases the movement of goods and services in rural settlements, which in turn enhances the sources of income of the countryside agriculturists (Ajiboye & Afolayan, 2009). Electricity is an important input in agricultural production. It is usually used for lighting, operation of machinery as well as production of raw materials. Access to grants and credit enables farmers to procure storage facilities that will in turn reduce food loss and waste. Access to information enhances human capabilities which in turn impacts on agricultural development.

Despite the huge potential of Nigeria in the agricultural sector, productivity level and contribution to growth and foreign exchange earning capacity have been low. Nigeria has not been able to attain self-sufficiency in food production and value chains that can promote job creation and enhance government revenue (Hassan & Odugbemi 2017). This is attributed to poor infrastructure needed to boost agricultural production hence the need for this study. This paper is intended to review the menace of infrastructural development in Nigeria while

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identifying the causative factors and coping strategies that can facilitate agricultural growth in Nigeria.

Some empirical research has been carried out on the impact of infrastructure development on agricultural growth. Ighodaro (2011) analysed this study with the use of time series data for over four decades and the Parsimonious Error Correction Model estimation technique. It was found that various performance indicators with respect to physical infrastructure used for the study have not been encouraging in Nigeria; however, the research was limited to the provision of roads and telecommunications facilities. This study made some contributions to this growing literature. A major contribution of this paper is the use of the ordinary least square (OLS) method estimation technique and the use of government expenditure on infrastructure, the inclusion of access to information and technology as well as grants and credit facilities as variables with a view of contributing to the revenue of the nation, employment generation, improving agricultural productivity and economic growth in the long run. These three variables will further capture the effect of infrastructure development on agricultural growth. Research on this issue is pertinent to help inform policy decisions regarding resource allocation to infrastructure development that will bring about rapid growth in the agricultural sector.

LITERATURE REVIEW.

This section examines theories that deal with infrastructural development and agricultural growth.

Endogenous Growth Theory

According to the endogenous growth theory, the development of infrastructure can augment the growth of the agricultural sector by promoting technological progress and innovation, enhancing human capital, and improving agricultural research and development. This theory implies that infrastructure development can foster long-term, sustainable growth in the agricultural sector. The Endogenous Growth Theory was developed in the 1980s as a different approach to the Neoclassical Growth Theory. It challenged the idea that gaps in wealth between developed and underdeveloped countries could continue to exist despite investment in physical capital such as infrastructure, which is subject to diminishing returns. A study by Tariq et al. (2020) in Pakistan found that investments in agricultural infrastructure, such as irrigation systems and agricultural research and development, had a positive impact on agricultural productivity and growth, as well as on poverty reduction.

The Theory of Infrastructure-led Development:

Agenor (2010) developed the Theory of Infrastructure-led Development, which proposes a long-term economic development strategy based on public infrastructure as the primary driver of growth. The theory suggests that government investment in both agriculture and public infrastructure can increase the productivity of both sectors. However, the theory highlights that the effectiveness of public investment in infrastructure is critical for generating desirable effects. Inefficient public investment may not yield significant improvements in productivity. The theory also points out that low levels of infrastructure can force producers to adopt inefficient technology, leading to poor and low productivity

Overall, these theories suggest that infrastructure development can have a positive impact on agricultural growth, by improving the efficiency of production, stimulating investment,

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enhancing knowledge and innovation, and improving institutional quality. However, the effect of infrastructure development on economic growth may vary across countries and regions and may depend on factors such as the quality of infrastructure, the level of development, and the institutional context.

Empirical Literature Review

Adesina and Mbila (2016) used panel data to investigate the impact of infrastructure development on agricultural productivity in Nigeria. The study found that road infrastructure had a significant positive impact on agricultural productivity, while electricity infrastructure had a positive but insignificant impact. The study suggested that improving road infrastructure could be an effective strategy for promoting agricultural growth in Nigeria.

Aremu and Kazeem (2017) investigated the impact of infrastructure development on agricultural output in Nigeria using a vector error correction model (VECM) and data covering the period from 1980 to 2015. The study found that infrastructure development had a significant positive impact on agricultural output, with electricity infrastructure having the largest impact followed by transport infrastructure. The study suggested that investment in infrastructure could contribute significantly to improving agricultural output in Nigeria.

Ezeaku et al. (2019) examined the impact of infrastructure development on agricultural growth in Nigeria using a vector autoregression (VAR) model and data covering the period from 1981 to 2016. The study found that electricity infrastructure had a positive and significant impact on agricultural growth, while road infrastructure had a positive but insignificant impact. The study suggested that improving electricity infrastructure could be an effective strategy for promoting agricultural growth in Nigeria.

Bello et al. (2020) investigated the impact of infrastructure development on agricultural productivity in Nigeria using a panel data of 36 states covering the period from 1990 to 2017. The study found that road infrastructure had a significant positive impact on agricultural productivity, while electricity infrastructure had a positive but insignificant impact. The study suggested that improving road infrastructure could be an effective strategy for promoting agricultural productivity in Nigeria.

Nwachukwu et al. (2021) examined the impact of transport infrastructure on agricultural productivity in Nigeria using a panel data of 36 states covering the period from 2000 to 2018. The study found that transport infrastructure had a positive and significant impact on agricultural productivity and that this effect was stronger in the northern region of the country. The study suggested that improving transport infrastructure could be an effective strategy for promoting agricultural productivity in Nigeria.

Omotayo and Oloyede (2016) studied the impact of rural infrastructure on agricultural productivity in Nigeria using a survey data of 200 farmers. The study found that rural infrastructure, including electricity and water supply, had a positive impact on agricultural productivity in Nigeria. The study suggested that improving rural infrastructure could be an effective strategy for promoting agricultural growth in Nigeria.

Suleiman and Zainab (2019) investigated the impact of irrigation infrastructure on agricultural productivity in Nigeria using a survey data of 220 farmers. The study found that improved access to water resources through irrigation infrastructure had a positive impact on agricultural

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productivity in Nigeria. The study suggested that investment in irrigation infrastructure could be an effective strategy for promoting agricultural growth in Nigeria.

Olatunji et al. (2021) examined the impact of agricultural infrastructure investment on agricultural productivity in Nigeria using panel data from 36 states covering the period from 1990 to 2017. The study found that investment in agricultural infrastructure, including roads, storage facilities, and irrigation systems, had a positive impact on agricultural productivity in Nigeria. The study suggested that investment in agricultural infrastructure could be an effective strategy for promoting agricultural growth in Nigeria.

Most of the empirical research on this study limited itself to road infrastructure, electricity and irrigation which is not sufficient enough to examine the impact of infrastructure development on agricultural growth. To address the issue of variable omission bias and fill the gap in previous studies, this study included additional variables which include technological infrastructure and grants to farmers in its empirical model.

RESEARCH METHODOLOGY

Theoretical Framework

The study adopts the endogenous and public infrastructure theory as a theoretical framework for this study due to their significance and emphasis on infrastructural development and its contribution to agricultural productivity which enhances economic growth.

Model Specification and Estimation Technique

To meet the core objective of this study, the task of this section is to construct a model relating to the various key variables identified as factors within the context of the topic. Hence, for this purpose, we adopt the model used by Edeme et al. (2020) which is specified thus:

$$AGR\_P = f(ELC, TRAN, IFC, EMPA, AGR\_D) \quad (1)$$

The above model will be modified to incorporate relevant variables to reflect the current study's objective. Hence, ELC is electricity (access to electricity in rural areas as % of the population), TRAN is transport infrastructure (rural roads), IFC is access to and use of information and communication technology (access and use of ICT composite index) will be aggregated as public capital expenditure on infrastructure while introducing other variables such as research and development and access to loans.

In relating this to the study

$$AGR\_P = f(PCEES, EMPA, RD, DCTP) \quad (2)$$

The mathematical model is stated as

$$AGR\_P = PCEES + EMPA + RD + DCTP \quad (3)$$

The econometric form will be

$$AGR\_P_t = \beta_o + \beta_1 PCEES_t + \beta_2 EMPA_t + \beta_3 RD_t + \beta_4 DCTP_t + \mu_t \quad (4)$$

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Where AGR_P is agricultural output, PCEES is public capital expenditure on economic services, EMPA is employment in agriculture (% of total employment), RD is research and development and DCTP is domestic credit to the private sector (% of GDP).

β_o = Constant/intercept term

$\beta_1 - \beta_4$ = Coefficient of the parameter estimated for the slope.

μ = Error or disturbance term

t = time period.

Taking the natural logarithmic form:

$$LnAGR\_P_t = \beta_o + \beta_1 LnPCEESt + \beta_2 EMPA_t + \beta_3 LnRDt + \beta_4 DCTP_t + \mu_t$$

Where

Ln = Logarithm

The method of analysis adopted in this study would be that of the ordinary least square (OLS) technique, the Augmented Dickey-Fuller (ADF) unit root test, which is used to test for stationarity of the time series data in the study, Johansen cointegration test is used to test the long-run relationship between the dependent and independent variables. The OLS is adopted compared to other econometric techniques due to its unbiased properties of consistency, efficiency and simplicity in handling and interpreting results arising thereof, the OLS is equally chosen based on its reliability, because its error term has a minimum and equal variance.

Data Sources and Explanation of Variables.

The study used secondary data obtained from the publications of the Central Bank of Nigeria (CBN) and World Bank Indicators (WDI). The data span from 1990 to 2022. The major variables for which data is collected are defined as follows.

Agricultural Output (AGR_P): This refers to agricultural productivity and it is the dependent variable of this study. It is measured as the contribution of agricultural output to the gross domestic product in millions of Naira.

Public Capital Expenditure on Economic Service (PCEES): This has to do with government expenditure on transport and communication, road and construction infrastructure and agriculture. It is used as an independent variable and serves as a proxy for government expenditure on infrastructure, etc. It is measured in billions of Naira.

Employment in Agriculture (EMPA): This refers to the number of persons working in the agricultural sector. It is a major independent variable and is measured as a percentage of total employment.

Research and Development (RD): This is described as the effort devoted to innovation, and improvement in the country. It is used as an independent variable and is measured as an index.

Domestic Credit to Private Sector (DCPS): This refers to the loans made available to the private sector. It is a proxy for access to loans which accounts for the ease and availability of

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loans to the private sector, especially those involved in agriculture. It is measured as a percentage of GDP.

DATA PRESENTATION, ANALYSIS AND RESULT

The study employed the use of econometric tools in the analyses of the variables shown in the model. The Eview package was used in the estimation process and results are presented in tables.

Data Analysis and Presentation

The time series data were analysed and are shown in the appendices. The descriptive statistics showed that all variables (agricultural output, public capital expenditure on economic services, domestic credit to the private sector, and employment in agriculture) were normally distributed except research and development which can be seen in Appendix 2.

The Augmented Dicky Fuller unit root was used to determine the stationarity of all the variables as seen in Table 4.1.

Table 4.1: Summary of ADF Unit Root Test

Variable	ADF Critical value @ 5%	ADF Statistic	Order of Integration
ARG_P	-2.963972	-3.580578	I (1)
PCEES	2.960411	-8.439557	I (1)
EMA	-2.960411	-3.168771	I (1)
RD	-2.95711	4.608478	I (0)
DCTP	-2.967767	-5.047889	I (1)

Source: Authors' Compilation from Eviews 10

Table 4.1 shows that all the variables are stationary at order 1 except research and development which is stationary at level.

The cointegration test identifies the number of cointegrating relationships that exist among these variables as seen in Table 4.2.

Table 4.2: Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**

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None *	0.907666	128.3685	69.81889	0.0000
At most 1 *	0.572057	56.89834	47.85613	0.0056
At most 2 *	0.476834	31.43536	29.79707	0.0321
At most 3	0.327731	11.99968	15.49471	0.1569
At most 4	0.002888	0.086762	3.841466	0.7683

Source: Authors' computation from Eviews 10

Evidence from Table 4.2 shows that there is the existence of a long-run relationship since there are two integrating equations given that the trace statistics are greater than the critical value at a 5% level of significance.

Ordinary Least Square (OLS) Result

The study subjects the model to ordinary least squares to generate the coefficients of the parameters of the regression model. The result is presented in Appendix 9 and summarised in Table 4.3 below:

Table 4.3: Summary of Ordinary Least Square (OLS) Result

Dependent variable: LnARG_P

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EMA	-0.125599	0.016348	-7.682866	0.0000
LNRD	0.141171	0.041702	3.385264	0.0021
LNPCEES	0.514826	0.046617	11.04367	0.0000
DCTP	0.008869	0.020021	0.443011	0.6612
C	11.69164	0.820340	14.25219	0.0000

R-squared	0.979228	F-statistic	329.9972
Adjusted R-squared	0.976261	Prob(F-statistic)	0.000000
Durbin-Watson stat	1.544377		

Source: Authors' computation from Eviews 10

To discuss the regression results as presented in Table 4.3, the study employs economic a priori criteria, statistical criteria and econometric criteria.

Following the econometric criteria, the study showed that public capital expenditure on economic services, domestic credit to private sectors and research and development have shown to exhibit a positive relationship with agricultural output in Nigeria. Thus, public capital expenditure on economic services, domestic credit to private sectors and research and development, will cause an increase in agricultural output in Nigeria and vice versa. On the

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other hand, employment in agriculture (EMA) has a negative effect on agricultural output in Nigeria, implying that an increase in employment in agriculture leads to a decrease in agricultural output in Nigeria. As a matter of fact, all the variables had a positive relationship with agricultural output, with the exception of employment in agriculture. Also, it is observed that all the variables conform to the a priori expectation of the study with the exception of employment in agriculture. The non-conformity of employment in agriculture could be due to diminishing marginal utility.

The statistical criteria apply the R^2, adjusted R^2 and the F–test to determine the statistical reliability of the estimated parameters. From the OLS results, the R^2 of 0.979228 indicated that the explanatory power of the variables is extremely high and very strong. This implies that about 97.9% of the variations in agricultural output are being accounted for or explained by the variations in public capital expenditure on economic services, domestic credit to private sectors, employment in agriculture and research and development in Nigeria. While other possible determinants of agricultural output not captured in the model explain about 3.1% of the variation in agricultural output in Nigeria. The adjusted R^2 in Table 4.3 supports the claim of the R^2 with a value of 0.976261 indicating that about 97.6% of the total variation in the dependent variable (agricultural output) is explained by the independent variables (the regressors). Thus, this shows there is an extremely high goodness of fit. The F- statistics having the F calculated as 329.9972 is greater than the F-tabulated at a 5% level of significance which is 2.56. This shows the overall significant impact of the independent variables on agricultural output.

The econometric criteria involve testing this model for autocorrelation, heteroscedasticity and multicollinearity. The results of these three tests are given in Table 4.4 and Appendix 10-12. For the Breusch-Godfrey LM serial correlation test, we can see that the null hypothesis cannot be rejected at a 5 percent level. That means this model is free from autocorrelation in the errors. Also, in the Breusch-Pagan-Godfrey test for heteroscedasticity, we cannot reject the null hypothesis at the 5 percent level. Therefore, these variables are homoscedastic, and there is no problem with heteroscedasticity while for multicollinearity, the study concluded that the explanatory variables are not perfectly linearly correlated, as the centred VIF coefficients do not exceed 10.

Table 4.4: Summary of Autocorrelation, Heteroscedasticity and Multicollinearity Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.759322	Prob. F(2,26)	0.4781
Heteroscedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.357383	Prob. F(4,28)	0.8367
Variance inflation factor			
	Coefficient	Uncentered	Centred
Variable	Variance	VIF	VIF
EMA	0.000267	231.9299	3.854084
LNRD	0.001739	16.01466	3.809568
LNPEES	0.002173	28.51457	2.462518
DCTP	0.000401	21.08675	2.090039
C	0.672958	301.9903	NA

Source: Authors' computation from Eviews 10

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The analysis was concluded with the CUSUM Square stability test which can be seen in Appendix 13. It showed that the model is stable since it was in between the 5% level of significance.

Evaluation of Research Hypotheses

The t-test is used to know the statistical significance of the individual parameters. Two-tailed tests at a 5% significance level were conducted. Here, the study compares the estimated or calculated t-statistic with the tabulated t-statistic at $t_{\alpha/2} = t_{0.05} = t_{0.025}$ (two-tailed test).

Degree of freedom (df) = n-k = 33 -5= 28

So, the study has $T_{0.05}$ (28) = 2.05 … … … Tabulated t-statistic.

The decision rule is to reject the null hypothesis if the calculated t-value is greater than the tabulated t-value, otherwise accept the alternative hypothesis.

Hypothesis one

H_0: There is no significant impact of public capital expenditure on economic services on agricultural output

H_1: There is a significant impact on public capital expenditure on economic services on agricultural output.

We reject the null hypothesis since the t calculated of 11.04367 is greater than the t- tabulated and accept the alternative hypothesis. Thus public capital expenditure on economic services, a proxy of government expenditure on infrastructure, has a significant impact on agriculture output.

Hypothesis two

H_o: There is no significant impact of research and development on agricultural output.

H_1: There is a significant impact of research and development on agricultural output

We reject the null hypothesis and accept the alternative hypothesis since the t- calculated of 3.385264 is greater than the t-tabulated. Thus research and development have a significant impact on agricultural output.

Hypothesis three

H_0: Domestic credit to private sectors has no significant impact on agricultural output

H_1: Domestic credit to private sectors has a significant impact on agricultural output.

Decision rule: We accept the null hypothesis given that the t-calculated of 0.443011 is less than the t-tabulated of 2.05. Thus domestic credit to the private sector insignificantly affects agricultural output.

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Discussion of Findings and Policy Implications

The discussion is done based on the analysis and results of the study. The study analysed the impact of infrastructural development on agricultural growth in Nigeria. Starting from the descriptive statistics, all the variables were normally distributed except research and development. The findings of the ADF test showed that all the variables were stationary at first difference apart from research and development. This was supported by the Johansen cointegration test which identified the existence of a long-run relationship in two cointegrating equations. The results from the method of analysis adopted, that is Ordinary Least Squares showed that through increased public capital expenditure on economic service, domestic credit to the private sector and research and development, Nigeria can achieve agricultural growth.

Specifically, public capital expenditure on economic services has a positive and statistically significant impact on agricultural output. This means that as more expenditures are made on economic services (government expenditure on infrastructures) in Nigeria, there would be an increase in agricultural growth and vice versa. This result is consistent with that of Olatunji et al. (2021) and Bello et al. (2020). Also, research and development had a positive and statistically significant impact on agricultural growth. Thus more innovations, inventions and research undertaken by the Nigerian government on agriculture will trigger increased agricultural growth. Furthermore, domestic credit to the private sector had a positive but insignificant impact on agricultural growth. This implies that as more loans are provided to the private sector, there would be an increase in agricultural growth but it is insignificant because the policies with regard to access to loans are not sufficient to cause a meaningful increase in agricultural growth.

However, employment in agriculture shows a negative and significant impact on agriculture growth which does not conform to theoretical expectations. Thus as more persons are employed in the agriculture sector, there would be a reduction in agriculture growth. This is either due to diminishing marginal returns, factors that have hindered agricultural growth such as natural disasters or the inefficiency of workers due to paucity of advanced skill in agriculture, among others. This result contradicts that of Edeme et al. (2020) who found a positive significant impact on agricultural growth.

Finally, the specified model for this study passed all the statistical and econometric tests showing that the above findings are reliable and useful for predictions and policymaking. While the post-estimation test using the CUSUM stability test showed that the model is stable. The policy implication from the above findings shows that policy shift on the significant variables (public capital expenditure on economic services, employment in agriculture and research and development) should be expected to bring about significant changes in agriculture growth in Nigeria. Specifically, policies that will improve public capital expenditure on economic services and research and development will all bring about an increase in agricultural growth in the Nigerian economy. Similarly, policy measures (monetary and fiscal policies) that could increase the efficiency of employed persons in agriculture will reduce a negative impact on the agricultural output of the Nigerian economy.

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CONCLUSION AND POLICY RECOMMENDATIONS

The general conclusion that emerged from this study is that during the period under review, public capital expenditure, employment in agriculture and research and development are effective in determining the agricultural growth in Nigeria and there should be policy actions in relation to these variables for the achievement of improved and consistent agricultural growth. Based on the conclusions of this study, the following recommendations are hereby made:

The federal government should through budgetary allocations increase the investment in public capital expenditures on economic services compared to the recurrent expenditures for road and construction, transport and telecommunication and agriculture. In addition, there should be proper asset maintenance of these infrastructures through maintenance planning.

Also, the federal and state governments should establish research institutes related to agriculture at least in every state. This would improve and encourage innovative agricultural systems and practices that would improve agricultural growth in Nigeria.

Though the federal and state government provide loans to the private sector, especially agriculture, this study recommends the need for increased supervision by both tiers of government on the usage of loans for agricultural production for which it was acquired and to ensure the ease and availability of these loans to the small-scale agricultural business.

REFERENCES

Adedipe, N. O., & Adesanya, A. O. (2018). Infrastructure development and agricultural productivity in Nigeria. Journal of Agricultural and Environmental Sciences.

Adepoju, A. A., & Salau, A. S. (2020). Impact of infrastructure development on agricultural productivity in Nigeria. Journal of Agricultural Extension.

Banerjee, R., Sharma, M., & Murthy, K. (2019). Impact of rural infrastructure on agricultural productivity and income in India. Agricultural Economics Research Review.

Chukwu, S. I., & Onyenweaku, C. E. (2018). Impact of infrastructure development on agricultural productivity in Nigeria: A case study of Ebonyi State. Journal of Environmental Management and Tourism.

Dada, O. O., & Ojo, S. O. (2018). Infrastructure development and agricultural output in Nigeria: An ARDL approach. Journal of Economic and Sustainable Development.

Edeme, R. K., Nkalu, N. C., Idenyi, J. C., & Arazu, W. O. (2020). Infrastructural Development, Sustainable Agricultural Output and Employment in ECOWAS Countries.

Folarin, O. A., & Osabohien, R. (2019). Infrastructure development, agricultural productivity and poverty reduction in Nigeria. African Development Review.

Hassan, A. E., & Hassan, O. T. (2017). The dynamics between Infrastructure and Agricultural Output in Nigeria.

Ndiwa, N. N., Simatwa, E. M. W., & Mugo, H. M. (2020). Analysis of rural infrastructure on agricultural productivity and rural livelihoods in Western Kenya. Journal of Agricultural and Food Systems.

Ogbaro, E. O., & Omotoso, D. C. (2017). The Impact of Infrastructure Development on Economic Growth in Nigeria. Nigerian Journal of Management Sciences, 6(1), 2017.

Article DOI: 10.52589/AJESD-EDHRB3H1
DOI URL: https://doi.org/10.52589/AJESD-EDHRB3H1

Ogen, O. (2007). The Agricultural sector and Nigeria's development: Comparative Perspectives from the Brazilian Agro-Industrial Economy, 1960-1995.

Sertoğlu, K., Ugural, S., & Bekun, F. V. (2017). The Contribution of the Agricultural Sector to the Economic Growth of Nigeria. International Journal of Economics and Financial Issues, ISSN: 2146-4138.

Article DOI: 10.52589/AJESD-EDHRB3H1
DOI URL: https://doi.org/10.52589/AJESD-EDHRB3H1