

Agriculture as an Accelerator for Nigeria Economic Sustainable Development

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Abstract

The main focus of this paper is to investigate the impact, explore the possibilities and highlight the teething challenges that have masked the significant roles of agricultural sector in the transformation process of the Nigeria's economy. This paper span the period 1970 to 2010 by using annual times series data. The Ordinary Least Square (OLS) estimation method was adopted to examine the impact of agricultural sector in the economic growth of Nigeria. The variables employed include: Gross Domestic Product (GDP), output of agricultural sector, share of agriculture in the GDP, index of agricultural production, and ratio of agricultural output to GDP. The results of the analyses showed that the Nigeria agricultural sector contributes immensely to the economic growth of Nigeria but the over-dependence on the oil sector has over shadowed the potentials of the sector.

In conclusion, some of the recommendations made in the study were that: the Nigerian agricultural policy needs to be evolved; there is need for national re-orientation towards agriculture or farming, the activities of agriculture financing, institutions in providing finance and credit for rural farmers, should be supplemented with the provision of road networks, rail system and warehouses, in order to further encourage farmers to increase their production etc.

Keywords: Agriculture Sector, Economic growth, Gross Domestic Product, Nigeria

INTRODUCTION

In any economy, successful economic development depends upon balanced interaction between various sectors, over a period of time. Often, the process of this interaction is such that some sectors become more important than other, depending on the level and stage of development. In contemporary Africa, agriculture and industry can be identified as examples of the key sectors whose roles are and will remain crucial to development fortunes. Emphasizing the importance of agriculture generally, Gunnar Myrdal notes that "It is in the agricultural sector that the battle for long term economic development will be won or lost. This assertion has been supported by both historical and contemporary development experience. The Strategic role of the industrial sector, on the other hand, has been so dramatized that, rightly or wrongly, successful development has been equated with industrialization.

When the roles of agriculture and industry are juxtaposed as in the above context, it would appear that they are competitive. It was this impression which led to erroneous development policies that opted for industrialization to the detriment of agricultural development. However, experience has since shown that both agriculture and industry are strategically complementary.

The remaining part of the study is organized into sessions. Following the introduction is section two which deals with the literature review concerning the role of agricultural sector in economic development. Section three presents the methodology analyses, which includes the characteristics and basic elements of the study. Data presentation, analysis and interpretation are covered in section four while the concluding part of the study is section five where in a nutshell the summary, conclusion and recommendations are given.

Literature Review

Although, many of the studies reviewed in this section did not address the performance of the Nigerian Agricultural sector directly, their findings are considered applicable to the Nigerian scenario. Importantly, the studies discussed in this chapter represent only a small subset of the studies conducted on the role of Agriculture in economic growth and development and were chosen to be illustrative rather than comprehensive.

The literature reviews are divided into three parts. The first part is the theoretical review; the second

part evaluates the performance of the Nigerian agricultural sector; while the final part discusses issues relating to agricultural financing in Nigeria.

Theoretical Review

The role of agriculture in the growth and development of any economy cannot be over-emphasized. This has been acknowledged by both classical and contemporary economists. In the classical tradition, Ricardo (1777 – 1823) noted that the problem of diminishing returns to agriculture would set a limit to the growth of other sectors of the economy. In the same vein, the validity of Malthusian law of population rests on agricultural stagnation in the face of growing human numbers. Most contemporary views regarding the contribution of agriculture to development emanated from these early thoughts. Furthermore, the physiocrats in the eighteenth century France defined the development process virtually in terms of agricultural progress. Thus, they claimed that only cultivated products of the land formed the basis of national wealth, and the national income was measured exclusively by the value added from farming activity. To the physiocrats, all other activities were not only secondary but essentially unproductive.

Gollin (2009) state that, agriculture employs most of the labour force and also accounts for large fractions of economic activity, measured in value terms in Africa. This, according to him, implies that agriculture's share of employment is substantially higher than its share of GDP in most African countries. This means that if agriculture accounts for a higher share of employment than of value added, then output per worker in agriculture must be lower than in non-agriculture, suggesting that there is under-utilization of manpower in the sector in the continent. Furthermore, Gollin (2009) states that beyond productivity and agriculture's role as a productive sector, there are other reasons to focus on African agriculture as a sector that affects growth and poverty. According to him one particularly important issue is the sector's central role in feeding Africa's population – and its impacts on poverty via this channel.

Gollin and Rogerson (2010) examine the agricultural sector's role in economic development in Uganda using a static general equilibrium model that reflects key features of the Ugandan economy and also a two-sector model in which there is an agricultural sector and a non-agricultural sector. It

was found that agricultural productivity improvements have a relatively large impact on the economy because the non-agricultural sector is initially small, and because the economy faces a subsistence constraint that limits the expansion of the non-agricultural sector, Improvements in non-agricultural TFP (Total Factor Productivity) have relatively small positive impacts on the economy.

Johnston and Mellor (1961) argued that agricultural sector serve as a market for the produce of modern sector and that the sector is likely to serve as the main source of savings necessary to finance the expansion of the modern sector. Timmer (1995), Martins and Mitra (2001) testified to the important role agriculture played in economic development

Theoretically ,the agricultural sector in developing countries including Nigeria as highlighted by Ihimodu (1993) is often credited with the potential of contributing substantially to the overall growth and development of the economy in the following areas .

- i . The growth of the non -agricultural sector is heavily dependent on the domestic agriculture for a sustained increase in food supply and also for the raw materials consumed in the agro -allied manufacturing sector. This is referred to as the product contribution of agriculture.
- ii . During the early stage of economic growth, the agrarian population constitutes a large proportion of the home market for both producer as well as consumer goods. This is known as the market contribution.
- iii. Since the relative importance of agriculture declines over the years, following the process of economic growth and development, the sector often serves as the main source of capital for investment in the other sectors of the economy . Therefore the development process involves the transfer of surplus capital from the agriculture sector to the non-agriculture sectors . Also the process of growth implies a transfer of surplus labour from agriculture to non -agricultural activities especially over a long period . This is referred to as the factor contribution.

Ukeje (2002) notes that agriculture has ever been in the mainstream of economic development since the mid-eighteenth century till now, meaning that there is no development strategy that can evolve without agriculture attracting special attention because of its

grassroots importance. The writer observed that “in virtually all under-developed economies agriculture is an existing industry of major proportions in most cases, the only existing industry of any consequence. Typically, 40 to 60 percent of the national income is produced in agriculture and from 50 to 80 percent of the labour force is engaged in agricultural production”.

Further, he stated that “agriculture plays a more positive role in stimulating growth in other sectors, but needs to grow rapidly itself and for the stimulation to be effective, the government's role may need to be more active. He listed four roles for agriculture in economic development as to increase the supply of food for domestic consumption; to release labour for industrial output,;- to increase the supply of domestic savings; and to earn foreign exchange”. The above submissions show the importance of the agricultural sector and should ordinarily call for better attention in form of government's direct involvement in agricultural production and financial support for this all-important sector.

Empirical review

The performance of the Nigerian agricultural sector in the past three decades leaves little or nothing to be desired, in spite of the efforts to promote the sector. Although, the performance of the sector has been relatively stable and impressive in recent times, at 255.9 (1990=100), the provisional aggregate index of agricultural production increased by 5.7%, compares with the 6.8% increase in 2009 (CBN, 2010). The growth was, however, below the national sectoral target of 8%. The increase in agricultural production was propelled, largely, by the favourable weather condition and the sustained implementation of various agricultural programmed initiated in 2009. The agricultural sector recorded a growth rate of 5.7% in 2010 down from 5.9% in 2009 and its contribution to the growth rate of Gross Domestic Product (GDP) has remained very low and it was 2.4% in 2010 (CBN, 2010).

It is an established historical fact that before the ascendancy of crude oil in the mid-sixties, non-oil export sector was dominated by agriculture, played significant role in the economy. It was the major contributor to Nigeria's Gross Domestic Product (GDP), it was also the primary source of foreign exchange. But, the structure of Nigeria economy changed dramatically from the mid 70s when crude oil succeeded in taking the place of traditional

agricultural products as the dominant source of government revenue. However, the collapse of the world oil market in 1981 through 1986 resulted in a drastic fall of oil production to a daily average of 1.23 million barrels per day in 1981 and 1.0 million barrels per day in 1982 from 2.2 million barrels per day in 1978, while the earning from oil exports reduced drastically.

During this period the government has intervened in the sector through its policies and programmes to strengthen the sector's capacity to perform its traditional roles. Assessment of the effect of these policies and programmes has thrown up mixed conclusions. Obadan (1994) suggests that agricultural sector did respond positively to policy reforms, particularly in the 1980s. Others suggest that there has been a general failure of the sector to respond appropriately, to the policies (Olomola, 1998).

Muhammad-Lawal and Atte (2006) employed descriptive statistics and regression analysis to study the growth of the agricultural sector of the Nigerian economy with the view of identifying factors affecting domestic agricultural production. They found that the overall agricultural production average growth rate was 5.4% and that GDP growth rate, population growth rate, and the Consumer Price Index were the main factors affecting domestic agricultural production. Muhammad-Lawal and Atte (2006) further revealed that the contribution of agriculture to the Nigerian economic growth is very low compared to what it used to be in the past stressing that Nigerian agriculture to a large extent still possesses the characteristics of a peasant economy that was prominent in the pre-independence period.

Utomi (2004) argued that the legacy of oil in Nigerian economy was in structural distortions and cultural deformation. In terms of structural distortions, he said it led to the demise of other sectors, beginning with agriculture that had sustained a healthy rate of growth, and then of manufacturing, which first received an apparent boost in investments, but because of a culture of waste and corruption, derived from oil values, went into decline. A culture of seeking economic rent and a share of the so called national cake, the bureaucratic bottleneck would affect the work ethic, entrepreneurial dispensation and orientation to questionable payments thus making transaction costs very high in the economy.

Data Sources

Secondary data were used in this study. They were sourced mainly from the publications of the Central Bank of Nigeria (CBN) namely; CBN Statistical Bulletin, CBN Statement of Accounts and Annual Reports, and Bureau of Statistics publications. The variables for which data were sourced include: Gross Domestic Product (GDP), output of agricultural sector, **Share of agriculture in the GDP, Index of Agricultural production, and Ratio of agricultural output to GDP** for the period 1970 to 2010.

Model Specification

The models to investigate the role of the agricultural sector in the economic growth and development of Nigeria are stated below with the dependent variable as the Gross Domestic Product (GDP) while the explained variables are output of agricultural sector, share of agriculture in the GDP and index of agricultural production, ratio of agricultural output to GDP; so that:

MODEL I

$GDP = (Out_{ag}, Ag_{gdp}),$
 $GDP = a_0 + a_1 Out_{ag} + a_2 Ag_{gdp} + U_i$
 where, GDP = Gross Domestic Product
 Out_{ag} = Output of the Agricultural Sector
 Ag_{gdp} = Share of agriculture in the GDP
 a_0, a_1 and a_2 - Parameter
 U_i - Error term

MODEL II

$GDP = (Ind_{agr}, rAgGDP)$
 $GDP = b_0 + b_1 Ind_{agr} + b_2 rAgGDP + U_i$
 where GDP - Gross Domestic Product
 Ind_{agr} - Index of Agricultural production
 $rAgGDP$ - Ratio of agricultural output to GDP
 b_0, b_1 and b_2 - Parameters
 U_i - Error term

Data Presentation and Analysis

This chapter is devoted to the presentation and analysis of the data collected from the publications of Central Bank of Nigeria (CBN). The choices of statistics adopted in this chapter are regression analysis and Analysis of Variance (ANOVA). The variance of the estimate is obtained by multiplying the standard error with the square reciprocal of the derivative i.e. variance.

The traditional test of significance of the parameter estimates in the standard error test, which is equivalent to the student's t-test. The correlation

coefficient (r) shows the relationship between the variables. The relationship could be of a direct, indirect or an outright zero correlation.

The standard error is obtained by taking the inverse of the variance of the estimate. The standard errors for the estimate of a_1, a_2, b_1 and b_2 will be dealt with in this project. The standard error for the estimates a_0 and b_0 are left out because they are mere constants. The F-Ratio is used to determine the overall significance of the regression models i.e. to determine the extent to which the variations in the dependent variable can be attributed to changes in the explanatory variables. This test shall be used to measure the extent of the claimed relationship between the Gross Domestic Product (GDP) and the performance indicators of the agricultural sector i.e.

output of agricultural sector, **share of agriculture in the GDP, index of agricultural production, and ratio of agricultural output to GDP** for the period. F-ratio would also be used to test for causality between the variables.

The coefficient of determination (R^2) is used to determine the overall significance of the model just like the F-ratio. A high coefficient of determination signifies that the regression model is statistically significant, meaning that there is high relationship between the dependent variables and the interdependent variables.

The empirical findings made in this chapter shall be summarized in the next chapter with appropriate recommendations made according to the findings.

Presentation of Regression Results

MODEL I

GDP	=	a_0	+	a_1 Out _{ag}	+	a_2 Ag _{gdp}
GDP	=	24339.158	+	364.87 Out _{ag}	+	2.158 Ag _{gdp}
Std. Error		(8288.946)		(220.542)*		(0.112)*
t – Stat.		(2.936)		(1.654)		(19.209)
F Ratio				1523.161		
R^2				0.988		
$\overline{R^2}$				0.987		
Std of gdp	-			24344.16222		
D-W	-			0.521		
N	-			41		
d.f	-			$N - K = 41 - 3 = 38$		

* Figures in parentheses are the standard errors

a – tested at 5% level of significance

Source: Computed by Author from SPSS Regression Results

MODEL II

GDP	=	b_0	+	b_1 Ind _{agr}	+	b_2 rAgGDP
GDP	=	-65392.8	+	3089.549 Ind _{agr}	-	0.0000002 rAgGDP
Std. Error		(22135.582)		(157.138)		(4950413)
t – Stat.		(-2.954)		(19.661)*		(-4.574)*
F-Ratio	-			257.204		
R^2	-			0.931		
$\overline{R^2}$	-			0.928		
Std of gdp	-			57523.44071		
D-W	-			0.381		
N	-			41		
d.f	-			$N - K = 41 - 3 = 38$		

* Figures in parentheses are the standard errors

a – tested at 5% level of significance

Source: Computed by Author from SPSS Regression Results

Interpretation of Regression Results

MODEL I

Going by the results of the first regression, there is positive relationship between gross domestic product, and output of the agricultural sector, and the **share of agriculture in the GDP**. The degree of responsiveness of gross domestic product to changes in the output of the agricultural sector is more proportional depicting that the sector has high impact on the level of economic growth and development in Nigeria.

Since the standard error of the output of agriculture S.e. (a_1): 220.542 is greater than half of the parameter estimate ($a_1/2$): 182.435, we shall therefore accept the null hypothesis and reject the alternative hypothesis. This indicates that the parameter estimate is not statistically significant, meaning that output of the agricultural sector does not impact significantly on the growth and development of Nigeria. On the other hand, the standard error of the share of agriculture in GDP (0.112) is less than half of the parameter estimate (1.079); we shall therefore reject the null hypothesis and accept the alternative hypothesis indicating that the parameter estimate is statistically significant.

From the t-table, the theoretical t-value at 5% level of significance with (38) degrees of freedom is 1.684. Since the theoretical t-value is less than the calculated t-value for the share of agriculture in GDP (19.209), we shall reject the null hypothesis and accept the alternative hypothesis. This implies that the parameter estimate is statistically different from zero i.e. it is a relevant variable that affects the economic growth and development of Nigeria. But in the case of output of the agricultural sector, the theoretical t-value is greater than the calculated t-value (1.654); we shall accept the null hypothesis and reject the alternative hypothesis. This implies that the parameter estimate - output of the agricultural sector is not a significant variable that affects economic growth and development of Nigeria.

The coefficient of determination gives 0.988 or 98.8% meaning that the regression model is approximately 99% significant i.e. the variations in the dependent variable i.e. Gross Domestic Product is 99% attributable to the changes in the independent variables i.e. **output of the agricultural sector** and the share of agriculture in GDP. This result is supported by the high value of the adjusted R-Square which is 98.7%.

The theoretical F-value at 5% level of significance with $v_1 = 2$ and $v_2 = 38$ is 4.08. Since the calculated F-value (1523.161) greater than the critical value, we shall reject the null hypothesis and accept the alternative hypothesis. This signifies that the overall regression or relationship between the Gross Domestic Product, **output of the agricultural sector** and the share of agriculture in GDP is significant so, the changes in the Gross Domestic Product can be attributed to changes in the explanatory variables i.e. **output of the agricultural sector** and the share of agriculture in GDP.

The computed D (Durbin Watson) in model one is 0.521, which reveals to us that there is some degree of positive autocorrelation between the Gross Domestic Product, **output of the agricultural sector** and the share of agriculture in GDP in Nigeria.

MODEL II

The results of the second regression show that there is positive relationship between Gross Domestic Product and index of agricultural production. This result conforms with the A'priori expectation that was earlier stated. But the ratio of **agricultural output to GDP varied inversely with the Gross Domestic Product**.

In the case of the standard error test; the standard error of the parameter estimate for index of agricultural production S.e.(b_1) (157.138) is less than the half of the parameter estimate (1544.77), we shall therefore reject the null hypothesis and accept the alternative hypothesis. This signifies that the parameter estimate – index of agricultural production is statistically significant i.e. it is a relevant variable that affects the Gross Domestic Product of Nigeria. However, the opposite is the case for the ratio of **agricultural output to GDP** in which the standard error (4950413) is greater than half of the parameter estimate.

The t-table shows that the theoretical t-value at 5% level of significance **with thirty-eight (38) degree of freedom is 1.684**. The theoretical t-value is less than the absolute value of the calculated t-values for index of agricultural production (19.661) and the ratio of **agricultural output to GDP (4.574)**. This reveals that both the index of agricultural production and ratio of **agricultural output to GDP** are statistically different from zero and as

such, significant determinants of the economic growth and development of Nigeria.

In this model the coefficient of determination gives 0.931 or 93.1%. This shows that the regression model is approximately 93% significant i.e. the variation in the Gross Domestic Product is about 93% attributable to the changes in the dependent variables, which are the index of agricultural production and ratio **of agricultural output to GDP**. Besides, the high value of the adjusted R-square to the tune of 92.8% reveals to us that the agricultural sector can be said to have spur economic growth in the country.

The theoretical F-value at 5% level of significance with $v_1 = 2$ and $v_2 = 38$ is 4.08. The calculated F-value (257.204) is greater than the critical value, we shall therefore reject the null hypothesis and accept the alternative hypothesis. This means that the overall regression or relationship between the Gross Domestic Product, index of agricultural production and ratio **of agricultural output to GDP** is statistically significant.

The computed D (Durbin Watson) in this model is 0.381, which also shows to us that there is some degree of positive autocorrelation between the Gross Domestic Product, index of agricultural production and ratio **of agricultural output to GDP**.

Summary, Conclusion and Recommendations

In the preceding four chapters, this study has traced the development of the agricultural sector and its contribution to the economy with particular reference to Nigeria. The study was also able to look at the potentials of the agricultural sector and the effort so far put in place by the government to revamp the Nigeria agricultural sector. Though the period under review showed a gradual but uneven growth of the agricultural sector, there still exists a need for increased stimulation in the sector in order for a greater and more meaningful contribution to the economy.

Analysis of the performance of the agricultural sector with data obtained from Central Bank of Nigeria's statistical publications using the econometric technique reveals the following:

1. The agricultural sector contributes immensely to the economic growth of Nigeria. However, the over dependence on the oil sector has over shadowed the potentials of the sector.
2. It was also found that Nigeria's agricultural sector recorded a modest improvement in overall

performance in recent years. However, much of this improvement was masked in wide periodic fluctuations in performance, which was an evidence of serious economic instability in the sector, that is, the perpetual power outage, bad road networks, unreliable medical facilities, lack of other infrastructural facilities e.t.c.

3. The Nigeria'- agricultural policy framework was found to have undergone a number of evolutionary processes and fundamental changes but these did not impact significantly on the performance of the agricultural sector.

Conclusion

The empirical results showed that the Nigeria's agricultural sector has contributed immensely to the growth of the economy. This reveals to us that the role of the agricultural sector in the economic growth and development of a nation cannot be over-emphasized. Besides, the results of the findings further revealed that the Nigeria's agricultural sector recorded a modest improvement in overall performance in recent years. The results could have been better but for the structural rigidity that exists in the system – there are no good roads for distribution of goods and services: - the power supply is epileptic and so production process is not facilitated. The demand for agricultural produce has fallen because most manufacturing firms have shut down because of the huge running costs. The massive importation of manufactured goods that were previously produced locally also contributed to the poor performance of the manufacturing sector. The ban on some manufactured goods by the government has not yielded the desired results because some of the banned goods still find their way into the local markets, no thanks to corruption.

Although, the export of Nigeria has since the 1970s been dominated by oil export, the non-oil export especially agriculture still play a crucial role. This has been empirically proven. In this regard it can be concluded that the government should further strengthen this sector in order to have more positive contribution of the sector to the development of Nigerian economy. The government would have to enforce zero tolerance policies that would bring back to life the agricultural sector so that the potentials of the sector could be fully realized. The continuous reliance on the oil sector would spell doom for the nation. The teeming population of unemployed youths could be gainfully employed in

the agricultural sector if the right environment is provided for the sector to thrive.

The government and the relevant monetary authorities have a lot to do in this area in order to redirect money not directly in their control to boost the agricultural sector. A direction may be given to all financial institution to design their lending pattern in favour of this crucial sector. It is when the productivity of the agricultural sector is improved that the non-oil export could be competitive on the international scene.

Recommendations

Nigeria's agriculture has a very bright future now than it has had since independence and hopes are high following good harvest in recent years. However, it is now at difficult cross roads, not sure which path to follow in preparation for the even more problematic and severely competitive twenty-first century. As the reality of a need to diversify the Nigerian economy stares us in the face, it might be worthwhile to consider the following recommendations/proposals:

- The only alternative to oil as an active foreign exchange earner is non-oil (including agricultural) exports. In order to derive the maximum benefits from agricultural produce, it is important to consciously work for it. The evolution of an agricultural policy therefore becomes imperative and immediate.
- New incentives must be evolved that will radically change the national orientation towards agriculture or farming. There is no doubt that with a total involvement of the active population in agricultural production, the sector can replace oil soonest.
- The activities of agriculture financing institutions in providing finance and credit for rural farmers, should be supplemented by the provision of road networks, rail system and warehouses, in order to further encourage farmers to increase their production.
- Existing agricultural promotion scheme/agencies especially the Agricultural Credit Guaranteed Scheme Fund (ACGSF) and the Small and Medium Scale Industries Equity Investment Scheme (SMIEIS) need to be well funded with the new seven point agenda of the present administration in view.
- Revisiting some macroeconomic policies that are capable of introducing disincentives to agriculture e.g. the issue of higher protection given to the industrial sector and some elements of the Structural Adjustment Programme (SAP).

Here government would invest an appropriate percentage of its foreign exchange earnings in agriculture to ensure for instance that the farmers receive all the input they need.

References

- Adunbi A.A (1996) "The Design and Management of Sectoral policies in Nigeria: Agriculture and the Economic Reform Programme" In Obadan M.I and M.A. Iyoha edited *Macroeconomic Policy Analysis :Tools Techniques and Applications to Nigerian*. NCEMA, Ibadan. Pg 360 -385
- Agu, C. C. (2004) "An Overview of the Contributions of the Private Sector to Economic Growth in Nigeria". CBN's Proceedings of the Thirteenth Annual Conference of the Regional Research Units: Enhancing Private Sector-Led Growth in Nigeria, pp 47-60.
- Aribisala, T.S.B. (1983) "Nigeria's Green Revolution: Achievements, Problems and Prospects". Distinguished Lecture No. 1, Nigerian Institute of Social and Economic Research (NISER), Ibadan, Nigeria.
- Aryeetey, E. (1996) "Rural finance in Africa: Institutional developments and access for the poor". The World Bank Annual Conference on Development Economics, 25–26 April, Washington, D.C.
- Aryeetey, E. and Gockel, F. (1991) "Mobilising domestic resources for capital formation in Ghana: The role of informal financial sectors". *AERC Research Paper*, No. 3.
- Aryeetey, E.; Hettige, H.; Nissanke, M. and Steel, W. (1997) "Financial market integration and reforms in Ghana, Malawi, Nigeria and Tanzania". *World Bank Economic Review*, Vol. 11, No. 2, pp. 195–218.
- Aryeetey, E. and Udry, C. (1997) "The characteristics of informal financial markets in sub-Saharan Africa". *Journal of African Economies*, Vol. 6, No. 1.
- Bell, C. (1988) "Credit markets and interlinked transactions. In H. Cheury and T.N. Srinivasan, eds., *Handbook of Development Economics*, vol 1, North Holland.
- Besley, T. (1994) "How do market failures justify intervention in rural credit markets?" *The World Bank Research Observer*, Vol. 9, No. 1, pp. 27–47.
- Boyede, O. (1999) "Production of Non-oil Exports: A must Step in Economic Revitalisation"

- Nigerian Business Tribune. January 13.
- Central Bank of Nigeria (2010) *Statistical Bulletin*. Abuja: Central Bank of Nigeria.
- Central Bank of Nigeria (2010) *Annual Report for the Year Ended 31st December*. Abuja: Central Bank of Nigeria.
- Ellis, F. (1988) *Peasant Economics: Farm Households and Agrarian Development*. Cambridge: University Press.
- Essien, E. A. (2005) "A consistent macroeconomic Framework for the Agricultural Sector under the National Economic Empowerment and Development Strategy (NEEDS)". *CBN Bullion*, Vol. 29, No. 4.
- Fakayode, B. S., Omotesho, O. A., Tsoho, A. B. and Ajayi, P. D. (2008) "An Economic Survey of Rural Infrastructures and Agricultural Productivity Profiles in Nigeria". *European Journal of Social Sciences*, Vol. 7, No. 2, pp. 158-171.
- Gollin, D. (2009) Agriculture as an Engine of Growth and Poverty Reduction: What We Know and What We Need to Know. A Framework Paper for the African Economic Research Consortium Project on "Understanding Links between Growth and Poverty Reduction in Africa".
- Gollin, D. and Rogerson, R. (2010) Agriculture, Roads, and Economic Development in Uganda. *NBER Program on African Successes*, pp. 1-61.
- Ikpi, A. (2001) Nigeria's Agriculture Sector Assessment: Issues of Technology Development and Transfer (Revised Final Report), United States Agency for International Development, Washington DC, USA.
- Ikpi, A. E. and Ikpi, A. L. (1998) "Governments and Agricultural Research Funding in sub-Saharan Africa". An invited paper presented at an IITA workshop on The Role of African Governments in Agricultural Research. IITA, Ibadan, May 17-20.
- Jhingan, M. L. (2001) *Advanced Economic Theory*. Delhi: Vrinda Publications (P) Limited.
- Manyong, V. M.; Ikpi, A.; Olayemi, J. K.; Yusuf, S. A.; Omonona, R. and Idachaba, F. S. (2003) Agriculture in Nigeria: Identifying Opportunities for Increased Commercialization and Investment. Report Prepare from International Institute of Tropical Agriculture (IITA), in collaboration with University of Ibadan (UI) for USAID/Nigeria. November.
- Meijerink, G. and Roza, P. (2007) "The role of agriculture in development". *Markets, Chains and Sustainable Development Strategy and Policy Paper*, No. 5, pp. 1-33.
- Muhammad-Lawal, A. and Atte, O. A. (2006) "An Analysis of Agricultural Production in Nigeria". *African Journal of General Agriculture*, Vol. 2, No. 1, pp. 1-6.
- Nagarajan, G., Meyer, R. L. and Hushak, L. J. (1995) "Demand for agricultural Loans: A theoretical and empirical analysis". *Department of Agricultural Economics, Ohio State University, USA Economic and Sociology Paper*, No. 2233.
- Nissanke, M. and Aryeetey, E. (1995) "Financial integration and development in sub-Saharan Africa". Report prepared for the African Technology Department, AFTPS, Washington, D.C.: The World Bank.
- Nwosu, A. C. (2005) "Private Sector Initiatives in Agricultural Development in Nigeria". CBN's Proceedings of the Thirteenth Annual Conference of the Regional Research Units: Enhancing Private Sector-Led Growth in Nigeria, pp 97-111.
- Obadina, T. (1999) "Nigeria's economy at the crossroads New government faces a legacy of mismanagement and decay". *Journal of Africa Recovery*, June.
- Ogen, O. (2007) "The Agricultural Sector and Nigeria's Development: Comparative Perspectives from the Brazilian Agro-Industrial Economy, 1960-1995". *Nebula*, Vol. 4.1, pp. 184-194.
- Ogunlela, Y. I. and Mukhtar, A. A. (2009) "Gender Issues in Agriculture and Rural Development in Nigeria: The Role of Women". *Humanity and Social Sciences Journal*, Vol. 4, No. 1, pp. 19-30.
- Ojo, M. O. and Akanjo, O. O. (1996) "The Impact of Macroeconomic Policy Reforms on Nigerian Agriculture". *CBN Economic and Financial Review*, Vol. 34, No. 2.
- Okuneye, B. (2002) "Livestock Sub-sector in Nigeria: Challenges & Prospect". *CBN Bullion*, Vol. 26, No. 3.
- Ojo, M. O.; Balogun E. D. and Evbuomwan, G. O. (1992) "Sustaining Agricultural Production in a Deregulated Economy". *CBN Economic & Financial Review*, Vol. 31, No. 2, pp. 71-85.

- Oladipo, J. A. (2008) "Agro-Industry as Strategy for Rural Development: An Impact Assessment of Nigeria Oil-Palm Industry". *European Journal of Social Sciences*, Vol. 7, No. 1, pp. 75-87.
- Olayiwola K. and Okodua H. (2009) "Foreign Direct Investment, Non-Oil Exports, and Economic Growth in Nigeria: A Causality Analysis". Department of Economics and Development Studies Covenant University, Ota, Nigeria.
- Omene, G. E. (2002) "Solid Minerals Oil & Gas: Key To The Economy". Being a Distinguished Lecture presented to the Metallurgical and Mining Division of the Nigerian Society of Engineers at Abuja on 26th September.
- Rahji, M.A.Y and Adeoti, A. I. (2010) "Determinants of Agricultural Credit Rationing by Commercial Banks in South-Western, Nigeria". *International Research Journal of Finance and Economics*, Issue 37, pp. 7-14.
- Ross, M. L. (2003) "Nigeria's Oil Sector and the Poor". Prepared for the UK Department for International Development "Nigeria: Drivers of Change" program. UCLA Department of Political Science Los Angeles, CA.
- Stiglitz, J. E. and Weiss, A. (1981) "Credit rationing in markets with imperfect information". *American Economic Review*, Vol. 71, No. 3, 393 and 410.
- Stringer, R. and Pingali, P. (2004) Agriculture's Contributions to Economic and Social Development. *Electronic Journal of Agricultural and Development Economics*, Vol. 1, No. 1, pp. 1-5.
- Todaro, M. P. and Smith, S. C. (2003) *Economic Development, Eighth Edition*.
- Udry, C. (1994) "Risk and insurance in a rural credit market: An empirical investigation in northern Nigeria". *The Review of Economic Studies*, Vol. 61, No. 495 and 526.
- Ukeje, E. U. (1999) "Productivity in the agricultural sector". A Paper presented by the Assistant director, research department, Central Bank of Nigeria.
- Ukeje, S. A. (2002) "Incentives for Private Sector Development in Nigeria". CBN's Proceedings of the Thirteenth Annual Conference of the Regional Research Units): Enhancing Private Sector-Led Growth in Nigeria, pp 177-207.
- Ukpong, G. E. (1992) "Some Strategies for the Development of Nigeria's Agricultural Sector in the 1990s". *CBN Economic and Financial Review*, Vol. 31, No. 2, pp. 86-109.
- Utomi, P. (2004) "The Curse of Oil". A Paper delivered for Heinrich Böll Foundation Oil-Conference by Lagos Business School, May

APPENDIX

Regression Data for the Role of Agricultural Sector in Accelerating Economic Growth and Development in Nigeria (1970 – 2010)

Year	gdp (N'million)	out _{ag} (million tons)	ag _{gdp} (N'million)	ind _{agr} (1990=100)	rAgGDP
1970	4219	37.0088	1887.7	75.22	.0088
1971	4715.5	32.7126	1985.2	68.18	.0069
1972	4892.8	25.2672	1861.1	56.12	.0052
1973	5310	28.1423	1808.7	61.01	.0053
1974	15919.6	34.0754	3658.33	70.87	.0021
1975	27172	28.806	7639.41	62.27	.0011
1976	29146.5	25.952	6838.44	58.27	.0009
1977	31520.3	25.3471	7401.64	57.73	.0008
1978	29212.3	23.9311	6712.99	55.82	.0008
1979	29947.9	23.1772	6033.46	55.16	.0008
1980	31546.7	23.7345	6501.83	55.22	.0008
1981	205222	24.14	57989.67	56.84	.0001
1982	199685.2	24.672	59450.83	58.69	.0001
1983	185598.1	14.496	59009.56	56.06	.0001
1984	183562.9	37.395	55918.17	59.7	.0002
1985	201036.2	39.913	65748.44	62.45	.0002

1986	205971.4	41.712	72135.23	64.66	.0002
1987	204806.5	46.27	69608.06	66.9	.0002
1988	219875.6	56.864	76753.72	69.29	.0003
1989	236729.5	63.526	80878.04	95.14	.0003
1990	267549.9	67.328	84344.61	100	.0003
1991	265379.1	79.473	87503.53	111.54	.0003
1992	271365.5	87.312	89345.43	119.22	.0003
1993	274833.2	90.147	90596.51	122.59	.0003
1994	275450.5	93.25	92832.95	126.42	.0003
1995	281407.4	95.556	96220.67	128.49	.0003
1996	293745.3	100.971	100216.18	134.43	.0003
1997	302022.4	103.859	104514	137.73	.0003
1998	310890	107.703	108814.07	141.04	.0003
1999	312183.4	111.515	114570.71	145.2	.0004
2000	329178.7	117.876	117945.07	149.2	.0004
2001	356994.2	103.635	122522.34	148.9	.0003
2002	433203.5	107.5725	190133.4	179.9	.0002
2003	477532.9	115.3041	203409.87	190.9	.0002
2004	527576	125.0849	216208.47	201.8	.0002
2005	561931.4	129.5335	231463.61	186.9	.0002
2006	595821.61	134.6303	248598.96	200.1	.0002
2007	634251.37	143.5977	266477.18	212.8	.0002
2008	672202.55	153.9694	283175.43	226.7	.0002
2009	718977.33	163.5082	299823.86	242.1	.0002
2010	775525.7	172.9397	316728.69	255.9	.0002

Source: Central Bank of Nigeria Statistical Bulletin; Central Bank of Nigeria Annual Report and Statement of Accounts for various years

- Where gdp - Gross Domestic Product (GDP) at 1990 Constant Basic Prices
- out_{ag} - Output of the Agricultural Sector
- ag_{gdp} - Share of agriculture in the GDP at 1990 base year
- ind_{agr} - Index of Agricultural production at 1990 base year
- $rAgGDP$ - Ratio of agricultural output to GDP

Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	ag_{gdp} out_{ag}	.	Enter

a. All requested variables entered.

b. Dependent Variable: gdp

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.994 ^a	.988	.987	24344.16222	.521

a. Predictors: (Constant), ag_{gdp} , out_{ag}

b. Dependent Variable: gdp

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.8E+012	2	9.027E+011	1523.161	.000 ^a
	Residual	2.3E+010	38	592638234.3		
	Total	1.8E+012	40			

a. Predictors: (Constant), aggdg, outag

b. Dependent Variable: gdp

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	24339.158	8288.946		2.936	.006
	outag	364.870	220.542	.079	1.654	.106
	aggdp	2.158	.112	.920	19.209	.000

a. Dependent Variable: gdp

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	37573.88	770806.6	268149.1	212448.07248	41
Residual	-40613.3	46957.64	.00000	23727.75427	41
Std. Predicted Value	-1.085	2.366	.000	1.000	41
Std. Residual	-1.668	1.929	.000	.975	41

a. Dependent Variable: gdp

Regression**Variables Entered/Removed^a**

Model	Variables Entered	Variables Removed	Method
1	raggdg _g indagr	.	Enter

a. All requested variables entered.

b. Dependent Variable: gdp

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.965 ^a	.931	.928	57523.44071	.381

a. Predictors: (Constant), raggdg, indagr

b. Dependent Variable: gdp

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.7E+012	2	8.511E+011	257.204	.000 ^a
	Residual	1.3E+011	38	3308946231		
	Total	1.8E+012	40			

a. Predictors: (Constant), raggdg, indagr

b. Dependent Variable: gdp

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-65392.8	22135.582		-2.954	.005
	indagr	3089.549	157.138	.881	19.661	.000
	raggdg	-2E+007	4950413	-.205	-4.574	.000

a. Dependent Variable: gdp

Residuals Statistics^a

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-31600.2	720174.0	268149.1	206285.45975	41
Residual	-89182.2	97667.99	.00000	56066.91466	41
Std. Predicted Value	-1.453	2.191	.000	1.000	41
Std. Residual	-1.550	1.698	.000	.975	41

a. Dependent Variable: gdp