Contribution of Agricultural Output to Economic Growth in Nigeria (1985 - 2020)

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Abstract

This study examined the contribution of agricultural output to economic growth in Nigeria between 1985 till 2020. Data were sourced from Central Bank of Nigeria and National Bureau of Statistics. The study employed Ordinary Least Squares on gross domestic product, agricultural growth rate, agricultural output, Exchange rate, inflation rate, government spending on agriculture and Money supply. Finding shows that Crop production and Livestock are statistically significant to economic growth while on the other model findings shows that Exchange rate and Money supply are statistically significant to agricultural growth rate. The study recommended provision for easier access to agricultural loans to the farmers to boost the agricultural sector's production. Agriculture as the next crude oil, serious attention by stakeholders in Agricultural sector need to be call upon to put solid policies to drive the sector forward.

Keywords: Agricultural output, Economic Growth

JEDS Codes:

1. Introduction

Agriculture is seen as the best contributor to GDP after oil sector in Nigeria, and its growth is influenced by the political history of the nation, which culminated in higher food production. Agriculture is essential to human existence both locally and globally, as it promotes food security through international trades and related agricultural activities (Smith, 2009). With Nigeria's diversity in agro-ecological conditions, the agriculture sector's products are made possible (Adeaga, *et al.,* 2022). Following the discovery of economically viable amounts of unrefined petroleum in 1960, agricultural productivity has increased dramatically. Agribusiness output accounted for 64% of GDP between 1960 and 1980. It grew to 73.8 million by 2001, generating 16.9% of GDP, and it rose between 1981 and 2001.

Agriculture's GDP share increased significantly between 2000 and 2010. But from 2011 to 2015, output contributed by agriculture is greater than the contribution of agricultural output in 20 years (1981 - 2001). These show a greater improvement in agricultural practice. The egression of new administration back in 2015 leads to positive effect on the GDP. For instance, in 2015, 2016, 2017,

2018, 2019 and 2020, the agricultural output stood at 15.95 million, 16.60 million, 17.17 million, 17.54 million, 17.95 million and 18.34 million all in naira respectively. Although, 2019 and 2020 agricultural performance was halted by insecurities and pandemic. In Q3 2021, agriculture made for 26.57% of the nominal GDP, lower than 2020 and higher than Q2 2021's 28.41% and 22.13%. The sector grew by 1.22% in real terms, but contributed 29.94% to overall GDP, lower than 2020 and higher than Q2 2021's 30.77% (CBN, 2021).

To strengthen the industry for growth, Nigeria's government has developed policies and programs that will enhance agricultural production such as Agricultural Transformation Agenda (ATA) established in 2011, Anchor Borrower's Scheme (ABS) launched in 2015, the Presidential fertilizer initiative (PFI) established in 2017, Agric-business/small & medium enterprises investment scheme (AGSMEIS) in 2017, and Agricultural credit support scheme (ACSS) amended in 2019. More recent is the National Agricultural Technology and Innovation Policy (NATIP) in 2022 with a six year (2022-2027) time frame. All these agricultural initiatives programmes are created to improve the agricultural productivity in the country. More specifically, the anchor borrower's programme has lifted over 150,000 farmers with farm inputs and cash (Balana *et al.*, 2023).

Several studies have discussed the issue of agriculture and economic growth: particularly, Olajide, *et al.* (2011) focus on the relationship between agricultural resources and economic growth in Nigeria. Egwu's (2016) study emphasize on how agricultural financing affects agricultural sector output, economic growth, and poverty reduction in Nigeria. Michael (2017) investigate how agricultural output and economic growth are related. More recently, Akpan *et al.* (2021) investigate the association between agricultural subsector production and Nigerian economy. Busari *et al.* (2022) analyses the effect of agricultural export to economic growth in Nigeria. This study differs, as it looks at the contribution of key components of agricultural sector notably livestock, crop production, fishery and forestry, as well as macro determinants of agricultural output. Although study by Ayanlade, *et al.* (2022) looks at how innovation contributes to agricultural development in Nigeria.

This study primary goal is to provide an empirical analysis of how Nigeria's agricultural output affects economic growth. Since there is a growing body of research on the Nigerian economy. To achieve its objective, the study is organized into five sections. Section 1 is introduction. Section 2 is literature review. Section 3 is methodology. Section 4 is empirical analysis. Section 5 is conclusion and recommendations.

2. Literature Review

This study adopted the Lewis two-sector model (1954), as the model concentrates on the structural transformation of a subsistence economy. The two sectors comprised of the traditional system with overpopulated rural subsistence sector with zero marginal labor productivity, and a modern sector with high-productivity through industrial sector. With output expansion affected by capitalists' reinvestment, the model focuses on labor transfer, increase in output and employment in the contemporary sector. The model uses constant salaries in the urban industrial sector, an improvement over the traditional farm sector's fixed average subsistence earnings.

Studies have focused on the link between agricultural output and economic growth, and it has emerged as the primary topic of policy discussion and debate among academics. As a result, there is need for research on the relationship between agricultural output and GDP growth. The link between agricultural productivity and economic expansion has been the subject of numerous studies (Ettah & Ebu, 2018; Ademola, 2019; Mohammed, 2020; Brown & Iyabode, 2020; Mwangi, 2021). However, there is not enough information to support a consensus regarding the intersection via agricultural production and growth in the Nigerian economy. Early study by Anthony (2010) for instance, uses the least square estimate technique to examine how agricultural loan affects Nigeria's economic expansion, and finding reveals that the agricultural factors influence economic growth, especially in terms of export growth.

Also, study by Bachewe *et al.* (2011) demonstrate the link between agricultural output and economic growth, and their result shows a rise in agricultural products output was attained through higher utilization of required inputs such as agricultural land, labor, and farm implement. Furthermore, Olajide *et al*. (2012) analyses the association between Agricultural resource and its economic prosperity from 1970-2010, and finding shows an increase in agriculture out increases the total economic output. Although, agriculture possess larger part of the well performing sector, as government spending on agriculture, agricultural financial services, and the availability of financial resources are seen as one among the crucial elements to determine how the economy grows. Hence, agricultural output, government spending on agriculture, money supply may be seen as the fundamental factor generating sustainable growth of the economic.

Mohammed (2020) study investigate the determinant of agricultural outputs in Nigeria, and the result shows that finances had a favorable impact on agricultural productivity, agricultural financing and public spending upon agriculture both have adverse impacts. Also, the OLS results show that

agriculture capital, agriculture credit/loan, as well as exchange rate, have a beneficial correlation with agricultural production output. Yet, the study differs with that of Brown and Lyabode (2020) as they used unit root test and granger causality test using Nigeria data. Fortunately, several studies found a strong correlation between agricultural productivity and economic growth in some developing nations. Mwangi (2021) discovers that economic size assessed by GDP is the most important factor in determining agricultural imports into Sub-Saharan Africa between 1995 and 2018.

3. Methodology

In discussing the key components that contributes to agricultural sector in Nigeria, this study obtained data from Central Bank of Nigeria, National Bureau of Statistic, and World Bank covering 1985-2020. A sample frame of 35 years was used based on the availability of the data.

Table 1: Variable Measurement

Variable	Measurement	Source
Gross domestic product	Measured as the total of all the gross value created by all the resident producers in the economy.	Izuchukwu (2011) Ismail & Kabuga (2016)
Agricultural Growth Rate	It includes combination of output that covers different production from agricultural activities	Aimienrovbiye, and Osagie (2021),
Livestock production	Counted as 1000 heads per animal kind,	Mohammed (2020)
Crop production	Measured in tons per hectare	Akpan *et al.,* (2021)
Fishery	Measured by peak to peak approach and fleet hold capacity	OECD (2022)
Forestry	Measured in cubic volume	Oluwatoyese and Dewi (2014)
Exchange rate	Derived as an average for the year from monthly averages (local currency units in relation to the US dollar)	Muraya (2017)
Inflation rate	Represented by the consumer price index as the measure of inflation	Muraya (2017)
Money supply	Measured by money in the deposit's accounts or in the form of other liquid assets	Adegbie & Dada (2018)
Government Expenditure on Agriculture	The amount of money the government sets aside and spends on the agricultural sector of its economy	Yusuf et al, (2013)

This study's primary goal is to assess the role played by agricultural output in the Nigerian economy. Independent variables and dependent variables are initially subjected to a diagnosis test using descriptive statistics. The models' parameters were estimated using the ordinary least squares method in the study. Following is a functional model that is defined from the literatures reviewed: Mathematically,

$$EGT = F (CRP, LSK, FRS, FSH) \quad 1$$

Where, EGT is economic growth, CRP represent crop production, LSK stands for livestock, FRS represent forestry, and FSH signifies fishery.

$$AOP = F (XGR, IFR, GEXPA, MSPY) \quad 2$$

Where AOP indicates agricultural output, XGR stands for exchange rate, IFR represent inflation rate, GEXPA is agricultural government expenditure, and MSPY means money supply. Econometrically,

$$GDP = \beta_0 + \beta_1 CRP + \beta_2 LSK + \beta_3 FRS + \beta_4 FSH + \mu_t \quad 3$$

$$AGR = \beta_0 + \beta_1 XGR + \beta_2 IFR + \beta_3 GEXPA + \beta_4 MNSLY + \mu_t \quad 4$$

Where, μ_t stands for error term, β_0 is the intercept or constant variable, β_s, are the slope of the coefficient, and AGR signifies agricultural growth rate

4. Result and Discussions

The aim of this section is to present the data analysis carried out for this research. In order to achieve that, the chapter consists of a pair of components. Statistics that are descriptive are covered in the first component, whereas OLS prediction is covered in the second. Table 4.1 displays the variables' statistical description, while figure 1.1 projected the results to provide a visual representation of the information.

Table 2: Descriptive Statistics on Contribution of Agricultural Output on Economic Growth

Variable	Mean	Std. Dev.
GDP	37918844	20562519
CRP	7834153.	5019104.
LSK	732677.7	288695.9
FRS	112373.6	38931.41
FSH	186287.4	112453.9
AGR	8865492.	5454214.
XGR	111.8784	100.1713
IFR	19.17818	17.68451
MNSLY	7930.895	10653.57
GEXPA	20.78306	21.94877

Source: Researcher's computation

The result in Table 2 shows the average contribution and standard deviation of each variable to economy from 1985 to 2020. The trend of the flow can be seen in figure 1 with slow growth in the 80s and high growth in 20s. The GDP is 37918844 with a standard deviation of 20562519. The mean value for CRP is 7834153 with a variation of 5019104, and for LSK the average livestock produced is 37 million every year. Also Nigeria cultivate over 1 million goods in terms of forestry, while 186287.4 are usually on average on fishery. The value on the agricultural output has leads to average growth rate 88 million, with average exchange rate value of 112 and inflation rate at 19%. However, the average money supply to economy is 7930, while government expenditure to agricultural activities stood at 21%.

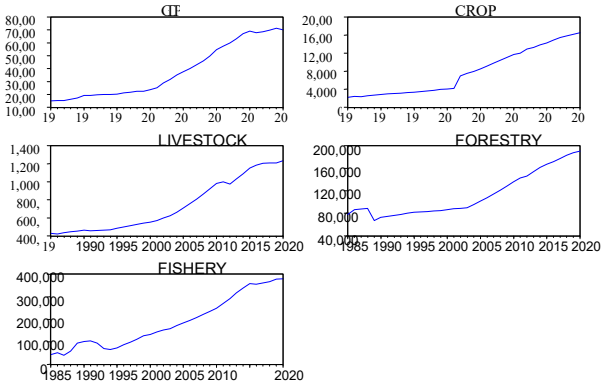


Figure 1: Trends of the variables on agricultural output contribution on GDP (1985-2020)
Source: Researcher's analysis using E-view 9

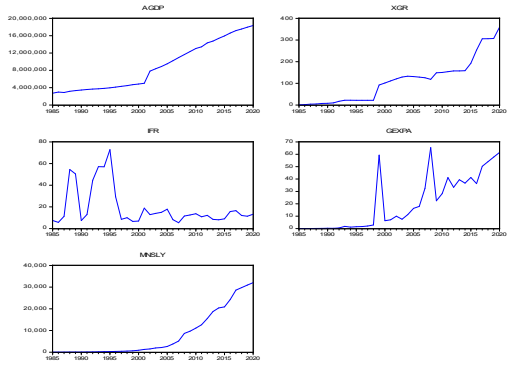


Figure 2: Trends of the variables on determinant of agricultural output (1985-2020)

The OLS regression analysis displays the correlation between GDP and AGDP which are the dependent variable and explanatory variables used in the study.

Table 3: Regression result on GDP and Agricultural Output Rate.

	Dependent Variable: GDP	Dependent Variable: AGR
Variable	Coefficient	Coefficient
CRP	1.162**	
	(0.462)	
LSK	37.259***	
	(12.716)	
FRS	1.228	
	(41.756)	
FSH	34.933*	
	(17.957)	
XGR		21704.55***
		(7570.472)
IFR		-18938.63
		(17379.81)
GEXPA		29772.72
		(23335.38)
MNSLY		231.6990***
		(68.45147)
R-squared	0.994	0.921004
F-statistic	1347.064***	90.35672***
Durbin-Watson stat	0.426	0.360270

Source: Researcher's computation

The result in Table 3 presents the result derived from the OLS test for Economic Growth with other explanatory variables in line with equation 2. The coefficient for crop production is positive and significant 5%, indicating that an increase in crop production will leads to increase in GDP by 1.16. The crop yield in the economy is a significant factor in terms of agricultural production, which is in line with the study of Ademola (2019). Livestock contribute to GDP by 37.26 which is also significant at 1%. The production of livestock aid both consumption and also production process in the economy. The coefficient for forestry is positive but not significant, while fishery production contribute to GDP by 34.93 as the coefficient is positive and significant at 10%. In essence, agricultural activities contribute greatly to GDP given the R^2 value at 0.99.

However on the contribution of macroeconomic variables to agricultural output, the exchange rate value is positive and significant at 1%, signifying that exchange rate influence agricultural output. The coefficient for inflation rate is negative but not significant, which shows that increase in inflationary rate can affect agricultural output. Likewise the coefficient for Government expenditure

on agriculture is positive but also not significant, indicating that a significant substantial amount is not always spent on agricultural sector to boost the output. Although, money supply is positive and significant at 1%, which shows that increase in money supply aid agricultural output. The macroeconomic variables contribute about 92% to agricultural output.

5. Conclusions and Recommendations

From the result obtained this study concludes that crop production and livestock are statistically significant to economic growth. This shows that all explanatory variables had significant effect on GDP except intersect (C), fishery and forestry. Exchange rate, Money supply and the intercept (c) are statistically significant to agricultural growth rate. In conclusion, all explanatory variables posses' significant effect on determinant of agricultural output except inflation and, Government expenditure on Agriculture. In essences, agricultural outputs contribute to economic growth as CRP (crop production) positively impact on GDP. LSK (livestock) positively impact on GDP. FRS (forestry) positively impact on GDP. FSH (fishery) also positively impact on GDP. This study also concludes that determinant of agriculture contributed to the growth rate of agriculture as XGR (exchange rate) impacted positively on AGR. IFR (inflation rate) impacted negatively on AGR. GEXPA (government spending on agriculture) impacted positively on AGR. MNSLY (money supply) impacted positively on AGR.

In light of the above, this study recommends: Provision for easier access to agricultural loans to farmers in other to boost productivity of the agricultural sector. With adequate financing which if easily accessible, the maintenance and purchase of farm equipment used for production will be made much easier which will hasten the production process and thus significantly have a positive relationship with output levels of the agricultural sector.

Financial adjustments on the government's budget so as to allocate more financial aids to the agricultural sector. Doing this will thereby rise government expenditure on agriculture and will provide funding for the smooth running of the sector. With these policies and adjustments put in place by the government, the level of output gotten from the agricultural sector is bound to increase which by extension can lead to positive rise in GDP of the country. Agriculture deserve serious attention by stakeholders from agricultural sector need to be drawn and put in solid policies to drive the sector forward.

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