Impact of Real Agricultural Outputs, Human Capital and Power Supply on Nigeria's Real Economic Growth (1981-2020).

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Abstract- For over three decades (1981-2020), the Nigerian government has set out various policies to stimulate the country's real economic growth. The government did this by inducing funds in different sectors: agriculture, education, health and power. Contrastingly, the desired outcome of real economic growth has not been achieved. Hence, this study examined the impact of real agricultural outputs, human capital and power supply on Nigeria's real economic growth using quarterly time-series data from 1981- to 2020; and exploited the Cobb-Douglas Production for theoretical backings. After reviewing relevant works of literature, the analytical techniques (Johansen cointegration (long-run relationship) and Dynamic Ordinary Least Squares (DOLS) (long-run impacts) were found worthy and were employed. The result of Johansen cointegration indicated a long-run equilibrium relationship in the model, while the Dynamic OLS result revealed that real agricultural output has been the key sector contributing the highest level of impact among other variables of interest to Nigeria's real economic growth. Divergently, public spending on health and electricity has not significantly contributed to Nigeria's real economic growth. Thus, we conclude that real agricultural output has yielded a positive and significant impact on the nation's growth, whereas spending on human health and electricity and gas is yet to impact positively on the economy's growth. The study recommends that policymakers in the health and electricity sectors (Ministry of Health and power) should intensify the need for more public investment, and proper monitoring of the allocated funds to these sectors. These should be done so that the funds can be prudently utilized and accounted for which can consequently bring about positive impact in the lives of Nigerians.

Index Terms- Agriculture, Education, Health, Economic Growth, and Nigeria

I. General Introduction

Globally, every economy's economic growth and development are hinged on some key sectors (agriculture, education, health, and power supply) impacts which cannot be overridden. These sectors' contributions are classified based on the role that each sector performs in the economy (primary, secondary, or tertiary), and usually, the contributions of these sectors are lumped or interwoven thus, making it difficult to ascertain the impact of each sector at the end of a fiscal year. This is the crux that most third-world economies are yet to vividly explore and optimize as these sectors are not properly guided and lack financial backings (Arikpo, et al., 2019; Aigbenedion, et al., 2017; Oyetade, Shri, and AbdulRazak 2016 Pius and Abel 2015). Distinctively, in America; Europe, and Asia; sectors like Agriculture, education, health, and power are given high priority with great backing in finance, research, and technology. These regions support these sectors because they understand how pivotal they are to the growth of the economy. Thus, the prudent engagement of these sectors by the governments of these regions has translated to positive impacts on their real economic growth outputs. (Joaquín, et al., 2021; David and Stephanie, 2019; Kangjuan, et al., 2017 and Epha, 2016)

For example, in the later years of the 19th and 20th centuries, the American government understood the key role that research plays in the development of the agricultural sector in their economy and that stirred the need for them to establish the public sector agricultural research and development Institute in 1862 and the International Food Policy Research Institute (IFPRI) in 1975 respectively. Since then, have provided evidence-based policy solutions for the sustainable food supply, and assist in fighting hunger, malnutrition, and reduced poverty (FAO, 2017). While in Asia, available information revealed that China[1] with 35 percent of her labour force in agriculture (425million agricultural farmers), can feed 22 percent of the world's population based on her different agricultural produce and products which are outcomes of her modern research, technology and good

[1] Agriculture is a major source of income to most Chinese, as it was stated by Lauren Keane in the Washington Post, "China has a long-standing policy of food – self–sufficiency, growing about 95% of the grains required to feed its people".

management of key macroeconomic variables. These conscious actions by the Chinese government consequently produced great improvement in her economic growth and development. (*America Farm Bill, 2019)*.

In terms of human capital development, key sectors like health, education, and power supply, are upheld in high esteem in the European continent relative to developing countries. This is evidenced by the 2019 World Happiness Report (WHR)[2] which has the first four happiest, less inequality and most peaceful countries (Finland, Denmark, Norway, and Iceland) in the world to be from Europe. These countries achieved these feats because they had formulated good policies for their health, education, and power sector, with high fiscal discipline ethics thus, minimizing their cost of living, bridging the inequality gap, and boosting their life expectancy (World Happiness Index, 2019). When these are juxtaposed with African countries, we realised that there are lots of policy failures, poor fiscal discipline, and inconsistency in policy implementation with a common pilfering attitude by government officials. The United Nations via the Millennium Development Goals(MDGs) campaign acknowledged education and health services as the key sectors that can expedite any country's economic growth, while others (Stern et al., 2019; FAO, 2017; Yusuf, 2014; and Adeyemi and Ayomide, 2013) argued that agriculture and power supply are key to the economic growth of the least developed nations.

In Nigeria, the 2020 Central Bank(CBN) statistical reports showed that for the past two decades (1999-2020), average public investments in these sectors (Agriculture, Education, and Health) when matched with the Real Gross Domestic Product(RGDP) that the country realizes annually has never exceeded 6% of its Real Gross Domestic Products(RGDP), and despite the inadequate funds allocated to these sectors; the health sector has returned releases of over N70bn between 2009 to 2018 due to late government approvals and poor fiscal discipline (CBN, 2020 and DRPC, 2020). While the agricultural sector has lost over 50% of its outputs to post-harvest storage as reported in 2022 by the Nigerian Stored Products Research Institute. When all these are juxtaposed with what other developed countries are experiencing, big disparity sets in, in the way these sectors are managed in the country, and as such poses some questions like: **a.** What are the magnitudes of the contributions of each of these sectors (Agriculture, Education, Health and Power supply) toward the economic growth of Nigeria from 1981-2020? **b.** Which of these sectors most contributes to Nigeria's real economic growth? and **c.** What are the practical policies that the government can implement to support the performing and non-performing sectors? These among other objectives formed the motivation for this study. To achieve these, the study is structured in five sections: General introduction; literature review, methodology; estimation and findings; and summary, conclusion, and policy recommendations.

II. Literature Review

2.1 Conceptual Literature:

Harris and Fuller (2014) conceptualized agriculture as *practices that involve crop planting and harvesting and domestication of animals to sustain the global human population by providing food and other products*. This definition of agriculture entails three sub-sectors, namely food, animals, and other products that are produce for man's use. In Nigeria, the agricultural sector is shared into four sub-sectors namely; crop production, fishery, forestry, and livestock production (CBN, 2020). When these sectors' outputs are put together and monetized, it's called Agricultural Outputs. This is annually stated in the CBN annual Statistical bulletin. In Nigeria, agriculture and its output have been a major source of living for over 60% of its populace due to its crucial roles that are inevitable for the survival of any society (Pius & Abel, 2015 and Olarinde & Abdullahi, 2014).

Education, on the other hand, is viewed and understood differently by different people, communities, and societies globally. This is because it connotes different things to different people. Thus, there is no generally accepted definition of education worldwide. The main essence of education in any economy is that it does not only help to supply the essential human capital which is a necessary condition for sustainable economic growth but aids reduce poverty, and promote equity and social justice (Todaro, 2007). However, in Nigeria, Uwadia, (2010) asserts that *Education in a broad sense is a process by which an individual acquires the many physical and social capabilities demanded by the society in which he/she is born to function*. The public investment in education is the amount of money that the government supports the sector which is measured annually and published in the CBN annual statistical bulletin (CBN, 2020).

The concept of health has long ago been discussed in different contextual environments and times. Thus, in trying to review this concept, history has it that the concept of health started when man began to balance his body and soul with the environment and against diseases. This concept was upheld by the philosopher Plato (429-347 BC) in his discussion " Dialogue." Where he maintained that "a perfect human society could be achieved by harmonizing the interests of the people and their environs; he asserted that the ideal of ancient Greek citizens was to have "a healthy mind in a healthy body" which can be achieved if people established internal harmony and harmony with the physical and the social environment." This was maintained throughout the Ancient Greece era, which was perverse through the ancient Indian and Chinese ages (Anna, Doncho, Nina, and Srećko, 2017). Nowadays, the concept of health focuses on issues that cover, morbidity(the rate at which diseases occur), mortality rate, and life expectancy. This broadens the scope with which health was earlier perceived in the world. The modern understanding of health became very official in 1948 when the World Health Organization (WHO), came up with its definition in

[2] The World Happiness Report is an annual report that presents the global findings using the Gallup World Poll Surveys. Nigeria is ranked 85 out of 156 countries in 2019.

its Constitution. The definition was propose by Dr Andrija Štampar one of the founders of the WHO. The Organisation defines health as the "*state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity*" (World Health Organization Constitution, 2006).

For power supply, it is the quantum of electricity that the electricity industry supplies to a particular group of people for domestic or industrial purposes. The industry is one of the basic and significant industries of the national economy, which is closely related to economic development (Adeyemi and Ayomide, 2013 Sun, Wang & Ma, 2009). On the one hand, the power supply is a propelling force of economic development. Its shortage can seriously affect the healthy development of the economy and can cause large economic losses (Stern, et al., 2019; Adeyemi and Ayomide, 2013).

2.2 Theoretical Literature

Several theories related to economic growth were reviewed, though, some of these theories have different views about the linkages that exist within these sectors and how they impact the economic growth of any economy. From the literature, we found that the Cobb-Douglas production function which is one of the oldest but most renowned production theories is suitable for this study. Besides, studies like Arikpo, Eke, and Obafemi, (2019), Oyetade, Shri, and AbdulRazak, (2016); Pius and Abel (2015) among others have employed this theory in their studies which makes clarity on their findings. From the previous studies, the researchers also deduced that since economic growth is obtained from the outcome of human production activities which are viewed to be efficiently implemented within an economy, there is a need for a good and favourable combination of Macro-inputs from other economic sectors to make it yield the maximum output and positively affect the lives of the people. Further, the theory was adapted and employed in a macro study through what is known as the "Aggregate Production theory" and it was considered valid. Thus, it is used in some macro studies based on how the variables are employed and observed within a given model. (Sloman and Wride, 2009; Koutsoyiannis,1979).

2.3 Empirical Literature

Bayati, Akbarian, & Kavosi, Z. (2013) using GDP per capita, health expenditure, food production index, employment ratio, education index, measles immunization coverage rate, urbanization, and carbon dioxide emission as explanatory variables, explored the determinants of life expectancy in the Eastern Mediterranean Region (EMR). Estimating a Health Production Function using a fixed-effect model and panel data for 21 EMR countries, their findings showed that GDP per capita, food availability, employment ratio, education, and urbanization had a positive effect on life expectancy, while health expenditure, measles, immunization coverage rate, and carbon dioxide emission showed no significant relationship with life expectancy.

Agheli and Emamgholipour, (2015) in their empirical study, explored the factors affecting the production of health (life expectancy) in Iran. They used per capita income, immunization rate, and share of expenditure on education (as a percent of GDP) as explanatory variables. Following the estimation of their model using the Johansen-Juselius cointegration and error correction model, their result showed that all the explanatory variables included in the model had a positive and significant effect on life expectancy with immunization having the largest magnitude of the effect. Anthonia, (2012) investigated the impact of primary and secondary school education on economic growth in Nigeria using a Comparative Analytical Approach with annual time series data ranging from 1985 to 2007. The findings show that only recurrent expenditure has significant effects on economic growth in Nigeria.

On the other hand, Salami et, al. 2017 empirically examined the relationship between health and education expenditure on economic growth in Nigeria between 1917 and 2013. The study adopted the OLS to determine the relationship between health and education expenditure on economic growth in Nigeria. They found out that capital expenditure and recurrent expenditure showed a negative impact on the economy. While Aigbenedion, Iyakwari, and Gyang, 2017 empirically examined the impact of the education sector on economic growth in Nigeria using time series data and an ordinary least squares (OLS) estimation technique in investigating the impact and relationships among the economic variables, a multiple regression model was used. The results revealed that the education sector has a positive impact on economic growth in Nigeria. This implies that economic growth can be improved by increasing education investment. But Government expenditure on education is negatively related to the Real Gross Domestic Product in Nigeria thus negatively affecting the growth rate.

2.3.1 Gaps in the literature

Most studies (Arikpo, et al., 2019; Aigbenedion, et al., 2017; Oyetade, Shri, and AbdulRazak 2016; Pius and Abel 2015; Adeyemi and Ayomide, 2013; among others), approach this problem using different time series data, variables, and techniques. In terms of data and techniques, most studies consider annual and panel time-series data. With few taking incognizance quarterly data. This study uses both quarterly and semi-annual data. The choice for the use of quarterly and semi-annual data is because annual data do not give a suitable account of lead/lag relationships; furthermore, quarterly and semi-annual data give a quick reaction to level shifts and changes in trends more than annual data since it is modelled quarterly and semi-annually (Tom, 2018).

While for techniques, most previous studies do employ the OLS, VAR, Johansen cointegration, and VECM with few studies employing the Computable General Equilibrium and Fully Modified OLS. None to the best of the researcher's knowledge has considered employing the DOLS technique by Stock and Watson, 1993; which gives a higher order of integration as opposed to OLS and VAR, is suitable for determining long-run relationships and elasticities among variables, produces reliable estimates for small and medium sample size and provides a check for robustness. The DOLS model is based on Monte Carlo simulation which opined that the DOLS estimation is superior in smaller and medium samples as compared to other alternative estimators (Masih, 1996). It also produces robust results, correcting for regressors' endogeneity and serial correlation which is the major criticism of the single equation method. Besides, the method takes account of

the lead and lags of regressors and has asymptotic optimality properties like the Johansen procedure (Stock and Watson, 1993).

III. Methodology

3.1 Estimated Model Specification

Adopting the Cobb-Douglas production function which is the framework for our analysis, we have $Yt = F(Kt, Lt)$ …. (general form) **3.1**

Where **Y** is the endogenous variable representing the outcome of the combination of K(capital) and L(labour) at time "t." Adapting equation 3.1 like some studies (Simon, 2020; and Arikpo, Eke and Obafemi, 2019; among others) did to achieve their objectives, by incorporating variables like real agricultural output, public spending on education, health and power supply; instead of the usual capital and labour, thus, equation 3.2 was augmented and expressed as:

Yt = F (Kt, Lt, RAGDPt , EDUEXPt , EGASt , HHSSt) 3.2

This was done to determine their impacts on the real economic growth of Nigeria. Where **Y** is the GDP growth rate (a proxy for economic growth), RAGDP, represents Real Agricultural Output, while **EDUEXP, EGAS** and **HHSS** represent public spending on Education, Electricity and Gas and Human Health Services. Hence, when capital and labour variables are omitted from the model to examine the variables of interest, the model becomes:

Yt = F (RAGDPt , EDUEXPt , EGASt , HHSSt) 3.3

Which is symbolically stated in stochastic form as:

GDPGRt = β 0 + β1LRAGDPt + β 2 LEDUEXPt + β 3 LEGASt + β 4 LHHSSt + μt 3.4

3.2 Estimation Techniques:

To achieve the objective of the study, we employed these lines of estimations: First, the stationarity test- by Phillip and Perron (PP) (1988) was conducted to determine the degree of integration of each variable, followed by the Johansen cointegration test by Johansen (1991) to determine the existence of a long-run relationship in the model and lastly the Dynamic Ordinary Least Squares by Stock and Watson (1993) was employed to examine the magnitude of the long-run impact (elasticities) of each independent variable on the dependent variable. All estimations were done using E-Views 11 statistical tool.

3.5. A-priori Expectation

We expect from this study that all the variables should have a positive impact on the dependent variables. Hence, the signs of the variables' coefficients are expected to take the form: ß1> 0, ß2> 0, ß3> 0 and ß4 >0.

3.4 Sources Of Data:

This study used quarterly data covering $1981Q_1 – 2020Q_4$. The sources of the data sets are presented in table 3.5 below. The choice of the period was dictated by the availability of data and the NBS Real GDP rebasing of 2010 constant prices which started from 1981. Hence, table 3.5 contains the variables' definition, description, measurement and sources of the data used in carrying out the analyses in this study.

Table 3.5. Variables Definition, Description, Measurement and Sources.

S / N	VARIABLE'S DEFINITION	VARIABLE DESCRIPTION	VARIABLE MEASUREMENT	SOURCE
1	**RGDPGR**	Real GDP Growth Rate	Relative Value in percentages	2020 CBN Annual Statistical Bulletin.
2	**LRAGDP**	Real GDP Agricultural Outputs	Nominal Value in Million Naira	2020 CBN Annual Statistical Bulletin.
3	**LEDUEXP**	Expenditure on Education	Nominal Value in Million Naira	2020 CBN Annual Statistical Bulletin.
4	**LHHSS**	Expenditure on Human Health Services	Nominal Value in Million Naira	2020 CBN Annual Statistical Bulletin.
5	**LEGAS**	Expenditure on Electricity and Gas Supply	Nominal Value in Million Naira	2020 CBN Annual Statistical Bulletin.

Source: *Author's Initiative., 2022.*

IV. Results, Discussions and Findings

This section is created to analyze the time series used for this study such that it will reflect two objectives (1 and 2), conduct the preliminary test, present the estimation results, trace the impacts and analyze the variables of concern from the estimation results.

Descriptive Statistics of all the variables from $1981Q_1$ to $2020Q_4$.

From Table 4.1, the Jarque-Bera test values are used to determine the normality test of the series' residuals. Thus, all the variables are normally distributed at a 5% level of significance since all the Jarque-Bera probability value is less than 0.05 level of significance as shown in the table. Hence, we fail to reject the null hypotheses that the residuals are normally distributed (Jarque and Bera, 1987)

Table 4.1 Descriptive Statistics of all the variables from 1981Q$_1$ to 2020Q$_4$.

	GDPGR	RAGDP	EDU	HHSS	EGAS
Mean	3.422935	8216517.	630149.7	235588.7	108813.0
Median	3.468975	4932757.	353002.6	158730.5	48815.10
Maximum	14.60438	18348176	1519660.	484736.9	328764.4
Minimum	-13.13000	2303505.	242555.9	113464.7	5117.648
Std. Dev.	5.478513	5477976.	457538.4	136451.5	114310.0
Skewness	-0.886041	0.533492	1.011886	0.881016	0.523410
Kurtosis	4.453011	1.733248	2.373729	2.103049	1.690854
Jarque-Bera	35.01011	18.28743	29.91914	26.06184	18.73129
Probability	0.000000	0.000107	0.000000	0.000002	0.000086
Sum Sq. Dev.	4772.243	4.77E+15	3.33E+13	2.96E+12	2.08E+12
Observations	160	160	160	160	160

Source: *Author Computation using E-views 11.*

Stationarity Test for Unit Roots:

Table. 4.2 Unit Root Table for all the variables.

Phillip-Perron (PP) Levels			**Phillip-Perron (PP) First Difference**		
Variable	**Intercept and Trend (test Statistics)**	**Prob.**	**Variable**	**Intercept and Trend (test Statistics)**	**Prob.**
GDPGR(Y)	-2.888862	0.1690	***GDPGR(Y)***	-13.92922	0.0000
LRAGDP	-2.114003	0.5337	***LRAGDP***	-13.77725	0.0000
LEDUEXP	-1.620628	0.7807	***LEDUEXP***	-13.69303	0.0000
LHHSS	-1.685645	0.7533	***LHHSS***	-14.39108	0.0000
LEGAS	-2.000896	0.5960	***LEGAS***	-12.62133	0.0000

Source: *Author Computation.* * *Significant at 1%.* ** *significant at 5%*

In table 4.2, all the variables were integrated in the same order i.e. I(1) after they are subjected to a Philip Perron (PP) unit root test. This implies that all the variables were non-stationary at level, but were all stationary after first differencing. The PP test was used because it corrects for serial correlation and heteroscedasticity in the errors(ε_t) in a non-parametrical manner by modifying the Dickey-Fuller t-statistics unlike the Augmented Dickey-Fuller test (ADF) which does not. (Phillip and Perron, 1988).

Cointegration Test for Long-run relationship and DOLS for long-run coefficients for equations 3.4.

Table 4.3a.showed the suitable lag length criteria of 4, which was used for the estimation of the cointegration test.

Table 4.3a Lag Length Criteria.

Lag	AIC	SC	HQ
0	-7.509686	-7.409776	-7.469098
1	-8.924303	-8.324844	-8.680772
2	-8.732242	-7.633233	-8.285767
3	-8.765878	-7.167320	-8.116461
4	**-11.19907***	**-9.100960***	**-10.34671***
5	-11.10180	-8.504138	-10.04649
6	-10.81600	-7.718790	-9.557751
7	-10.55387	-6.957116	-9.092684
8	-11.07155	-6.975246	-9.407421

Source: 2022 Author's Computation, using E-Views 11.

4.3b. Cointegration test for equation 3.4

Table 4.3b contains the results for the cointegration tests; which suggest there is a long-run relationship existing among the variables for the model (equation 3.4) evidenced by the trace statistics.

4.3b. Cointegration test for equation 3.4

No. of Block	*Trace*				*Max-Eigen Value*			
Hypothesized No. Cointegration. Equation.	***Trace statistic Value***	***0.05 Critical value***	***prob.***	***No. of Coint. Equation***	***Max-Eigen statistics Value***	***0.05 Critical value***	***prob.***	***No. of Coint. Equation***
None*	182.5164	69.81889	0.0000	5	96.37347*	33.87687	0.0000	*5*
At most 1*	86.14294	47.85613	0.0000		37.67775*	27.58434	0.0018	
At most 2*	48.46519	29.79707	0.0001		25.74125*	21.13162	0.0104	
At most 3*	22.72393	15.49471	0.0034		15.78938*	14.26460	0.0285	
At most 4*	6.934551	3.841466	0.0085		6.934551*	3.841466	0.0085	
** denotes rejection of the hypothesis at the 0.05 level*				***Source:*** *Author's Computation.*				

Dynamic Ordinary Least Squares (DOLS).

Having established the existence of a long-run relationship among the variables from the two equations, the DOLS estimation was then employed to determine the magnitude of the impact that each exogenous variable has against the endogenous variable for the two equations in the long run. Considering all the variables of interest, the DOLS result (Table 4.3c) suggests that the coefficient of real agricultural output and public funding on education over the period under review have a positive impact, however, its only real agricultural output that has a significant impact on the dependent variable (real GDP growth rate). The result further reveals that real agricultural output contributes more (17.21) to Nigeria's real GDP growth rate than any other variable in the model

Table 4.3c Dynamic OLS result for Equation 3.4 (the period between 1981Q1 to 2020Q4):

VARIABLES	***Dependent Variable:*** *Y (Real GDP Growth Rate)*		
	Coefficient	***t-Statistic***	***Prob.***
Constant	-31.93093	-0.621067	0.5356
LRAGDP	17.21273	2.862040	0.0049
LEDUEXP	4.010024	0.259672	0.7955
LHHSS	-22.69634	-1.159396	0.2483
LEGAS	-1.008868	-0.702346	0.4836
R-squared	*0.52416*		
Adjusted R- Squared	*0.469783*		

Source: *Author Computation. * Significant at 1%. ** significant at 5%*

This implies that ceteris paribus any 1% increase in real agricultural output agriculture can cause a 17.21 unit increase in the real economic growth rate in Nigeria. Contrastingly, the result revealed electricity and human health services negatively affect the dependent variable, with the most negative being funding for human health(-22.70). This is based on the imprudent spending and pilfering attitude of public office holders that are very common in most of the sectors of the economy, misallocation and/or diversion of public drugs and vaccines to private hospitals and clinics which are later sold at higher prices; also delay and/or deferment in the release of funds leading to poor fiscal discipline and return of un-utilized funds as it was done in the health sector as over N70bn was returned between 2009 to 2018 to federation account because of late release of funds and poor fiscal discipline(DRPC, 2020). In addition, poor storage equipment such as good vaccine storage (refrigerators/ vaccine boxes, etc.) and standard stores for drug storage are lacking in most communities' PHCs in the country which also exacerbated to quick expiration of vaccines and drugs leading to a huge waste of drugs via-a-vis funds. Thus, not reaching the end-users.

Similarly, the negative impact of electricity and gas funding in the country on the real economic growth rate as revealed in the model is a result of the huge money that was employed for the services of foreign experts to fix the electricity but was fruitless, instead, the projects that were implemented were of trivial life spam, and the monies given are taken out of the country by these experts. Furthermore, most standard companies in compact industrial areas and even some public offices in the country depend little on the public supply of electricity and gas due to the shortage and unreliability of the power supply. Thus, most of them preferred importing high voltage diesel generators and other power generating devices for light stability which further contributes to more demand for foreign currency and invariably depreciates the local currency and affects the economic growth negatively. It is also worth noting that there are various incomplete electricity and gas projects (Mambila hydro-station) projects in Nigeria that had drained a large portion of the public funds without good results consequently, becoming liabilities to the nation.

Thus, all these contribute negatively to economic growth over the period under review. These outcomes corroborate with previous studies like Adewolokan, (2016) and Salami et al. (2017) as they pointed out that the reason for the negative impact of public health funding on Nigeria's economic growth may be a result of so many degenerating health facilities in Nigeria that require maintenance rather than the establishment of new ones.

V. Summary, Conclusion and Recommendations

The study seeks to determine the impact of real agricultural output, human capital and power supply on Nigeria's real economic growth from 1981 to 2020. From the estimated Johansen cointegration result, there exists a long-run relationship within the model (real GDP growth rate, real agricultural output, human capital and power supply). While from the estimated DOLS result, agricultural output has been the key sector contributing the highest to economic growth in the country. However, public spending on health and electricity has not significantly contributed to real economic growth in the economy. Thus, the study concludes that real agricultural output has yielded a positive and significant impact on economic growth, whereas spending on human health and electricity and gas is yet to impact positively on the economy's growth. Based on these empirical findings, the study recommends that the responsible policymakers for the health and electricity sectors should intensify the need for more public funding, and proper monitoring of the allocated funds should be done so that the funds allocated to these sectors can be prudently utilized and accounted for. More funding and technical support from the public, private partners and non-governmental organisations should be given to agriculture and education since these sectors have more comparative advantage in boosting the real economic growth of the country compared to other sectors that were considered in the study. Also, a better policy framework for the Nigerian agricultural sector through the ministry of agriculture and adequate infrastructure should be strictly enacted where each crop will have an allocated amount of money that can be kept to support farmers who may need financial assistance and credit facilities.

Output target on crops which are allocated money from farmers can be given. If the target is met, the government should buy the excess produce. This will encourage farmers to produce more such crops in the following year. Again, more infrastructure such as good roads, markets and storage facilities should be provided or raised for farmers to find ease of transportation, store their produce and help reduce post-harvest loss. These will ameliorate the wastage of food in the producing areas.

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