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Is Agriculture still a Strong Force in Employment Generation in Nigeria? An Empirical Investigation

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Abstract: Despite the huge potentials of agriculture and agribusiness in Nigeria, the level of unemployment remains the issue of concern in the country. Therefore, study regarding agriculture and employment creation in Nigeria requires an urgent attention. However, few efforts to provide empirical evidence to justify the above subject matter in past studies have not yielded substantial results. Against this backdrop, this study provided an empirical answer to the question whether the contribution of agriculture has generated employment in the Nigerian economy. Consequently, secondary data was utilized from 1990 to 2019 with the application of Fully Modified Ordinary Least Squares technique and pairwise Granger causality in analysing the collected data. It is instructive to state that agriculture has a significant impact in employment generation in the country because a unit change in agricultural value added reduces unemployment rate by 11% in the country. However, government expenditure on agriculture has not contributed to employment generation in the country because a unit change in this expenditure leads to 0.036% rise in unemployment rate in the country. Furthermore, the results from Granger causality analysis confirmed that no feedback relationship exists between agricultural value added and unemployment rate in Nigeria. In the light of the above findings, this study makes these recommendations for the policy makers in Nigeria, and as well as its counterparts in Africa by extension as follows; generating employment in Nigeria requires that the policymakers embarks on policies that would create value addition to agricultural products in the country. Also, it is expedient that the policymakers in the country should embark on massive investment in agriculture, and as such creation of employment would be facilitated in the long run.

Keywords: Agriculture, Employment, Value Addition, Unemployment Rate

JEL Classification: Q00

Introduction

Creation of decent jobs for all in developing economies occupied a strategic position in the Sustainable Development goals (United Nations, 2015). Meanwhile, country like Nigeria is bewildered with challenges of unemployment and poverty over a long period of time (Akwara *et al.* 2013). In 1981, unemployment rate in Nigeria was 3.93% comparing to 14.7% in 1990, a decade later the figure rose to

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23.9% (NBS, 2015). However, in the recent times, the level of unemployment in Nigeria has been worrisome. A critical look at the unemployment data indicates that rate of unemployment was 27% in the latter part of 2020 (NBS, 2020). This scenario has become a subject of concern among the policymakers and scholars. In view of the above, various advocacies have been erupted from different quarters for the country to explore agriculture for the creation of employment in large measures for its teeming population. Because the role of agriculture in creating job opportunities cannot be undermined in Nigeria. The Nigerian economy is dominated by the production of primary products which is the one of the major drivers of economic growth in the country. In the same vein, huge quantum of the population lives in the rural centre whose means of livelihood are purely agricultural related activities.

Meanwhile, in the past, especially before crude oil was discovered in Nigeria, the major driver of the Nigerian economy was agriculture. This sector contributed over 71% to the GDP, and at same time provided over 70% of job opportunities in the country (CBN, 1970). The arable land in Nigeria has the capacities to produce various products such as plantain, groundnuts, cocoa, rice, cashew etc. Despite the huge potentials of agriculture and agribusiness in Nigeria, the level of unemployment remains the issue of concern in the country. Against this backdrop, study regarding agriculture and employment creation in Nigeria requires an urgent attention. However, few efforts to provide empirical evidence to justify the above subject matter in past studies have not yielded substantial results. For instance, recent studies such as Aderemi *et al*. (2020) and Obanga (2018) could be faulted in the area of the methodology because these studies failed to use holistic approach to measure the contribution of agriculture in the economy. As a departure from the existing studies, this current study made use of agricultural value added as percentage of GDP to measure the contribution of agriculture in which past studies have ignored in the most recent times. Therefore, this study examined the impact of agriculture to employment generation in Nigeria between 1990 and 2019. The structure of this paper is as follows; the identification of problem of the study was emphasized in the introductory aspect of the study. Review of relevant of literature was carried out in the section two. Meanwhile, section three contains methodology, discussion of results, summary, conclusion and policy implications of the study.

2. Literature Review

This section of the study provides research findings of scholars with respect to the impact agricultural growth and development has had in the creation of jobs in both developed and emerging economies. Various studies have been carried our as regarding the connection between agriculture and employment generation in various economies of the world. Some of these studies are reviewed as follows. For instance, Aderemi *et al*. (2020) examined how agriculture generated employment in Nigeria during the post Structural Adjustment Programme era. The author explored Cointegration, Dynamic Ordinary Least Squares and Granger Causality techniques to estimate the objective of the study. The finding form the study argued that agricultural sector did not contribute a significant impact to employment generation in Nigeria during post SAP periods. The study also affirmed that agricultural expenditure led to an inverse with employment generation in the country. Examining other related study, Ewetan, Fakile, Urhie and Oduntan (2017) applied Johansen co-integration test, Vector error correction model and Granger causality technique to estimate the linkage between agricultural output and the growth of the Nigerian economy from 1981 to 2014. It was discovered from the study that there was an existence of a long run relationship between outputs from agricultural sector and the growth of the Nigerian

economy. Unemployment is a huge problem in many parts of the world, most especially in emerging economies. Agriculture is crucial to reducing the world poverty and unemployment problems. The agricultural sector therefore, is the single most important productive sector which has the capabilities of developing in terms of the number of jobs it provides and available land the nation has (Lyatuu *et al.*, 2015:1). This was also the position of Diao *et al.* (2009), where the authors asserted that the agricultural sector is the only sector that can provide the greatest job opportunities for the poor as 70% of the poor people live in the rural areas. However, in spite of this, there is the problem of unemployment and agriculture is not appealing to the youthful population (Osabohien *et al.,* 2019).

Consequently, Ayinde *et al*. (2017) while researching into the effect of agricultural growth on unemployment and poverty in Nigeria from 1980 to 2012 used the Granger causality and Co-integration model. It was discovered that agricultural growth led to a decrease in unemployment which in turn led to a decrease in poverty rate in Nigeria. This result corroborated the findings of Ayinde (2008), where it was established that there is an inverse relationship between agricultural growth and unemployment in Nigeria. Ogbanga (2018) also looked into the connection between agricultural development and employment generation in Nigeria. Using data obtained from the Central Bank of Nigeria and Federal Office of Statistics which were then analysed using Error Correction and Granger Causality test, it was revealed that agricultural output contributed positively to employment generation in Nigeria.

Furthermore, Osabohien *et al.* (2019) studied the nexus between agricultural development, employment generation and poverty reduction in the West African sub-region. The Generalized Method of Moments (GMM) econometric technique was employed using panel data from year 2000 to 2016. The findings indicate that the poor people in West Africa depend on agriculture to earn more and ameliorate poverty. Adegboyega (2020) studied the relationship between agricultural financing and unemployment rate in Nigeria using time series data which were obtained from the Central Bank of Nigeria (CBN) and the World Bank for a period of 38 years (1981-2018). These data were then subjected to Johansen's Co-integration, Error Correction Method and Granger causality analytical techniques. Results from the research indicated that the injection of funds by the government into agriculture increased employment. Adekanbi (2018) while studying the relationship between agriculture and job creation in Nigeria, concluded that agriculture does have an impact on economic development in Nigeria but observed that as government increases funding to the sector, there is little to show for it. According to the author, this may be due to various factors which include misappropriation of funds by those the funds are entrusted to, insincerity on the part of the government in the sense that most times spending by the government is mainly to score cheap political points and lack of coordination which is evident in the way successive governments abandon projects of their predecessors. Lyatuu *et al*. (2015:2) in a study titled 'The Role of Agriculture in the Economic Growth and Poverty Reduction in Tanzania' observed that majority of Tanzanians live in rural areas and derive much of their livelihoods from agriculture. Result findings revealed that investment in agriculture will increase farm employment, better the lives of the people and further lead to reduction in the number of youths leaving rural areas to urban areas in search of employment.

Meanwhile, Frija *et al.* (2020) conducted a research in 14 African countries which included Nigeria, Senegal, Kenya, Ethiopia, Egypt, Sudan, Tunisia, and Algeria among others on the effect agricultural growth has on sex disaggregated employment in Africa. The authors' findings revealed that investment in agriculture is capable of generating more employment benefits for the people.

A study was conducted by the Agriculture, Forestry and Fisheries Department of the Republic of South Africa (2010) to analyse tends in employment in the agricultural sector from year 2000 to 2010 using data from Stats SA. In contrast, the findings revealed that investment in agriculture does not necessarily translate to increase in employment. Findings indicated that investment in agriculture in the country, for example in the area of mechanisation, tend to lower the demand for farm labour, leading to unemployment in the sector. This is in line with the position of Simbi and Aliber (2000), who posited that the use of machines in agriculture has huge implications for employment in the South African agricultural sector. According to the authors, the scientific advancement in the use of agricultural chemicals and its method of application are reducing the need for labourers. Aliber *et al.* (2007) had earlier forecasted that the adoption of labour-using technologies such as animal traction rather than the use of machines in South Africa is likely to increase labour jobs in their agricultural sector. Mitullah *et al.* (2017), in an analysis of employment creation in agriculture and agro-processing sector in Kenya noted that while agriculture has the tendency to increase employment, the absence of government support in terms of financing and absence of extension services has hindered the capability for employment among small holder farmers. The authors observed that this was because a lot of these small holder farmers use family labour and as such are not able to increase paid employment.

Collinson *et al.* (2016) while researching into the nexus between youth migration, livelihood prospects and demographic dividends in South Africa revealed that the percentage of youths engaged in agriculture fell by more than 5% over the period of 12 years between year 2000 and 2012. It was revealed that African youths preferred white collar jobs than getting involved in agriculture. Jayne *et al.* (2017) while studying the drivers of change in African agriculture in nine African countries observed that many countries in Africa are witnessing massive exodus of labour from the farm to off farm sectors. According to findings from the research which was carried out from year 2003-2013, the percentage of the labour force involved in farming fell during the period under study in countries like Zambia, Rwanda, Tanzania, Mali and Malawi. However, the reverse was found to be the case in Nigeria as the percentage of people engaged in farming rose by about 12%. Girard (2017), in a study conducted in South Africa pointed out that large scale farming does not lead to employment generation. This may be due to the fact that commercial farming employs more of the cultivation of capital-intensive crops and as such less workers per 1000 hectares. Also, the author noted that the establishment of commercial farms on former smallholder farms will jeopardise their source of livelihood. The author therefore concluded that the practice of large-scale agriculture only generates employment in the fledging phase, in the area of preparing the land and this employment is only for a short period.

Moreover, in Cambodia, agriculture has always provided the major source of employment for the rural population with many of the households engaging in rice production (Chandararot and Liv, 2013). The authors noted that the bulk of the rural employment is in vulnerable employment, which refers to workers employed in precarious situations, and also family members who may often be used for unpaid labour. According to the authors, workers in this "vulnerable employment" often most likely do not have regular wages or any social protection. They are also exposed because they do not have protection from work risks and hazards. The opposite of this is "paid employment". The authors concluded that paid employment is found more in large scale farms or commercial agriculture. Only a few household farms engage paid employment. The authors also observed that there is shortage of labour in Cambodia in rural areas for agriculture. This is because many people have moved to the cities for better opportunities.

It was also observed the farmers have had to pay higher wages for the few labour available and this in turn has increased their cost of production.

Behera (2016) observed that although the agricultural sector in India employs a bulk of the workforce, employment generation is slow. The author noted that even though investment in the sector has led to more growth, it has not really done much in the area of employment generation. China has witnessed reasonable increase in investment in agriculture in recent years, and this agricultural investment has been the bedrock for the steady transformation and growth of the agricultural sector in the country (Huang and Rozelle, 2018). This supports the assertion of Xuezhen (2010), who after analysing data from China from 1952 to 2007 observed that agriculture has reinforced the growth of the economy and to some extent helped in employment generation. Government investment in rural road infrastructure in China to link farms with wholesale markets has also been shown to ameliorate poverty and increase off-farm employment (Zhang *et al*. 2004).

3. Methodology

The study utilized data from secondary sources. Data for agricultural value added as percentage of GDP, population growth rate, government expenditure on agriculture were selected from the World Development Indicators of the World Bank. Whereas, FDI data were selected from UNCTAD document and unemployment rate data were extracted from the Central Bank of Nigeria Statistical bulletin.

3.1. Specification of Model

Getting an appropriate model for the estimation of the relationship between agriculture and employment generation in Nigeria requires an insight drawing from works such as Aderemi *et al.* (2021), Olayemi *et al*. (2019), Aderemi *et al.* (2020) and Obanga (2018) by adapting their model with the elimination of variables that do not have relevance with this study. Therefore, the functional form of the model could be presented as follows;

UEMP= F (AVG) (1)

If model one is written in explicit form in order to include some control variables, the model is in this form

UEMP = F (AVG, GEA, PGR, FDI) (2)

Model (2) could be linearized by introducing natural log to some of the control variables in identity form.

$$UEMP = \propto_1 + \beta_1 AVG_t + \beta_2 LogGEA_t + \beta_3 PGR_t + \beta_4 LogFDI_t + \varepsilon_t \quad (3)$$

Meanwhile, UEMP is unemployment level measured by unemployment rate. AVG is used to proxy the contribution of agriculture and is measured by agricultural value added as percentage of GDP. GEA is government expenditure on agriculture. PGR is population growth rate. FDI in FDI inflows in the country. $\boldsymbol{\varepsilon}$ is error term, t ranges from 1990 to 2019. The apriori expectation of the model should follow this pattern$\boldsymbol{\beta_1, \beta_2\ and\ \beta_4 < 0}$. $\boldsymbol{\beta_3}$ >0.

4. Result and Discussion

Table 1. Descriptive Statistics

	UEMP	AVG	LogGEA	PGR	LogFDI
Mean	7.807833	24.39859	3.500017	2.576149	21.48584
Median	3.830000	24.47535	3.752988	2.579310	21.41909
Maximum	33.30000	36.96508	6.226082	2.680914	22.90267
Minimum	3.590000	19.99025	-0.400478	2.488785	19.51785
Std. Dev.	7.653918	3.841205	1.903290	0.068625	1.004775
Skewness	0.098981	0.460419	-0.343374	0.156171	-0.360641
Kurtosis	6.482489	5.544654	2.145334	1.570518	2.025632
Jarque-Bera	37.18827	19.38347	1.502596	2.765426	1.898287
Probability	0.000000	0.000062	0.471754	0.250897	0.387072
Sum	234.2350	756.3564	105.0005	79.86062	666.0609
Sum Sq. Dev.	1698.891	442.6456	105.0528	0.141281	30.28719
Observations	30	30	30	30	30

Source: authors` calculation (2021)

In table 1, the results of the estimated descriptive statistic of the relevant variables were presented as follows; UEMP used to proxy unemployment rate from 1991 to 2019 in Nigeria had 3.59% and 33.3% as minimum and maximum values concurrently. The mean value of the data is 7.81% alongside of standard deviation of 7.65%. The implication of this is that the unemployment rate data dispersed moderately from its mean because the standard deviation is less than its mean value. In the same vein, other variables, AVG, LogGEA, PGR and LogFDI had similar features like unemployment rate. Therefore, these variables dispersed moderately from their mean.

Table 2. Unit Root Test

	ADF Test						
Variables	Level	Prob	1st Dif.	Prob.	2nd	Prob.	Decision
UEMP	2.948352	1.0000	-1.937664	0.3113	6.299086	0.0000	I(2)
AVG	1.942772	0.309	5.950654	0.0000			I(1)
LogGEA	1.58542	0.4770	5.90380	0.0000			I(1)
PGR	2.712220	0.0841	1.916590	0.3203	0.793894	0.0504	I(2)
LogFDI	1.345040	0.5936	2.322456	0.1725	9.422896	0.0000	I(2)
	PP Test						
	Level	Prob.	1st Diff.	Prob.	2nd Diff.	Prob.	Decision
UEMP	7.2136	1.0000	1.93766	0.3113	8.9132	0.0000	I(2)
AVG	-2.371956	0.1578	-5.703532	0.0001			I(1)
LogGEA	1.404285	0.5664	6.532478	0.0000			I(1)
PGR	1.204553	0.6592	2.18851	0.2144	0.793894	0.0454	I(2)
LogFDI	1.691017	0.4254	6.74379	0.0000			I(1)

Source: authors` calculation (2021)

Testing for staionarity property of time series data is one of the major pre-tests required in estimating relationship among variables of interest in this paper. This is because a spurious or nonsense result could emanate from a study that focuses on time series data if not well handled. In the light of the above, the standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were employed to assess the stationary status of the series. The estimated results indicate that

UEMP, PGR and LogFDI are stationary after second differencing. While, AVG and GEA are stationary after first differencing. The implication of this is that all the data series in this study are not free from the problem of unit root.

Table 3. Johnansen Cointergration Test (Trace Statistics) and (Maximum Elgen value) `

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	P-Value	Max-Eigen Statistic	P-Value
None*	0.979471	161.3648	0.0000	108.8062	0.0000
At most 1*	0.579651	52.55859	0.0169	24.26673	0.1257
At most 2	0.495562	28.29185	0.0738	19.16072	0.0923
At most 3	0.251594	9.131135	0.3534	8.114655	0.3672
At most 4	0.035652	1.016480	0.3134	1.016480	0.3134

Source: authors` calculation (2021)

The presence of unit root problem in the series employed for this study instigated the test for the long run equilibrium relationship between the dependent variable and explanatory variables in Nigeria within the context of Johansen Cointegration Test. The estimated results in Table 3 affirmed that at most four (4) cointegration vectors present among these variables. This is an indication that a long run equilibrium relationship is present among these variables in the model.

Table 4. Impact of Agriculture on Employment Generation in Nigeria

Dependent Variable: UEMP

Method: Fully Modified Least Squares (FMOLS)

Regressors	Coefficient	T-statistics	Prob. Value
AVG	-1.116188	3.764558	0.0010
LogGEA	3.588692	3.985094	0.0005
PGR	-104.7185	2.818977	0.0095
LogFDI	2.832489	1.251006	0.2230
R-Squared	0.666571		

Source: authors` calculation (2021)

Table 4 shows the long run estimated results of the relationship between agriculture and employment generation in Nigeria using Fully Modified Ordinary Least Square technique. Firstly, it is only AVG follows the aprori expectation. The R-Squared which is 0.667 shows that AVG, LogGEA, PGR and LogFDI jointly explained about 67% of the systematic variations in unemployment rate. The implication of this is that the model is relatively good for the analysis of the study. Meanwhile, agricultural value added as percentage of GDP has a negative and significant relationship with unemployment rate in Nigeria. This shows that agriculture has a significant impact in employment generation in the country because a unit change in agricultural value added reduces unemployment rate by 11% in the country. This finding is supported by the assertions of Adegboyega (2020) and Ayinde *et al*. (2017) in Nigeria, Mitullah *et al.* (2017) in Kenya, Frija *et a*l. (2020) in 14 African countries, Huang and Rozelle (2018)

in China and Chandararot and Liv (2013) in Cambodia in similar studies. The reason for this might be as a result of the fact these countries have similar economic structures. However, the finding in this study contradicts the submissions of Aderemi *et al*. (2020) in Nigeria, Girard (2017) in South Africa and Behera (2016) in India in related studies. The disparities in this finding might be as a result of usage of different techniques of estimation and data scope. Whereas, government expenditure on agriculture has a positive and significant relationship with unemployment rate. This implies that government expenditure agriculture has not contributed to employment generation in the country because a unit change in this expenditure leads to 0.036% rise in unemployment rate in the country. In the same vein, population growth rate and unemployment rate possess a significant negative relationship in Nigeria. But FDI inflows and unemployment rate have an insignificant positive relationship in the country.

Table 5. Pairwise Granger Causality Test between Unemployment and Agriculture in Nigeria

Null Hypothesis:	F-Statistic	Prob.	Decision	Causality
AVG does not Granger Cause UEMP	0.07173	0.9310	Reject	
UEMP does not Granger Cause AVG	0.61350	0.5497		
LogGEA does not Granger Cause UEMP	0.12820	0.8803	Reject	
UEMP does not Granger Cause LogGEA	1.01493	0.3781		
PGR does not Granger Cause UEMP	0.39790	0.6761	Reject	Unidirectional
UEMP does not Granger Cause PGR	4.77727	0.0179	Accept	
LogFDI does not Granger Cause UEMP	0.26302	0.7709	Reject	
UEMP does not Granger Cause LogFDI	0.20452	0.8164	Reject	
LogGEA does not Granger Cause AVG	2.69377	0.0889	Reject	
AVG does not Granger Cause LogGEA	1.72748	0.2000	Reject	
PGR does not Granger Cause AVG	8.73082	0.0014	Accept	Unidirectional
AVG does not Granger Cause PGR	0.68015	0.5160	Reject	
LogFDI does not Granger Cause AVG	0.96195	0.3964	Reject	
AVG does not Granger Cause LogFDI	0.63531	0.5384	Reject	
PGR does not Granger Cause LogGEA	2.25921	0.1271	Reject	
LogGEAdoes not Granger Cause PGR	1.86031	0.1783	Reject	
LogFDI does not Granger Cause LogGEA	2.42432	0.1108		
LogGEA does not Granger Cause LogFDI	0.41264	0.6667	Reject	
LogFDI does not Granger Cause PGR	2.95988	0.0710	Reject	Unidirectional
PGR does not Granger Cause LogFDI	3.90802	0.0339	Accept	

Source: authors` calculation (2021)

Having established cointegrating relationship among the set of variables of interest, the authors made further efforts to subject these variables to Granger causal analysis employing a Pairwise Granger causality approach. It is instructive to state that the estimated results in Table 5 confirms the following among others. No Granger causality exists between agricultural value added and unemployment rate in Nigeria. Whereas, a unidirectional causal relationship flows from unemployment rate to population growth rate. Also, unemployment rate and FDI inflows possess no feedback relationship with each other. Ditto for government expenditure on agriculture and agricultural value added. Furthermore, population growth rate Granger causes agricultural value added, and ditto for population growth rate and FDI.

5. Conclusion and Recommendation

This study has provided an empirical answer to the question whether the contribution of agriculture has generated employment in the Nigerian economy. Consequently, secondary data was utilized from 1990 to 2019 with the application of Fully Modified Ordinary Least Squares technique and pairwise Granger causality in analysing the collected data. It is instructive to state that agriculture has a significant impact in employment generation in the country because a unit change in agricultural value added reduces unemployment rate by 11% in the country. However, government expenditure on agriculture has not contributed to employment generation in the country because a unit change in this expenditure leads to 0.036% rise in unemployment rate in the country. In the same vein, population growth rate and unemployment rate possess a significant negative relationship in Nigeria. But FDI inflows and unemployment rate have an insignificant positive relationship in the country. Furthermore, the results from Granger causality analysis confirmed that no feedback relationship exists between agricultural value added and unemployment rate in Nigeria. Whereas, a unidirectional causal relationship flows from unemployment rate to population growth rate. Also, unemployment rate and FDI inflows possess no feedback relationship with each other. Ditto for government expenditure on agriculture and agricultural value added. Furthermore, population growth rate Granger causes agricultural value added, and ditto for population growth rate and FDI.

In the light of the above findings, this study makes these recommendations for the policy makers in Nigeria, and as well as its counterparts in Africa by extension as follows; generating employment in Nigeria requires that the policymakers in Nigeria embarks on policies that would create value addition to agricultural products in the country. Also, it is expedient that the policymakers in the country should embark on massive investment in agriculture, and as such creation of employment would be facilitated in the long run.

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