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IMPACT OF AGRICULTURAL POLICY REGIMES ON THE OUTPUT OF FOOD CROPS IN NIGERIA (1980 – 2015)

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ABSTRACT

The study evaluated the impact of agricultural policy regimes on the output of food crops in Nigeria (1980-2015). The specific objective was to; determine the growth rate of selected crop output. Time series data were used for the study. Data used in the study were obtained from Food and Agricultural Organization (FAO) crop production database for Nigeria, covering the period 1980-2015, and was analyzed using both descriptive and inferential statistics. Growth model was used to examine the trend in selected crop output. The study showed that the compound growth rates for all the crops were positive; cassava (4.92%), cocoa (2.61%), maize (5.84%), palm oil (2.84%) and rice (4.15%). This implies that there was a moderate increase in the output of the selected crops over the years. The compound growth rate in the output of maize among the crops considered was highest (5.84 % per annum) followed by cassava and was slow in cocoa with a compound growth rate of 2.61 % per annum. This result suggests that among the crops considered, maize is witnessing appreciable increase in production. The result specifically leads to the conclusion that output of cassava and rice had a direct influence on GDP growth in Nigeria from 1980 to 2015. The study therefore recommends that, the slow process of growth (deceleration) in the output of cassava, cocoa, maize and rice could be enhanced by the use of improved extension services and provision of input supports to the farmers involved in the cultivation of these crops.

INTRODUCTION

Agricultural policies provide among others for adequate financing of agriculture. The role of agricultural sector in diversification of economy cannot be over emphasized, given that it guarantees food security of any nation. Public expenditure on agriculture have however been shown not to be substantial enough to meet the objectives of government agricultural policies (International Food Policy Research Institute, 2008). The Nigerian agricultural policies have undergone metamorphosis at several stages of the country's development, starting from the colonial era to the post-colonial era of 1963. In the early part of the post-colonial era the country had a policy based on surplus extraction.

This was later transformed to an export-led policy, which brought about an improvement in the economy of the nation. The western region was exporting groundnut, while the south eastern region was known for oil palm. Agriculture contributed immensely to the Nigerian economy in various ways namely: provision of food for increasing population, supply of adequate raw materials to increase foreign exchange earnings.

The Green Revolution (GR) policy changed the policy. The green revolution changed the policy of food importation and encouraged exportation. The needs is described as a Nigeria's plan for prosperity, popularly christened a "Home grown programme" by the former president of Nigeria, Chief Arenw Olusegun Obasanjo. It was a four year medium term plan for the period of

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2003 – 2007. Needs is a federal government plan, which also expects the state and local governments to have their counterpart plan, that is state economic empowerment and development strategy (SEEDS) and the Local Government Empowerment and Development Strategy (LEEDS) and respectively. Needs significantly want to eradicate poverty and promote self-reliance, entrepreneurship innovation and rewards for hard work. Evaluating the present government policy via its achievement of NEEDs, core objective seems to portrait the government views in pursuing and realizing the ideals of development plan. The other policy, the new partnership for Africa's development (NEPAD) is an initiative of the former organization of African unity (OAU) that came into being in 2001 with South Africa, Nigeria, Egypt, Senegal and Algeria as the founding member countries. NEPAD has its primary objective to: eradicate poverty, place African countries, both individually and collectively on a path of sustainable growth and development, half the marginalization of Africa in the globalization process, accelerate the empowerment of women and fully integrate Africa into the global economy.

Furthermore on the concept of structural adjustment programme (SAP) was carried at opening up economies to increase international trade by either reducing or eliminating protection for domestic industries. In addition the policy is often implemented along with the devaluation of currency in order to make exports of the devaluing country's export cheaper in the international market. Three types of changes trade liberalization and empowerment generation in Nigeria were common, namely, reduction in rates, increase in rates and/or removal from or addition to the import prohibition list. (Ayanwu, 1992).

Major new initiatives included the elimination of export taxes, the reduction of import tariffs on agricultural inputs and the launched of agricultural credit support schemes. The structural adjustment programme (SAP) policy regimes (1986 – 1993), as a result of which government largely withdrew from directly controlling production. Other programmes were National Economic Empowerment and Development Strategy (NEEDS), 1999 – 2007, Agricultural Transformation Agenda (ATA) 2009 – 2015, the key policy thrust of this document was the supply of farm inputs directly to rural farmers to boost agricultural production.

The above policy regimes affected the positive increase and production of rice, maize, cassava, palm oil and cocoa output as Nigeria is seen to be the leading producers of some of these crops.

OBJECTIVES OF THE STUDY
The major objective of this study was to determine the impact of agricultural policy regimes on the output of food crops in Nigeria (1983-2015) and the specific objective was to; determine the growth rate of selected crop output during the policy regime periods.

STUDY AREA
Nigeria has an area of 923,769 square kilometres and is situated on the west coast of Africa with a population of over 140 million people. The country lies on latitudes 9° 04' 39.90" north of the Equator and longitudes 8° 40'

38.84" east of the Greenwich meridian. It is bounded on the west by the Republic of Benin and the Republic of Niger; on the east by the republic of Cameroon; on the north by Niger and Chad Republics and to the south by the Gulf of Guinea. The climate is equatorial and semi-equatorial. There are two seasons; the wet and dry season and agriculture is the major employer of labour and the mainstay of the economy despite her dependence on oil.

The climatic conditions in Nigeria (Temperature Relative Humidity, Sunshine, Rainfall) and the abiotic factor (soil) are favourable to the maximum production of yams, rice, maize, cassava, palm oil and cocoa. The following crops are cultivated extensively in the northern part of Nigeria (yam, rice and maize) whereas cocoa, cassava and oil palm are extensively cultivated in the southern part of Nigeria.

Method of data analysis
To investigate the influence of agricultural policy regimes on food crop output in Nigeria, we employed a combination of analytical tools including descriptive statistics and Analysis of variance (ANOVA) model involving dummies

Growth rate model
The slope gotten from the ordinary least square (OLS) regression of the linear form of the models was used in calculating the growth rate of the selected crop outputs. The model is specified below:

$Y = B_1 x 1 + B_2 x 2 + B_3 x 3 + B_4 x 4 T$ et ....model 1

Where:
Y = Output of selected crops
B_D = Slope
B_1 = Coefficient
X_1 = The different agric programmes
et = error term

The ANOVA model
The ANOVA model is given below:

$Y = β_0 + B_1 (GR) + β_2 (SAP) + (PSAP)$, crop output + Ut..................Equ (2)

GR_1 = dummy variable which takes the value 1 during period of pre OFN (1980 – 1983) and O otherwise

SAP_1 = dummy variable which takes the value 1 during period of SAP (1986 – 1993) and O otherwise

PSAP1 = dummy variable which takes the value 1 during period of post SAP (1994 – 2009) and O otherwise

Ut = stochastic error term

RESULTS AND DISCUSSION

The growth rate in output of selected crops
The result showed the growth rate of selected crops output is presented in Table 2. The result showed that the coefficients of determination (R^2) values for cassava, cocoa, maize, palm oil and rice were 0.90 (90%), 0.54 (54%), 0.62 (62%), 0.32 (32%) and 0.83 (83%) respectively, thereby indicating a positive relationship between the outputs of the crops and the trend factor (period of production). This means that time trend as a variable was very essential accounting for 90%, 54%, 62%, 32% and 83% of the variations

observed in the output of cassava, cocoa, maize, palm oil and rice respectively. It can be generally concluded that the trend of crop output over the period of study was increasing for the five crops, with maize output experiencing the highest. The findings agrees with that of Oyakhilomen (2012) who reported that time was significant in influencing output of maize.

Table 1: Output of food crops in Nigeria (1983-2013) in metric tonnes

Year	Rice MT	Maize MT	Cassava MT	Palmoil MT	Cocoa MT
1980	1090000	612000	11500000	650000	153000
1981	1241000	720000	11000000	530000	174000
1982	1250000	766000	11700000	500000	156000
1983	1280000	1027000	9950000	500000	140000
1984	1300000	1196000	11800000	500000	160800
1985	1430000	1826000	12090000	615000	160000
1986	1416000	3550000	12388000	650000	148000
1987	1780000	4612000	13876000	715000	150000
1988	2081000	5268000	15439000	700000	253000
1989	3303000	5008000	17404000	700000	256000
1990	2500000	5768000	19043008	730000	244000
1991	3226000	5810000	26004000	760000	268000
1992	3260000	5840000	29184000	1185879	292000
1993	3065000	6290000	30128000	792000	306000
1994	2427000	6902000	31005000	825000	323000
1995	2920000	6931000	31404000	837000	203000
1996	3122000	5667000	31418000	860000	323000
1997	3268000	5254000	32050805	776000	318000
1998	3275000	5127000	32695000	845000	370000
1999	3277000	5476000	32697000	896000	225000
2000	3298000	4107000	32010000	899000	338000
2001	2752000	4596000	32068000	903000	340000
2002	2928000	4890000	34120000	961000	362000
2003	3116000	5203000	36304000	1022000	385000
2004	3334000	5567000	38845000	1094000	412000
2005	3567000	5957000	41565000	1170000	441000
2006	4042000	7100000	45721000	1287000	485000
2007	3186000	6724000	43410000	1309000	360500
2008	4179000	7525000	44582000	1330000	367020
2009	3546250	7358260	36822248	12333050	363510
2010	4472520	7676850	42533180	970820	399200
2011	4612614	8878456	46190248	930000	391000
2012	5432930	8694900	50950292	940000	383000
2013	4823330	8422670	47406770	880000	367000
2014	6002831	10058968	56328480	910000	248000
2015	6256228	10562050	57643271	1185879	195000

Source: Computed from FAOSTAT data, 2016

Table 2: Analysis of Growth rate of output of selected crops

Crop	Coefficient	Standard error	R^2	t-stat
Cassava	0.048	0.0028	0.90	17.31***
Cocoa	0.0258	0.0041	0.54	6.32***
Maize	0.0568	0.0076	0.62	7.5***
Palm oil	0.028	0.0069	0.32	4.03***
Rice	0.0407	0.0031	0.83	13.07***

Source: Computed from FAOSTAT data, 2016. CGR = compound growth rate, IGR = Instantaneous growth rate.

Instantaneous and compound growth rates of cassava, cocoa, maize, palm oil and rice over the study period (1980-2015)

The computed instantaneous and compound rate of growth for the output of cassava, cocoa, maize, palm oil and rice in Nigeria is presented in Table 1. In the estimated growth rate models in Table 1, the slope coefficients of cassava, cocoa, maize, palm oil and rice was estimated and used to obtain the instantaneous and compound growth rates. The instantaneous growth rates of 4.8, 2.58, 5.68, 2.8 and 4.07 for cassava, cocoa, maize, palm oil and rice respectively implies that over the period of 1980 – 2015, the production of this crops in Nigeria increased at instantaneous (at a point in time) rate of growth. The compound growth rates (r) were

Crop output during the various policy regimes

estimated from the instantaneous rates of growth. The study revealed that 4.92 %, 2.61%, 5.84%, 2.84% and 4.15 % were the compound growth rate obtained for cassava, cocoa, maize, palm oil and rice respectively. The compound growth rates for all the crops were positive. This implies that there is a moderate increase in the output of the selected crops over the years. The compound growth rate in the output of maize among the crops considered was fastest (5.84% per annum) followed by cassava and was slow in cocoa with a compound growth rate of 2.61% per annum. This result suggests that among the crops considered, maize is witnessing appreciable increase in production. This agrees with findings of Ammani (2012) who reported similar result.

Table 3: Analysis of variance (ANOVA) result for crop output within GR period 1980 – 1983

Sources	SS	Df	MS	F-crit	P-value	F-cal
Between group	5.43E + 14	4	1.36E + 14			
					3.25E + 26	
				2.76		*835.32
Within groups	4.06E + 12	25	1.62E + 11			
Total	5.47E + 14	29	1.89E + 13			

Source: computed from FAOSTAT, 2016

The result showed that in Table 3, f-cal is 835.32 and f-crit is 2.758, therefore, there is a significant difference in the output of various crops during the GR policy regime period with cassava having the highest mean value 11,340,000kg followed by palm oil 5,491,66.7kg while cocoa had the least mean value of 157,300kg.

SUMMARY

The study evaluated the impact of agricultural policies program regime on the output of food crops in Nigeria from 1980-2015. The specific objective was to: determine the growth rate of selected crop output, compare the crop output during the various policy. Time series data was used for the study. Data used in the study were obtained from FAO crop production database for Nigeria and publications of the Central Bank of Nigeria (CBN) and National Bureau of Statistics. The data covered the period 1980 to 2015, and was analyzed using both descriptive and inferential statistics. Findings of the study suggests a strong indication that there is acceleration in output growth rate of maize (IGR 5.84%; CGR 5.68%), rice (IGR 4.15%; CGR 4.07%), cassava (IGR 4.92%; CGR 4.80%), cocoa (IGR 2.61 %; CGR 5.68 %), and palm oil (IGR 2.84 %; CGR 2.8 %), over the study period (1970-2007). Both compounded and instantaneous growth rates for all the crops were positive. The result indicates deceleration in the growth process for cassava, cocoa, maize and rice while stagnation in the growth process was observed palm oil within period of the study.

The coefficient of determinations R^2 of 0.86 indicates that about 86 percent of the total variations in Nigeria economic growth were explained by the variations in the independent variables. This shows that our model explains large proportion of variations in economic growth in Nigeria and also represents a good measure

of fit. The F-statistic shows overall significance of the model. The F-statistic (3.94) is significant at 1% level of probability. We, therefore, reject the null hypothesis that the model is not significant in explaining the variations in economic growth. The result also revealed that there is a significant difference in the outputs of cassava, cocoa, maize and rice during the policy regime period that is (GR and SAP). Cocoa (-1.599) and maize (-0.355) had significant but negative effect on economic growth at 1 % level of probability while cassava (2.781) and oil palm (0.768) exhibited a positive and significant impact on economic growth at 1 % level of probability during the long run period. The coefficient of the error correction term (-0.249) is negative and statistically significant at 1 percent level. The negative and significant coefficient is an indication of co-integrating relationship between economic growth and its explanatory variables. However, the current year cassava, previous year's cocoa, current year palm oil have a short-run negative impact on economic growth during period of study whereas, previous year's cassava, current year cocoa, previous year's palm and current year rice had a short-run positive impact on economic growth during period of study.

CONCLUSION

The study examined the impact of agricultural policies program regime on the output of food crops in Nigeria from 1980-2015. Growth model was used to examine the trend in selected crop output. The study indicates deceleration in the growth process for cassava, cocoa, maize and rice while stagnation was observed in the growth process of oil palm within period of the study. The result specifically leads to the conclusion that output of cassava and rice had a direct influence on economic

growth in Nigeria from 1980 to 2015. Policy shift did not have any significant influence on economic growth.

RECOMMENDATIONS

Based on the findings, the recommendations were that; The slow process of growth in the output of cassava, cocoa, maize and rice could be enhanced by the use of evaluation and implementation of government policies. Again government should enhance continuity of policies and programme for sustainable development.

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