



AN ASSESSMENT OF THE RESPONSE OF AGRICULTURE TO GOVERNMENT POLICIES AND PROGRAMMES IN NIGERIA (1981-2019)

¹Aliyu A. Ammani and ²Abubakar A. Hassan

¹National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria-Nigeria.

²Department of Agricultural Economics, Ahmadu Bello University, Zaria-Nigeria

*Corresponding Author: aaammani@yahoo.co.uk +2348023580413

ABSTRACT

Over the years, the federal government introduced a number of policies and programmes aimed at increasing production and productivity as well as making Nigeria self-sufficient in food production. This study was aimed at establishing whether or not the series of agricultural policies formulated and implemented since 1981 in Nigeria has significantly improved the performance of the Nigerian agricultural sector. To achieve the objectives of this study, policies and programmes implemented from 1981 to 2019 were categorised into 4 based on the period of formulation and implementation: 1981-1986 period, 1987-1998 period, 1999-2015 period and the period 2015 – 2019. Time series data on the GDP of the agriculture sector in Nigeria for the period 1981-2019 were collected and used as proxies for the performance of the Nigerian agriculture sector. Dummy variables representing each of the four aforementioned periods were defined and used as independent variables. Multiple regression was used to analyse the collected data. Findings of the study revealed that only the series of agricultural policies and programmes implemented in the last 2 of the 4 periods had significant and positive effect on the performance of the Nigerian agricultural sector. It is recommended that further studies into the response of Nigerian Agriculture to the policies formulated and implemented in the period 1981-1998 should be undertaken by agricultural economists to shed more light.

Key words: agriculture, policy, programmes, performance, production, productivity, Nigeria

INTRODUCTION

Agriculture is the backbone of national economies. As observed by Haifa (1998), mankind could not exist and non-agricultural sectors could not be developed without agriculture. Several studies have established the relationship between agricultural growth and economic development (Brooks, 2006; Food and Agriculture Organisation, FAO, 2004; Hazell and Diao, 2005). In fact, according to World Bank (2008), growth in the agricultural sector contributes proportionally more to poverty reduction than growth in any other economic sector. This position was further reaffirmed by Meijerink and Roza (2007). Studies identified edaphic, climatic, biotic and socioeconomic factors as key determinants of agricultural performance globally (Ruthenberg, 1971; Reijntjes *et al.*, 1992; Dixon *et al.*, 2001; Flora, 2001). Schultz (1976), while delivering the first Leonard Elmhirst Lecture, challenged agricultural economists to evaluate the economic effects of what governments 'do to agriculture' arguing that much of the difference in the economic performance of the agricultural sector is a consequence of what governments 'do to agriculture'. What governments 'do to agriculture', refers to its policy on agriculture. Policy, in the words of Dye (2013), is "whatever governments choose to do or not to do". Agricultural policy as defined by Waldt (2001), is "the formal articulation, statement, or publication of a goal that the government intends to pursue" in order to address

a need or a problem. Agricultural policies are usually implemented through programmes. A programme is an elaborate plan (Kirkpatrick, 1987), a comprehensive plan with clearly stated objectives to be attained, specifications of resources required and stages of work to be performed (Asiabaka, 2002).

Agriculture was the backbone of Nigeria's economy at independence in 1960. It provided the stimulus for Nigeria's overall economic growth through exports, employment to over 75% of the population and food for over 70% of the population, raw materials for industry as well as foreign exchange (Ilugbuhi, 1968; Reynolds, 1966; Alamu, 1981). However, by 1981, the Nigerian agricultural sector began to decline (Abdullahi, 1981). To boost the agricultural production base of the country, the federal government introduced a number of policies and programmes aimed at increasing production and productivity as well as making Nigeria self-sufficient in food production. Four categories of such policies and programmes can be identified between 1981 and 2019.

During the period from 1981 to 1986 marked by the decline of Nigerian agriculture which became evident after the oil boom period. As observed by Abdullahi (1981), "Nigeria can no longer produce enough food for its fastgrowing population neither could the agricultural system cope with the increasing demands of the agricultural raw materials to keep the country's oil mills, textile and other agro-based industries

operating at full capacity let alone have surpluses for export. In fact, many of the agro-based industries which once depended on locally produced raw materials are closing down unless of course they are allowed to import part or all of these raw materials from abroad. Numerous other parameters point to the obvious and undeniable fact that the country is ‘progressively’ becoming unable to cope with the overall needs of its food and raw materials”. The period coincided with the peak of the Nigerian Green Revolution programme launched in April 1980 with the goal of boosting agricultural production and ensuring that Nigeria become self-sufficient in respect of basic foods in five years and returning to its preeminent position as an agriculture exporting country in seven years (Oyatoye, 1983).

The period 1987-1998 started with the launching of the Nigeria’s Structural Adjustment Programme (SAP), (1987-1992) with the broad objective of restructuring and diversifying the productive base of the economy in such a way as to reduce dependency on the oil sector and imports (Moser *et al.*, 1997); and its variants especially the zero subsidy fertiliser policy of 1995.

The period 1999-2015 marked the return of democracy in Nigeria.. The period witnessed policies and programmes such as Presidential Initiatives on Agriculture (PIA) 2001-2007; National Economic Empowerment and Development Strategy (NEEDS) of 2004 and its corresponding lower variants SEEDS and LEEDS for states and local governments respectively; the National Programme for Food Security (NPFS) 2008-2013 which was an expanded phase of the Special Programme for Food Security (SPFS) implemented from 2002 to 2006; National Food Security Programme (2008), National Fadama II Programme (2005), the Agricultural Transformation Agenda (ATA) Programme of 2011 with a vision “to achieve a hunger-free Nigeria through an agricultural sector that drives income growth, accelerates achievement of food and nutritional security, generates employment and transforms Nigeria into a leading player in global food markets to grow wealth for millions of farmers” (Anyanwu *et al.*, 2011; National Population Commission, NPC, 2004; Federal Ministry of Agriculture and Rural Development, FMARD, 2011).

For the period 2016-2019, the Central Bank of Nigeria (CBN) policy initiative, Anchor Borrowers’ Programme (ABP), alongside the closure of Nigeria’s land borders, were the main thrust of the Buhari’s administration that affects agricultural production. The ABP was launched on the 17th of November 2015 aimed at the creation of jobs, reduction in food import and diversification of our economy through increasing output and significantly improving capacity utilization of integrated mills (CBN, 2015). The programme thrust of ABP is the provision of

farm inputs in kind and cash (for farm labour) to small holder farmers to boost production of the identified commodities, stabilize input supply to agro-processors and address the country’s balance of payments in food (CBN, 2016). One of the key expected outcomes of the ABP is to increase output per hectare of selected commodities to international standards (CBN, 2015). The 2016-2025 Agriculture Sector Food Security and National Strategy Programme is another important programme (FMARD, 2016; FMARD, 2017).

The problem that arises for this study is: whether or not the series of agricultural policies and programmes formulated and implemented since 1981 in Nigeria have significantly improved the performance of the Nigerian agricultural sector. Specifically, this study (i) described the output of the agricultural sector in Nigeria over the period 1981-2019, and (ii) investigated the relationship between the output of the Nigerian agricultural sector and the gamut of agricultural policies and programmes formulated and implemented during the following four periods 1981-1986, 1987-1998, 1999-2015 and 2016-2019. This study is expected to modestly contribute to the literature on our understanding of the effects of government policies on agricultural crop production in Nigeria which would hopefully provide insights for policy-makers that could lead to the formulation of better agricultural policies in Nigeria.

METHODOLOGY

Data: Time series data on the gross domestic product (GDP) of the Agriculture sector in Nigeria for the period 1981-2019 were collected from CBN (2021) and used as proxies for government policies and programmes in the Nigerian agricultural sector.

Analytical Techniques: Descriptive statistics and regression analysis were used to achieve the objectives (i) and (ii) of this study respectively.

The Regression Model: A multiple regression model was employed for this study because it suits the study’s objectives of explaining the relationship between output of the Nigerian agriculture sector and the gamut of agricultural policies and programmes implemented in Nigeria from 1987 to 2019. The following regression model was developed, estimated and used in this study.

$$Y_t = \beta_0 + \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \mu_t \quad (1)$$

Where:

Y_t = GDP of the Nigerian agricultural sector in year t (measured ₦’Billion 2010 Constant Basic Prices)

β_0 = the intercept or constant term which doubled as the coefficient of the dummy variable for the period 1981-1986

$D_{1t} = 1$ if for the period 1987-1998
 $= 0$ if otherwise

$D_{2t} = 1$ if for the period 1999-2015
 = 0 if otherwise
 $D_{3t} = 1$ if for the period 2016-2019
 = 0 if otherwise

Various literature noted the challenges faced in empirical analysis of time series data due to the assumption that the underlying time series is stationary (Enders, 1995; Patterson, 2000; Seddighi *et al.*, 2000). As observed by Gujarati (2003), establishing stationarity of the residuals from regression equation, makes the traditional regression methodology applicable to data involving non stationary time series. For the purpose of this study, cointegration was tested on the collected data using the Cointegrating Regression Durbin-Watson (CRDW) Test method as expounded by Gujarati (2003). The computed DW d (0.440) obtained from the cointegrating regression is greater than the critical value of 0.386 at the 5% level, thus it was concluded that the regression residuals are stationary. However, the computed DW d value of 0.440 is lower than the critical DW dL value of 1.318, indicating an evidence of positive first order serial correlation (Appendix Table A1). The first-order difference transformation method was used to remedy the detected autocorrelation problem as it is found appropriate for our case in addition to its other advantages. This decision was guided by Maddala (1992) rule of thumb on the appropriateness of using the first-order difference method of using the first difference transformation method whenever $d < R^2$; and our computed DW d was 0.440 while our R^2 was 0.797.

The regression equation (1) becomes the following no-intercept regression (2) which was estimated using the transformed data. Because the regression equation has no intercept or constant term, the

dummy variable for the period 1981-1986 was introduced into equation (2).

$$Y_t = \beta_1 D_{1t} + \beta_2 D_{2t} + \beta_3 D_{3t} + \beta_4 D_{4t} + \mu_t \quad (2)$$

Where:

Y_t = GDP of the Nigerian agricultural sector in year t (measured ₦' Billion 2010 Constant Basic Prices)

$D_{1t} = 1$ if for the period 1981-1986
 = 0 if otherwise

$D_{2t} = 1$ if for the period 1987-1998
 = 0 if otherwise

$D_{3t} = 1$ if for the period 1999-2015
 = 0 if otherwise

$D_{4t} = 1$ if for the period 2016-2019
 = 0 if otherwise

RESULTS AND DISCUSSION

Output of the agricultural sector in Nigeria over the period 1981-2019 is depicted in Fig 1. Sectorial out for agriculture has been generally on the increase from 1981 to 2019, with slight drop in 1984 and 1987. An impressive leap was recorded from the year 2002. The slight drops recorded in 1984 and 1987 could be attributed to the drastic economic measures taken by the then new federal military government of Nigeria in 1984 and the Structural Adjustment Programme introduced on 1987

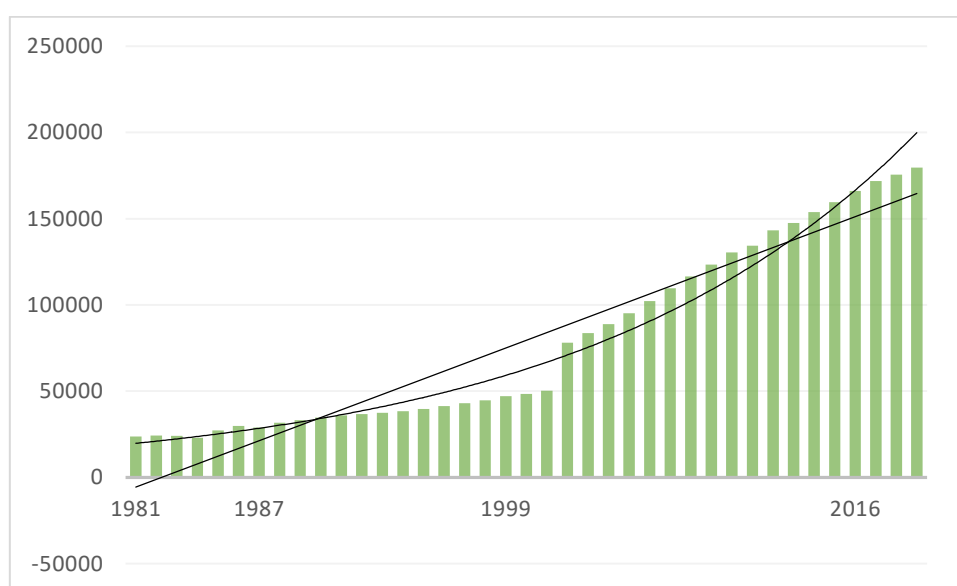


Figure 1: Output of the Nigerian Agriculture Sector (1981-2019) at 2010 Constant Basic Prices (₦ Billion).

The regression model (eqn 2) was estimated and results presented in Table 1. The F value of 13.216 computed was highly significant at the 5% level. This implies that the included explanatory variables as represented by the 4 dummy variables together significantly explain the variation in output of the Nigerian agricultural sector over the period covered in the study. The R^2 value obtained from the equation is 0.609. This would have indicated that the explanatory variables included in the model explained, on the average, about 61% of the variation in the output of the agricultural sector over the study period. However, as noted in the literature, for regression through the origin (the no-intercept model), R^2 measures the proportion of the variability in the dependent variable about the origin explained by regression, therefore cannot be compared to R^2 for equations and models which include a constant term or intercept (Wooldridge, 2006; Gujarati and Porter, 2009;).

The computed β_1 , the coefficient of the dummy variable for the period (1981-1986) is found to be not significant when viewed in relation to the computed p-value of 0.504, hence the null hypothesis is accepted and it is thus concluded that there is a no significant relationship between the output of the Nigerian agricultural sector and the gamut of agricultural policies and programmes in force during the period 1981-1986. This finding indicates that increased agricultural output was not obtained from the then prevailing agricultural policies and programmes.

The computed value for β_2 , the coefficient of the dummy for policies and programmes in force during the period 1987-1998, is found to be not significant when viewed in relation to the computed p-value of 0.306, hence the null hypothesis is accepted and it is thus concluded that there is no significant relationship between the output of the Nigerian

agricultural sector and the gamut of agricultural policies and programmes in force during the period 1987-1998. This finding indicates the absence of statistically significant evidence to argue that increased agricultural output resulted from the agricultural policies and programmes in place during the period 1987-1998. Considering the fact that the structural adjustment programme (SAP) was the main thrust of all agricultural policies and programmes implemented in Nigeria during the period (Moser *et al.*, 1997), this finding could be attributed to the circumstances of SAP, the implementation of which was reported to have no significant effect on agricultural productivity and growth (Kwanashie *et al.*, 1997; Kwanashie *et al.*, 1998).

The estimated value for β_3 , the coefficient of the dummy for policies and programmes in force during the period 1999-2015, is found to be highly significant when viewed in relation to the computed p-value of 0.000. The null hypothesis is therefore rejected and it is thus concluded that there is a highly significant relationship between the output of the Nigerian agricultural sector and the array of agricultural policies and programmes implemented during the 1999-2015 period. This finding indicates that increased agricultural output resulted from the then prevailing agricultural policies and programmes.

The null hypothesis is rejected and it is therefore concluded that there is a significant relationship between the output of the Nigerian agricultural sector and the variety of agricultural policies and programmes in force during the period 2016–2019. The computed value of β_4 , the coefficient of the dummy variable for policies and programmes in force during the period 2016–2019, is found to be significant when viewed in relation to the computed p-value of 0.021. This finding suggests that the then prevailing agricultural policies and programs were responsible for the increased agricultural output.

Table 1: Results of Analysis of the Second Level Estimated Regression Model

Independent variables	Coefficient [†]	Std. Error	p-value
Dummy for the Period (1981-1986)	124.600	184.704	0.504
Dummy for the Period (1987-1998)	124.000	119.226	0.306
Dummy for the Period (1999-2015)	675.118 ^{**}	100.170	0.000
Dummy for the Period (2016-2019)	501.750 [*]	206.505	0.021

R = 0.780; $R^2 = 0.609$ Adjusted $R^2 = 0.563$; F (model) = 13.216; p-value for F(model)=0.000. DWd = 2.329 [†]Unstandardized ^{**}Highly significant ^{*}Significant at 5%

CONCLUSION AND RECOMMENDATIONS

This study set out to investigate whether or not the series of agricultural policies formulated and implemented since 1981 in Nigeria has significantly improved the performance of the Nigerian agricultural sector. Four periods were examined:

1981-1986 period, 1987-1998 period, 1999-2015 period and the period 2015 – 2019. Findings of the study reveals that series of agricultural policies and programmes implemented in the last 2 of the 4 periods had significantly and positively impacted on the performance of the Nigerian agricultural sector.

Reasons for the inability of the policies and programmes of the 1981 through 1998 period to significantly and positively affect the performance of the agricultural sector in Nigeria are not clear. However, the period 1981-1998 could be seen as the 'seeding period' when resources were invested in form of policies, while the post 1999 period was the fruition period when the investments in the policies of the earlier periods combined to start yielding results. This study therefore recommends that further studies into the response of Nigerian Agriculture to the policies formulated and implemented in the period 1981-1998 should be undertaken by policy researchers to shed more light.

REFERENCES

- Abdullahi, A. (1981). The Problems and Prospects of the Green Revolution for Agricultural and Rural Development of Nigeria: Technical and Environmental Perspectives. In Abalu, G.O.I., Abdullahi, Y. and Imam. A. M. (Eds). *The Green Revolution in Nigeria?* Proceedings of a National Seminar organised by the Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University and held in Zaria, Nigeria from September 21st – 24th. pp 1-11
- Alamu, J. F. (1981). Small-Scale Mechanised Farming: The only Hope of the Current Green Revolution in Nigeria. In Abalu, G.O.I., Abdullahi, Y. and Imam. A. M. (Eds). *The Green Revolution in Nigeria?* Proceedings of a National Seminar organised by the Department of Agricultural Economics and Rural Sociology, Ahmadu Bello University and held in Zaria, Nigeria from September 21st – 24th. pp 132-139
- Anyanwu, C. M., Amoo, B. A. G., Odey, L. I. and Adebayo, O. M. (2011). An Assessment of the Operations of the Presidential Initiatives on Agriculture in Nigeria: 2001-2007. *Occasional Paper No. 40*. Abuja: CBN
- Asiabaka, C.C. (2002), *Agricultural Extension; A Handbook for Development Practitioners*. Omoku, Rivers: Molsystem United Services.
- Brooks, K. (2006). *Beyond Agriculture: the promise of the rural economy for growth and poverty reduction*. Rome: FAO.
- CBN (2015): *Anchor Borrowers' Programme ABP: A Financing Model for Small Holder Farmers*. Abuja: CBN
- CBN (2016): *Anchor Borrowers' Programme Guidelines*. Abuja: CBN
- CBN (2021). Statistical Bulletin (Real Sector). Retrieved from www.statistics.cbn.gov.ng/cbn-onlinestats on the 27th of November 2021 at 23:54
- Dixon, J. and A. Gulliver with D. Gibbon. (2001). *Farming Systems and Poverty: Improving Farmers' Livelihoods in a Changing World*. FAO & World Bank, Rome, Italy & Washington, DC, USA
- Dye, T. R. (2013). *Understanding public policy 14th edn*, New Jersey: Pearson Education
- Enders, W. (1995). *Applied Econometric Time Series*. New York: John Wiley and Sons
- FAO. (2004). *Socio-Economic Analysis and Policy Implications of the Roles of Agriculture in Developing Countries*. FAO Research Programme Summary Report. Rome: FAO
- Flora, C. (2001). *Interactions between Agroecosystems and Rural Communities: Advances in Agro-ecology*. Boca Raton, FL: CRC Press.
- FMARD (2017) *Agricultural Sector Food Security and Nutrition Strategy 2016 – 2025*. FMARD: Abuja
- FMARD (2016). *The Agriculture Promotion Policy (2016 – 2020) Building on the Successes of the ATA, Closing Key Gaps Policy and Strategy Document*. FMARD: Abuja
- FMARD (2011). *Agricultural Transformation Agenda: We Will Grow Nigeria's Agricultural Sector (Draft)*. Abuja: FMARD.
- Gujarati, D. N. (2003). *Basic Econometrics. 4th edn*. New Delhi: Tata McGraw-Hill
- Gujarati, D. N. and Porter, D. C. (2009), *Basic Econometrics 5th Edition*. Boston: McGraw-Hill
- Haifa F. (1998) *Agricultural Development in The Netherlands an Analysis of the History of Dutch Agricultural Development and its importance for China*. *Interne Nota 491*. Agricultural Publishing House
- Hazell, P. and X. Diao. (2005). "The Role of Agriculture and Small Farms in Economic Development". Proceedings of a Research Workshop, Wye, UK, June 26–29, 2005. IFPRI Washington, DC.
- Ilugbuhi, T. O. (1968). Nigeria's Experience in Domestic Financing of Development. *Research Memo series*. Zaria: Institute of Administration
- Kirkpatrick T.O. (1987), *Supervision*. Kent Publishing Company: Boston
- Kwanashie, M., Garba, A. and Ajilima, I. (1997). Policy modelling in agriculture: Testing the response of agriculture to adjustment policies in Nigeria. *AERC Research Paper 57*. African Economic Research Consortium: Nairobi

- Kwanashie, M., Ajilima, I. and Garba, A. (1998). The Nigerian economy: Response of agriculture to adjustment policies. *AERC Research Paper 78*. African Economic Research Consortium: Nairobi.
- Meijerink, G. and Roza, P. (2007). The role of agriculture in development. Markets, Chains and Sustainable. *Development Strategy and Policy Paper, no. 5*. Stichting DLO: Wageningen. Available at: <http://www.boci.wur.nl/UK/Publications/>
- Maddala, G. S. (1992). *Introduction to Econometrics, Second Edn*. New York: Macmillan
- Moser, G.G., S. Rogers and Van Til, R. (1997). *Nigeria: Experience with Structural Adjustment*. Washington DC: IMF
- NPC (2004). *The National Economic Empowerment and Development Strategy (NEEDS)*. Abuja: National Population Commission
- Oyatoye, E. T. O. (1983). The Green Revolution Programme in Nigeria Some Observations. *Ife Journal of Agriculture* 5 (1&2), 56-74
- Patterson, K. (2000). *An Introduction to Applied Econometrics: A Time Series Approach*. New York: St. Martin's Press
- Reijntjes, C., B. Haverkort, and A. Waters-Bayer. (1992). *Farming for the Future: An Introduction to Low-External-Input and Sustainable Agriculture*. London: McMillan Press.
- Reynolds, L. C. (1966). *Peasant Agriculture and Economic Growth in Nigeria*. The Economic Growth Center, Yale: Yale University
- Ruthenberg, H. (1971). *Farming Systems in the Tropics*. Oxford: Clarendon Press
- Schultz TW (1976). The First Leonard Elmhirst Memorial Lecture: On Economics, Agriculture, and the Political Economy. In Dams, T. and K. E. Hunt (Eds) *Decision-Making and Agriculture*. Papers and Reports of the Sixteenth International Conference of Agricultural Economists, held in Nairobi Kenya 26th July-4th August.
- Seddighi, H. R., K. A. Lawler and A. V. Katos. (2000). *Econometrics: A Practical Approach*. New York: Routledge
- Waldt, G. V. D. (2001). Public Policy and Policy. In Niekerk, V., Waldt, G. V. D. and Jonker, A. (eds) *Governance, Politics and Policy in South Africa*. London: Oxford University Press.
- Wooldridge, J. M. (2006). *Introductory Econometrics A Modern Approach 3rd Edition*. Mason OH: Thomson South-Western
- World Bank. (2008). *World Development Report 2008*. Washington: The World Bank

Appendix Table 1: Results of Analysis of the First Level Estimated Regression Model

Independent variables	Coefficient*	Std. Error	t-value	p-value
Dummy for the Period (1981-1986)	2536.833	1024.720	2.476	0.018
Dummy for the Period (1987-1998)	1179.833	1255.021	0.940	0.354
Dummy for the Period (1999-2015)	8122.225	1191.914	6.814	0.000
Dummy for the Period (1999-2015)	14785.417	1620.225	9.126	0.000

R = 0.893; R² = 0.797 Adjusted R² = 0.780; F (model) = 45.870; p-value for F(model)=0.000. DW d = 0.440 *
Unstandardized