ECONOMIC GROWTH, OIL RENT AND AGRICULTURAL VALUE-ADDED NEXUS IN NIGERIA: AN EMPIRICAL EVIDENCE

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ABSTRACT
Agriculture is known as the engine and panacea for economic growth in most developing nations of the world. The objective of this study is to investigate the direction of causality among economic growth, oil rent and agriculture value-added in Nigeria. In addition, analyzing the interrelationship between economic growth and agriculture added value. The data used is time-series data in the period 1970-2020 obtained from world development indicators from the World Bank database. The analytical approach used is causality with the vector error correction model **(**VECM) and Granger Causality test. The finding of this study, in the agricultural added value equation indicates the validity of the long and short-term equilibrium relationship between variables, there is long and short-term causality in the direction of economic growth, oil rent on agriculture added value.

Keywords: Agriculture, Economic growth, Granger Causality, Vector error correction model (VECM).
JEL Classification: J43, Q1

1. INTRODUCTION
Agriculture is the bedrock for economic growth, development and poverty eradication in developing countries. Agriculture has also been regarded as the engine and panacea to economic prosperity. In the words of Gunner Myrdal (1984), "The battle for long-term economic growth will be won or lost in the agricultural sector". However, how this path leads to economic prosperity is still subject to debate among development specialists and economists. In the 1950s and 1960s in Nigeria, agriculture was the leading sector in terms of contribution to the gross domestic product, accounting for approximately 64% of output as well as employing over 73% of the total labour force. It was the major foreign exchange earner used to pay for imported capital manufactured goods (Ighodaro, 2010). However, the discovery of crude oil in commercial quantity brought about a reduction in the agricultural share of gross domestic product from almost 64% in 1960 to about 49% in 1969. Between 1980 and 1989 it fell to an average of 33.4%. Agriculture's contribution to the gross domestic product between 1990 and 1997 averaged 29.34% (Iyoha, 2003). Agriculture share later increased to 40% in 1998 and declined to 27% in 2000. Between 2000 and 2009 the percentage contribution of the agricultural sector to GDP declined to an

average of 28.5% with a persistent reduction of 21.6% from 2010 to 2016. Agriculture contributed to almost 22.03 percent of the total GDP between 2017 and 2020, with an increase of about four percentage points compared to the previous period (Central Bank of Nigeria, 2020). Agriculture is still the main source of livelihood for most Nigerian and remains the foundation of the Nigerian economy, despite the presence of oil in the country. The agricultural sector is made up of four sub-sectors: Crop Production, Livestock, Forestry and Fishing.

Before 2015, real GDP growth in Nigeria compared favourably with the emerging Asian countries, notably, Thailand, Malaysia, China, India and Indonesia which were far behind Nigeria in terms of GDP per capita in 1970, these countries have transformed their economies and are not only miles ahead of Nigeria, but are also major players on the global economic arena. Indeed, Nigeria's poor economic performance, particularly in the last forty years, is better illustrated when compared with China which now occupies an enviable position as the second-largest economy in the world. Between 2013 and 2014, growth in Nigeria averaged 6 per cent but fell to 2.7 per cent in 2015 and -1.6 per cent in 2016 when Nigeria experienced its first full year of recession in 25 years (World Bank, 2017). Even with the recovery in 2017, Nigeria's growth is yet to meet up with its peers as the impact of direct government interventions in the sector could not robustly counteract the accompanying effects which have led to the destruction of agricultural farmlands, insecurity, disrupted economic activity, and poor food security.

Nigeria is facing an imminent food security crisis, increasing poverty levels, and high unemployment with a growing population, which depends mainly on imported food (Ikenwa et al., 2017; Olomola &Nwafor, 2018). The dominance of subsistence farming over large-scale farming in Nigeria may be traced to problems such as high lending rates, inadequate access to fertilizers, poor storage facilities, poor farmers' education and or extension services, and weak institutional framework. (Anumudu Ugwuanyi, Asogwa & Ogbuakanne, 2018). Despite Nigeria's significant resource endowments, there is a negative economic growth rate; poverty and insurgency remain widespread.

The GDP in 2017 stood at 0.8% which later rose to 2.2 % in 2019 and further declined to 1.92% in 2020 as a result of the downward trend in global economic activities as a result of the COVID-19 pandemic. The second quarter of 2021 recorded a slight recovery, but the country's economic growth is yet to match up with its peers as the impact of direct government intervention in the agricultural sector failed to significantly counteract the effects that led to insecurity, poor infrastructure, and destruction of road networks, disrupted economic activities, and poor economic performance through economic growth (Central Bank of Nigeria, 2021).

Gardner (2003) considers the sources and constraints on agricultural growth in his paper, he investigates the relationship between the growth in agricultural value-added per worker and GDP per capita for 52 developing countries. He provides evidence of a positive relationship between these growth rates and poses the question: "What is the direction of causality?" There is substantial literature that provides conflicting evidence in answering the question. For example, some suggest that the export of surplus resources from agriculture leads to agriculture driving economic growth. Others suggest that increases in the nonagricultural wage lead to relocation and increases in agricultural productivity thereby implying that causality runs from general economic growth to agriculture. Gardner (2003) also provides limited information concerning the methods used to answer this question, however, it is concluded that an "investigation of lags.does not show agriculture

as leading." In this article, we aim to further investigate the question posed by Gardner using the data to analyze. Our analysis employs the Vector Error Correction and the Granger causality test and as such complements the work by Gemmell et al. (2000) by applying a similar approach to a country-specific.

Nevertheless, some authors while accepting this argument conclude that, in an open economy, the linkages between agriculture and nonagricultural are less important than in a more closed economy (Dercon 2009, Gollin 2010). They argue that in an open economy, importing food and focusing efforts on other sectors might be more beneficial to the country's development if it is difficult to increase agricultural productivity. Schiff and Valdez (1998) report that most of the early development strategies, advocated by Rosenstein-Rodan, Nurkse, and Hirshman among others, emphasize industrial development as the main source of economic growth. They were biased against the agricultural sector. In addition, Moon (2011) writes about the 'Washington Consensus' as having preached to Sub-Sahara African leaders to focus on industrialization along with privatization and deregulation at the expense of agricultural development. This is a manifestation of mainstream development thinking before the 2000s.
Imposed by the donor countries, the International Monetary Fund (IMF), and the World Bank, this strategy left Sub-Sahara African agriculture to lag farther behind the rest of the world.
However, Pingali (2012) reports that the canonical role of agriculture in economic development is being re-discovered by the developing country policymakers as well as managers of foreign assistance in the Organization for Economic Cooperation Development (OECD) countries and multi-lateral agencies. He further coinsthe expression "agriculture renaissance" and defines it as the renewed understanding and recommitment to the fundamental role of agriculture in the development process.
Given the differing views in the literature, the role of agriculture in the development process must be reevaluated based on the specific economic environment of a country.
Therefore, the research question that the study attempts to provide the answer to is: is agriculture significantly impact Nigeria's economy? And, what is the direction of causality among economic growth, oil rent and agriculture value-added?

This paper is structured into five sections. Section two reviews the empirical literature and section three discusses the methodology, model specification, vector error correction and Granger causality approach. Section four presents the analysis and interpretation of empirical results. Section five summarizes and presents the concluding remarks.

2. LITERATURE REVIEW

2.1 Conceptual Literature

In the theories of economic development advocated by Lewis (1954), rapid industrial growth is fueled by the agricultural sector. He saw agriculture as freeing disguised labour for industrial production and hence the engine of growth and development of any society must start with agricultural production. Schultz (1964) argued that many poor countries are in a situation of "high food drain," in which they have "a level of income so low that a critically large proportion of the income is required for food." In his view, agriculture is important for economic growth in the sense that it guarantees subsistence for a society without which growth is not possible in the first place. When countries can meet their subsistence needs, economic growth will emerge.

As agricultural productivity increases, rural income increases thus creating demand for domestically produced industrial products. As emphasized by Lewis (1954) in his report on industrialization in the Gold Coast, increased rural purchasing power is a valuable stimulus to industrial development. The lack of purchasing power of the rural poor, who comprised the majority of the population, displayed low productivity in agriculture. Hence, with lack of increased agricultural productivity, there would be no sufficient market for agricultural goods (Nurkse, 1959).

The value of production and consumption linkages is exemplified by Adelman (1984) through his idea of agricultural demand led industrialization (ADLI). The author advocates a development strategy driven by agriculture rather than exports because of these linkages. Increased agricultural productivity should be the initiator of industrialization. He added that emphasis should be placed on small-to-medium-size farmers because they are more likely to use domestically produced intermediate goods as opposed to large-scale producers who might import machinery and other inputs, which would weaken the linkages between agriculture and other sectors.

2.2 Theoretical Literature

Over the years, the agro-pessimists have remained doubtful about the established role of agriculture in economic development andput forward several arguments. For instance, Gollin (2010) pointed out that the large share of agriculture in many developing economies does not immediately imply that overall growth has to be based on an ADLI-type strategy. Dercon (2009) believes in the possibility that the causation might run from economic to agricultural growth. If agriculture is not the most productive in the entire economy, e.g. it has no comparative advantage, supporting it is not the best route to economic progress. Growth may be driven by the other sectors of the economy that provide people with the prospect of leaving the marginalized farm. Hence, this type of economy is better off exporting nonagricultural goods and importing food than relying on agriculture-led industrialization.

With lower productivity in agriculture, wages will be higher in the modern sector, which induces labour to move out of agricultureinto the modern sector, which in turn generates economic growth.

Collier (2006), suggests “urban dynamism” as being the key to solving agriculture’s problems. He is against the idea of a smallholder agricultural development strategy. He notes that though the poor earn their livings from smallholder systems, there is little evidence that productivity can increase sufficiently within these systems to generate growth. He then proposes that a country’s development efforts should be directed at large-scale commercial farms and the non-agriculture sector, for these could ultimately provide increased livelihood opportunities for the poor.

There are several other arguments put forward by the agro-pessimists. For instance, they contend that increasing agricultural productivity is becoming difficult, as the natural resource base on which agriculture depends is poor and deteriorating. Skeptics also consider the East Asian miracle as concrete evidence of the case where growth is achieved without the broad agriculture-based development. For the Korean economy, Amsden (1989) conclude that industrialization is achieved without any preceding agricultural revolution.

2.3 Empirical literature

In history, Aristotle, Aristarchus and Warren Anderson and many others provide us with a frame that, agriculture is the key to the growth and development of any nation. The

Physiocrats in their ideology believe that agriculture is the sole engine that drives any economy to her promised land. That is, out of the poverty line and obscurity; these thinkers, the Physiocrats strongly have fate in the agricultural sector which serves as the propeller of an economy. In essence, the Physiocrats think that the productivity and prosperity of any nation either developed or less developed nation is hinged on the agricultural sector.
Given the importance of the agricultural sector to economic growth, especially in developing countries like Nigeria, some empirical studies have been carried out on agriculture and economic growth. The work of Ijirshar (2015) focused on analyzing the agricultural export and economic growth from 1970 to 2012. The co-integration test showed that a long-run relationship exists among the variables (real GDP, real exchange rate, real agricultural output, index of trade openness and inflation).The error correction method shows that agricultural export has contributed positively to the Nigerian economy. In the same vein, Odetola and Etunmu (2013) found that from 1960 to 2011, the agricultural sector has contributed positively and consistently to economic growth in Nigeria, reaffirming the sector's importance in the economy. It was further affirmed using the Granger causality test which showed that agriculture growth granger-causes GDP growth and a reverse relationship was found.

A study carried out by Oyetade and Oluwatoyese (2014) on the effect of the agricultural sector as the determinant of economic growth, using a time series econometric model from 1980 to 2011 covering 30 years. The study modelled several agriculture sector variables namely food/crop production, fishery and forestry, as the explanatory variables against the dependent variable, gross domestic product (GDP). The study revealed a positive relationship between the agricultural sector and economic growth. The study also discovered the agricultural sector as the determinant for exportation, if given due attention in all ramifications in terms of funding and providing the enabling environment for the key actors in the sector. The study also submitted that there are constraints to the full attainment of agricultural sector progress.

Aremu (2014) using a data set of 30 years, that is, from 1981 to 2012, investigated the role of agriculture in economic growth and development. He examined the role that the agricultural sector played in the advancement of the Nigerian economy, considering the years of neglect by the government and decision-makers. Aremu's research used econometrics to validate his hypothesis where he used the Solow growth model that included gross capital formation (GCF) as the proxy for capital, labour proxy by post-secondary enrollment, while agricultural output and economic growth and development as a proxy by real gross domestic product (RGDP). The restricted Error Correction Approach was employed for the long-run relationship. The study revealed that agriculture plays a remarkable role in the economic growth and development of Nigeria. From his findings, it was shown that the agricultural sector still contributed to gross domestic product, though, there has been a decline since the 1990"s explained by the arrival of the new bride (oil discovery) in the late 1970"s.

Ogundari and Awokuse (2016) went further to unequivocally support the role of improved agricultural productivity in reducing food insecurity, stating the major challenge in sub-Saharan Africa's (SSA) agricultural sector is sustained agricultural productivity. Fuglie and Rada (2013) argue for sustained agricultural productivity to be achieved, policy measures

that start with the dissemination of agricultural technologies and practices to farmers should be established and investment in research and development encouraged.

However, Desai and Rudra (2018) think that most developing countries are transitioning from traditional agriculture and moving up the value-added chain toward processed food. O'Ryani and Miller (2003) in an earlier study on the role of agriculture on poverty alleviation, income distribution, and economic development for the Chilean economy conclude that agriculture and agro-industrial sectors are essential to alleviate poverty. Furthermore, an increase in labour productivity in agriculture has a higher impact on the decline of poverty incidence than an increase in the industrial sector.

Ekiran et al. (2014) examined the relationship between agricultural export and economic growth in Nigeria usinga multivariate Johansen co-integration analysis, from 1980 to 2012. The findings from this research revealed that agricultural output has a long-run relationship with the is seen as a key driver of economic growth and development of the Nigerian economy. It was advocated that government should pay attention to agricultural export, as it serves as a stimulant for the much canvass economic expansion and development in the Nigerian.

Given that there have been several views on the topic, some of the researchers, (Okoro, 2011) find a positive causality that is, a positive relationship between the agricultural sector and the Nigerian economy while others (Dim, 2013) found contrary results from their study. Ahungwa et al., (2014) examined the impact of agriculture on GDP for 53 years, precisely between 1960 and 2012 using time series data. The finding from their work revealed that the agricultural sector's share of GDP experiences a decline. The agricultural sector still had a superior lead over other sectors, from 1960 to 1975.

3. METHODOLOGY

This research employs the use of the time series econometrics technique to validate the objectives of this study. The study spans 49 years, that is, 1971 to 2020. The sources of data are the World Bank development indicators and the Central Bank of Nigeria. The study employs the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests, to test for stationarity of all variables involved in the model to avoid a spurious regression analysis. It is a well-known fact that most macroeconomic data exhibit trends and seasonality. Johansen cointegration test is also carried out to test for the long-run relationship between variables considered, Granger Causality test and the VECM approach were utilized in the study to capture the possible disequilibrium in the short run and the speed of adjustment of the variables considered towards their long-run path.

3.1Theoretical Framework

This study is premised on the Solow-Swan neoclassical growth theory and its extensionsof a constant-return to scale aggregate production function expressed as:

$$Y_t = K_t L_t^{\beta} B_t \quad (1)$$

where Y, K, L, and B represent real GDP per capita, real gross capital, labour, and the Hicks-neutral productivity term, respectively. The contribution of agriculture to aggregate economic growth could be modelled as an intermediate input in the agriculture sector (Timmer, 1995; Ruttan, 2000). Early development theories viewed agriculture as an

important source of resources to finance the development of other sectors within the economy.

Thus, agricultural production growth serves as an engine of growth for the overall economy.
Hwa (1988) argues that agriculture is an engine of growth and added agriculture to the standard Solow-Swan growth equation as a measure of linkages between the rural and industrial sectors of the economy. Similarly, we also include additional determinants of growth (oil rent) that are robust in explaining economic growth (Davis, 1995; Maloney 2001).

$Y_t = L^{\beta} X_t^{\varphi}$ (2)

Taking natural logs of equation (2) and including an error term yield:

$\ln Yt = \beta \ln Lt + \varphi \ln Xt + \mu t$ (3)

According to the agricultural demand led industrialization growth literature, agricultural productivity is expected to have a positive effect on aggregate economic growth, while Paul Collier (2006), posits that oil rent is expected to have a positive effect on economic growth.

3.2Model Specification and Variables

To analyze the impact of the agricultural sector on the Nigerian economy's growth, twovariables are considered as the explanatory variables that were chosen based on previous empirical studies and economic intuition. These variables are agricultural output (Lt) and oil rent (Xt). Economic growth is measured by RGDP per capita (Y_t). The data obtained from the World Bank Development indicator (WDI), Span the period from 1970 to 2020. The formulation of the model is given below.

$Y_t = L^{\beta} X_t^{\varphi}$ (2)

The stochastic form of the model is as follows

$\ln Yt = \beta \ln Lt + \varphi \ln Xt + \mu t$ (3)

Where,

Y_t = Real Gross Domestic Product per capita

αo = intercept (constant),

L_t = Agricultural output (% GDP),

Xt = Oil rent (% GDP),

u_t = Stochastic term (unobserved).

A priori expectation : B, φ > 0

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Empirical Analysis

The first step is to conduct a unit root test for all the variables and test for the stationarity of the variables, which is a necessary condition for understanding the long-run behaviour of variables. In carrying out this test, the rule of thumb is that if the absolute value of ADF and PP test statistic is greater than McKinnon's critical value at 5%, we reject the null hypothesis that the variable is nonstationary. The variable is deemed stationary when the absolute value of the ADF and PP statistics test is greater than the critical value at 5%.

Table 1: *Augmented Dickey-Fuller (ADF) Unit Root Tests*

Variables	ADF @Level	Critical value@5%	ADF at first difference	Critical value@5%	Order of integration
Yt	-1.403361	-2.921175	-5.662821	-2.922449	1(1)
Lt	-2.579393	-2.921175	-6.727094	-2.922449	1(1)
Xt	-2.117749	-2.921175	-5.216472	-2.922449	1(1)

Source: Extract from E-view 9 output 2022

Table 2: *Phillips- Perron (PP) Unit Root Tests*

Variables	PP @Level	Critical value@5%	PP at first difference	Critical value@5%	Order of integration
Yt	-1.474037	-2.921175	-5.726944	-2.922449	1(1)
Lt	-2.6943389	-2.921175	-6.565435	-2.922449	1(1)
Xt	-2.093359	-2.921175	-5.129292	-2.922449	1(1)

Source: Extract from E-view 9 output 2022

From Tables 1 and 2, all the variables are nonstationary at levels. To make all variables stationary at the same level, the test is run on the first difference, thereby making all variables stationary at the order I(1). In absolute terms, the ADF and PP test statistics are greater than the critical value at 5%. Therefore, the variables are stationary at first difference. Co-integration requires all the variables to be integrated in the same order.

A Co-integration test using the Johansen technique is used to ascertain the long-run relationship between the dependent variable (Yt) and the independent variables (Lt, and Xt). The decision rule states that if the values of trace statistics or maximum Eigenvalue are greater than the critical values at 5%, then the null hypothesis of no co-integration is rejected, which suggests co-integration among variables, implying a long-run equilibrium relationship.

Table 3: *Johansen Co-integration Test Results*

Null Hypothesis	Eigenvalue	Trace statistic	Critical value at 5 percent	Max-Eigen statistic	Critical value at 5 percent
$\alpha = 0$	0.347760	36.53278*	29.79707	20.93979	21.13162
$\alpha \leq 1$	0.260198	14.59299	15.49471	14.76725*	14.26460
$\alpha \leq 2$	0.016711	0.825744	3.841466	0.825744	3.841466

Notes: *α Represents at most the number of cointegrating equations. * Denotes significance at the 5% level.*

Source: Authors' computations using E-view 9.0

From Table 3, we can see that under the hypothesized number of CE(s), at none*, the value of the trace statistic is greater than the critical value at 5%. Therefore, we concludethat there is one co-integrating equation, meaning there is a long-run relationship between the dependent variable and one co-integrating explanatory variable. Also, the maximum eigenvalue test, the Max-Eigen statistics at most 1 is greater than the critical value at 5%, thereby concluding that using the Max-Eigen test, there is a long-run relationship between the dependent variable and two co-integrating equations.

Table 4. The result of vector error correction model to long-run causality

	C	**(lnyt-1)**	**(lnlt-1)**	**(lnxt-1)**	**ECTt-1**	**Summary**
Δ(lny)	-0.0144 0.0117 (0.2252)	0.2939 0.1846 (0.1191)	0.0819 0.0519 (0.1222)	0.2284 0.2913 (0.4376)	-0.0144 0.0117 (0.2252)	R^2: 0.2527 Adj. R^2: 0.1219 F-stat: 1.93 Prob F-Stat☹0.089)
Δ(lnl)	0.0873 0.0662 (0.1945)	-1.0083 0.3681 (0.0092)**	0.1475 0.1034 (0.1616)	-1.2031 0.5809 (0.0449)*	-0.4712 0.0702 (0.0000)**	R^2: 0.6296 Adj. R^2: 0.5648 F-stat: 9.717 Prob F-Stat(:0.0001)**
Δ(lnx)	0.0019 0.0217 (0.9319)	-0.1279 0.1206 (0.2949)	-0.0274 0.0339 (0.4232)	-0.1691 0.1903 (0.3795)	-0.1249 0.0657 (0.0643)	R^2: 0.1749 Adj. R^2: 0.0305 F-stat: 1.2119 Prob F-Stat(:0.3188)

Source: Authors' computation using E-view 9.0.

From the cointegration results in Table 3, both max-Eigen and trace statistics reject the null hypothesis of no cointegration at the 5% level. Specifically, both statistics confirm the existence of a cointegrating equation among the variables, and the vector error correction model (VECM) can be applied.

Table 4, shows the VECM is sensitive to the selection of optimal lag length. Thus, the necessary lag length of agriculture added value (Lt), Oil rent (Xt) and economic growth (y) series is determined by Schwarz Information Criteria (SC), Akaike information criterion (AIC) and it reveals the optimal lag length of one for the model. Besides, the VECM result shows that the error correction term, ECT_{t-1}(0.4712) in the second model (i.e. L_t equation) is negative and statistically significant at a 1% level. This result conforms to the findings of Akiran *et al* 2014, which suggests the validity of the long-run equilibrium relationship between the variables. It also implies that 47.12% of disequilibrium from the previous period's shock converges back to the long-run equilibrium in the current period. In other words, there exists unidirectional long-run causality running from economic growth, oil rent to agriculture added value.

Meanwhile, the VECM results of (Y equation) showed that there is no long-run causality from agriculture added value (Lt) and oil rent (Xt) to economic growth. Similarly, the (Xt) equation showed that there is no presence of a long-run equilibrium relationship between agriculture added value, and economic growth on oil rent. This is evidenced by the value of ECT_{t-1}being insignificant in the model.

We tested whether the various lags of the independent variable can jointly influence the dependent variable or not. In other words, the short-run relation can also be tested among the dependent and past values of the independent variable jointly. It can be tested with the help of the Wald statistics test as presented in Table 5.

Table 5. The Result of Wald Tests to Short-run Causality

Dependent variable	**Δ(lnyt-1)**	**Δ(lnlt-1)**	**Δ(lnxt-1)**	**Inference (short-run causality)**
Δ(lny)	-	8.4055 (0.0150)*	0.3568 (0.6899)	Δ(lnLt) on Δ(lny): short-run causality
	-			Δ(lnx) on Δ(lny): no short-run causality
Δ(lnL)	3.9421 (0.0194)*	-	2.2307	Δ(lny) on Δ(lnL): short-run causality
		-	(0.1074)	Δ(lnx) on Δ(lnL):no short-run causality
Δ(lnx)	2.0240	0.7165	-	Δ(lny) on Δ(lnx):no short-run causality
	(0.1327)	(0.4884)	-	Δ(lnL) on Δ(lnx):no short-run causality

Source: Authors' computation using E-view 9.0.

The next is the hypothesis-null test at the short-run causality is that the past lags of the independent variable, i.e. agriculture added value, and oil rent cannot jointly influence the value of the dependent variable, i.e. economic growth. If the probability value of Chi square in the Wald Statistics is less than 0.05, the Null Hypothesis is rejected or vice versa.
The same process is repeated for testing the short-run relationship between past lags of the independent variable, i.e. economic growth, agriculture added value and the dependent variable, i.e. oil rent. Similarly, for testing the short-run between past lags of the independent variable, i.e. economic growth and oil rent and the dependent variable, i.e. agriculture added value.
From table 5, it is confirmed that there is no short-run relationship between economic growth and agriculture added value toward oil rent. However, the Wald statistics test shows that between agriculture added value and economic growth, there exists a short-run. The past lags of value-added agriculture jointly impact economic growth in the short run. There is no short-run between economic growths to oil rent. The past lags of agriculture added value impact the economic growth in the short run.

Table 6. The result of the Granger Causality Tests

Null Hypothesis:	Lag	F-Statistic	Prob
LT does not Granger Cause YT	1	6.53891	0.0138
YT does not Granger Cause LT	1	2.10241	0.1537
XT does not Granger Cause YT	1	5.07918	0.0289
YT does not Granger Cause XT	1	0.41283	0.5237
XT does not Granger Cause LT	1	1.14164	0.2908
LT does not Granger Cause XT	1	0.07281	0.7885

Source: Authors' computation using E-view 9.0.

To find out the causality between economic growth, oil rent, and agriculture added value, we used another alternative approach which is the Granger causality test.
From Table 6, the estimation result explains that the unidirectional relationship between agriculture added value toward economic growth at a significant level of 1%. It means an increase in the agriculture added value leads to economic growth increases. These results are well supported by the previous studies conducted by Aremu (2014); Ogunbadejo and Zubair (2021) and Okoro, (2011) but contrary to the view of agro-pessimist like Dercon (2009) who opined the possibilities of causation running from economic growth to agriculture value-added. Specifically, the null hypothesis that agriculture does not granger-cause economic growth could be rejected at the 5% level for this study. This result is consistent with previous findings for developing countries by Tiffin and Irz (2006) who also concluded that agriculture value-added 'Granger Cause' economic growth. This finding may reflect the so-called 'Dutch Disease' where resources from the agriculture sector were siphoned to the industrial sector (Fardmanesh,1991).
Similarly, the relationship between oil rent and economic growth is unidirectional, where oil rent increase will increase economic growth at a significant level of 5%. These findings

were also in line with the result of the studies by Fulnhas et al (2015), Matallah and Matallah (2016) and David and Emmanuel (2020).

5. CONCLUSION AND POLICY RECOMMENDATIONS

The primary aim of this study is to investigate the relationship between agriculture and economic growth and to enable policymakers to understand the linkage that facilitates the direction of investment and policy implementation.

This study empirically examined the contribution of the agricultural sector to economic growth in Nigeria. The study also queries if there exists a long-run relationship among the variables in the study. Before the establishment of a long-run relationship, the stationarity properties were also tested with the conventional unit root testing approaches of ADF and PP to aid our regression analysis.

The empirical analysis employed a co-integration and Johansen error correction specification on a time series data for economic variables, which includes agriculture value-added, oil rent and economic growth from the period 1970 to 2020 to explain the variation in agricultural output. Results from the Granger causality test indicate a unidirectional relationship between agriculture and economic growth which implies no backward and forward linkages in the input-output interface.

This study reveals that in the short run, a positive statistical relationship exists between the log value of agricultural output and RGDP. This shows that agriculture is a viable source of economic growth in Nigeria.

Furthermore, the error correction term (ECTt-1) with a coefficient value of -0.4712 in the third model (agricultural added value equation) revealed that about 47.12% of the imbalance of the previous period shocks was corrected in each period, while the Johansen Cointegration results confirmed the existence of a long-run relationship among the variables.

Based on the finding, the study concluded that an increase in agriculture output and oil rent leads to increased economic growth both in the long run and short run. The empirical analysis shows the causal flow from agriculture value-added and oil rent to the economic growth and no reverse flow evidence. It shows that the resources from agriculture value-added and oil rent were the channel to develop other sectors of the economy.

A major policy implication arising from this study is the need for increased government investment in the agricultural sector to boost yield in agricultural productivity. With strategic investment and support to the oil sector, the necessary inputs to boost agriculture could be obtained at minimum cost and agricultural productivity rising to provide necessary input for other sectorsof the economy. In the same vein, there is a need for government policy to encourage agriculture extension services, and to educate rural farmers on the advantages of collaborating with commercial farmers and local financial institutions for the purchase of farming equipment, tools, and seedlings to improve productivity. To tackle the problem of the high cost of imported equipment posed by foreign exchange variability, the government should encourage the fabrication of local farming implements by artisans.

Another policy strategy that is driven by agriculture (agricultural demand led to industrialization), advocated by Adelman (1984) could be followed. For the Nigerian economy, agriculture and overall economic growth drive each other, suggesting that the country can enjoy economic prosperity by investing in agriculture. Development policies should also be tailored to the specific economic environment of a country and should reinvestigate the development strategies for a possible overemphasis on agriculture.

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