ABSTRACT
The study evaluated the trends of budgetary allocation to agriculture and its impacts on agricultural output in Nigeria during military regime (1983-1998). Time series (secondary) data obtained from Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS) publications were used for analysis. The data collected were analysed using descriptive statistics (mean, maximum and minimum with graphs and trend models) and inferential statistics (Autoregressive Integrated Moving Average [ARIMA] and ordinary least square [OLS] regression model, t-test and F-test). The findings revealed that trends of budget allocations to agriculture were inconsistent during the military regime to the extent that the instantaneous growth rate of budget allocation to agriculture during the military regime was -5.25% while the compound growth rate was -5.15%. Also, the instantaneous growth rate of agricultural output during the military regime was 6.32% while the compound growth rate was 6.50%. The effect of budget allocation to agriculture on agricultural output showed a unit increase in budget allocation which led to increased agricultural output by 0.15% during the military regime with a coefficient of determination ($R^2$) of 0.67% revealing that budgetary allocation to agricultural sector has significant effect on agricultural output in Nigeria and that the relationship between them is strong, positive and significant (P≤0.0001). The agricultural output was forecasted to be about ₦17,000,000.00 in the year 2025. The study recommended that budgetary allocation to the agricultural sector should be increased and properly monitored to guarantee increased agricultural output, food security, employment and overall economic growth and development in Nigeria.

Keywords: ARIMA, Budget, military, Regime, Trend.

INTRODUCTION
Prior to the discovery of oil in Nigeria, agriculture was the mainstay of the nation. However, with the oil discovery and the oil glut of the 1970s, the sector suffered severe neglect with the sectors’ contribution to GDP declining to 35% in 2014 from 65.7% in 1957 leading to food insecurity and increased level of poverty in the country with the poverty level standing at 33.1% in 2013 (National Bureau of Statistics [NBS], 2014).

However, there has been a systematic neglect of the sector at both national and State levels since the discovery of crude oil in the country in the 1970s. Agriculture is the major source of livelihood in most rural Nigeria society (International Fund for Agricultural Development [IFAD], 2013). Hence, the neglect of the sector has opened the way for increased rural poverty, rural-urban migration, hunger and crimes (Iruo et al., 2010).

Nevertheless, part of the efforts by the federal government to sustain the country’s agricultural sector is evidenced by its various allocations to the sector in terms of lending and budgetary provisions. Budgetary provisions are often made for specific programmes or projects.
in agriculture under numerous sub-sectors mainly; crops, livestock, fisheries, and forestry (CBN, 2003).

Despite numerous laudable agricultural programmes like; Agricultural Development Projects (ADPS), River Basin Development Authorities (RBDA), Agricultural Credit Support Scheme, FADAMA Development programmes, Agricultural Credit Guarantee Scheme Fund, Operation Feed the Nation (OFN), among others, output has not improved (Oriola, 2009).

Specifically, issues of neglect of the agricultural sector characterized by instability in government allocations and insufficient capital to the agricultural sector, as well as inconsistent agricultural policies have received lots of debate since the discovery of oil and gas in Nigeria. For instance, insufficient capital and inconsistent government policies have been identified as part of the major factors affecting growth and development of the agricultural sector (Aja et al., 2010). Whereas, capital would not be a problem if adequate funding is made available for agricultural production by the government. Also, allocations to different economic sectors including the agricultural sub-sectors (crops, livestock, fisheries and forestry) are sometimes not released on time, and in some cases diverted and the programmes they were meant for therefore suffer serious neglect and delay.

Although, inadequate funding of the agricultural sector has been re-echoed by several experts as an obstacle to increased agricultural output (Central Bank of Nigeria [CBN], 2007; and Bernard, 2009), an in depth and long term analysis of the actual trend of the budgetary allocations to the agricultural sector was perhaps yet to be carried out in recent times. In addition, there was perhaps yet to be a long term convincing empirical evidences in the funding instability to the agricultural sector. This research therefore, attempts to resolve this research gap thereby revealing the trend in budgetary allocations to the agricultural sector in Nigeria between the years 1983-1998 and its corresponding impact on agricultural output.

The objectives of the study included to: examine trends of budgetary allocation to the agricultural sector and agricultural output in Nigeria during the military regime; ascertain the direction and growth rates of budgetary allocation to agriculture and agricultural output in Nigeria; analyse the effects of budgetary allocation to agriculture on agricultural output in Nigeria; and forecast agricultural output in Nigeria in the year 2025.

The annual budget remains a veritable instrument in the hands of organizations for planning, control performance, monitoring, evaluation and many other functions (Nnadozie, 2014). The role that a nation gives to the budget determines the budgeting option for any budget period. Ocheoha (2000) observed that the concept and practice of budgeting is fundamentally the same for all organizations and sectors. Jeffrey (2001) in Nnadozie (2014) asserted that many governments in West African countries fail to provide essential public goods such as investments in public infrastructures, extension services and research. Most nations in this region according to Jeffrey (2001) in Nnadozie (2014) have invested less than 5% of their annual budgets in any kind of agricultural development, even though up to 75% of their citizens still depend on farming. These small budgetary allocations to the sector leave little room for essential agricultural research, growth and development.

Federal office of statistics (FOS, 1996) stated that the Central Bank of Nigeria’s annual reports and statements of account reviewed for three and half decades revealed a declining budgetary allocation to the agricultural sector. Adefila and Jenyo (2004) observed that despite the inadequacy of funds, the limited quantum available to agricultural sector has been diminishing over the years. This is clear when agriculture is compared with some selected important sectors of the economy with regard to capital budget sectoral allocation for the years 1991–2001 and proportion of agricultural budget to the Federal budgets.
Other African countries like Ghana, Uganda and Malawi have stabilized their budget expenditures on agriculture around 10% based on the Maputo 2003 agreement. Anselm et al. (2010) reported that Nigeria has consistently spent less than 5% annual budget on agriculture. Malaysia has recorded tremendous achievements in agricultural development through sustained annual budget expenditure between 20% and 25% in the last three decades (Youngstars Foundation, 2010).

Since 1960 when Nigeria achieved independence, the performance of the nation’s agricultural sector has been inconsistent. Between the 1960s and the late 1980s, real agricultural growth per capital fluctuated between -19% and +15% per year (International Food Policy Research Institute [IFPRI], 2008).

A commitment to rise agricultural spending substantially called the Maputo Declaration where the Heads of States of the Assembly of the African Union in 2003 committed their support to the Comprehensive Africa Agriculture Development Programme (CAADP) and pledged to raise spending on agriculture to 10% of the budget within the next five years, by 2008. Also, at the second ordinary assembly of the African Union in Maputo in July 2003, African Heads of States and Governments endorsed the “Maputo Declaration on Agriculture and Food Security in Africa”.

Statistics showed that over an 18 year period of 1980–1997, Nigeria spent only 0.1% of the total budget on agricultural research (Ikpi and Ikpi, 1998). An average of 3.1% of the total budget was spent on agriculture from 1999-2001 (Federal Government budget, 1999; 2001). African Union member States, as Uganda spends 11% annually on agriculture and Ghana 9.5% and Kenya 10% (World Bank, 2006). Total spending in Agriculture by Vietnam reported by Government/World Bank (2005) is 6% low compared to the 15% allocation by China, India and Thailand.

As argued by advocates of agriculture-led growth (ALG), development of the agricultural sector is a prerequisite for industrialization through increase in rural incomes and provision of industrial raw materials, provision of a domestic market for industry and above all, the release of resources to support the industry (Timmer, 2004). The neglect of the agricultural sector in favour of the industrial sector will only lead to slow economic growth and inequality in income distribution. Therefore, despite the fact that agriculture may be unable to single-handedly transform an economy, it is a necessary and sufficient condition in kick-starting industrialization in the early stages of development (Byerlee et al., 2005).

MATERIALS AND METHODS

The study was carried out in Nigeria. Nigeria has a total geographical area of 923,768 square kilometres constituting land area of 910,768 square kilometres and water area of 13,000 square kilometres, respectively. It is one of the eight most populous countries in the world with a population of about 140 million (NPC, 2006). With a population growth rate of 2.6%, Nigeria has a projected population of about 206 million in 2020 and about 264 million in 2030. Nigeria is located between 4°16 and 13°53 north latitude and between 2°40 and 14°41 east longitude (Central Intelligence Agency [CIA] Fact Book, 2009). Nigeria has a highly diversified agro-ecological climatic condition and hence, agriculture constitutes one of the most important sectors of the Nigeria economy. The climate varies with Equatorial in South, Tropical in Centre and in the North. There are two seasons – the wet season (April-October) and the dry season (November-March). The type of vegetation is grassland savannah in the North and forest in the south. This vegetation has made agriculture the major employer of labour in the country.
Method of Data Collection

The study relied basically on secondary data. Annual time series data sourced from Central Bank of Nigeria (CBN) publications, reports, and National Bureau of Statistics (NBS) review of the economy for various years, policy papers and websites were used. Data were collected on budgetary allocation to agriculture and agricultural output in Nigeria during the military regime.

Analytical Techniques

The data collected were analysed using descriptive statistics (mean, maximum and minimum with graphs and trend models) and inferential statistics (Autoregressive Integrated Moving Average [ARIMA] and ordinary least square [OLS] regression model, t-test and F-test).

The trend model is given as:

\[ Y_t = Y_0(1+r)^t \]  \hspace{1cm} (1)

where:

- \( Y_t \) = Amount (Budget) allocated to the agricultural sector in year \( t \).
- \( Y_0 \) = Amount (Budget) allocated to the agricultural sector in the base year.
- \( r \) = compound rate of growth of \( Y \),
- \( t \) = time in chronological years.

Taking the natural log of equation 1 to make it linear, it is stated thus:

\[ \ln Y_t = \ln Y_0 + t \ln(1+r) \]  \hspace{1cm} (2)

Substituting in \( \ln Y_0 \) with \( \beta_1 \) and \( \ln(1+r) \) with \( \beta_2 \), equation (2) is rewritten as

\[ \ln Y_t = \beta_1 + \beta_2 t \]  \hspace{1cm} (3)

Adding the disturbance or error term to equation 3, we obtain

\[ \ln Y_t = \beta_1 + \beta_2 t + U_t \]  \hspace{1cm} (4)

The equation 4 is the growth rate model developed for the study. A semi-log growth model was developed for the study instead of a linear trend model because the point of interest in the study is both absolute and relative in the parameters of interest. The most important parameter in equation 4 is the coefficient of \( \beta_2 \) which is the slope and measures the constant proportion or relative change in \( Y \) for a given absolute change in the value of the regressor \( t \); multiplying \( \beta_2 \) by 100 gives the instantaneous growth rate at a point in time.

\[ IGR = (b_2)100 \]  \hspace{1cm} (5)

where:

- \( IGR \) = Instantaneous growth rate.
- \( b_2 \) = least square estimate of the coefficient of \( \beta_2 \); then taking the anti-log of \( b_2 \) and subtracting it 1 and then multiplying the difference by 100 will give the compound growth rate (CGR) over a period of time.

\[ CGR = (\text{antilog } b_2 - 1)100 \]  \hspace{1cm} (6)

If the coefficient of \( b_2 \) is positive and statistically significant or negative and statistically significant, there is acceleration or deceleration in the growth, respectively. However, stagnation in the growth exists if the coefficient of \( b_2 \) is not statistically significant.

The linear trend analysis model with the form \( Q = b_0 + b_1T + e \) and the quadratic model with the form \( Q = b_0 + b_1T + b_2T^2 + e \) was also tested to determine the best fit.

RESULTS AND DISCUSSION

Trends in Budgetary Allocation to Agriculture during the Military Regime

As shown in Figure 1, the trend of budget allocation to agriculture ranges between \( \text{₦}250.0000 \) to \( \text{₦}9040.000 \) with a mean of \( \text{₦}2869.375 \) during the military regime. This was attributed largely to the dictatorial and autocratic leadership imposed by the military regime.
and the frequent change in leadership due to coups d’état. This meant that a head of State has to strategize against adversaries as well as planning the economy which may have led to misplaced priorities in sectorial allocations; specifically, from 1983 to 1984, there was a decline in the budget allocated to agriculture. Between 1984 and 1985, there was an increase (₦1,020) in budget allocated to agriculture; from 1985 to 1986, the budget allocated to agriculture was fairly constant (₦930); from 1986 to 1987, there was a slight decrease (₦390) in the budget allocated to agriculture; and from 1987 to 1990, the budget allocated to agriculture continued to rise (₦1,960) and experienced a decrease (₦670) from 1990 to 1991; from 1991 to 1992, the budget allocated to agriculture increased (₦920) and also, a further increase (₦6,920) until 1995 where the allocation nosedived till 1996 (₦5,710); and furthermore, from 1996 to 1998, there was an increase (₦9,040) in the budget allocated to agriculture. This agrees with the findings of Margaret et al. (2013) who observed funding instability and fluctuations in funding to the agricultural sector via the annual budget allocation to the sector. It also agrees with the findings of Akpokodjie and Nwosu (1993) who stressed that government allocation to agriculture is relatively low and that actual expenditure falls short of budgeting expenditure and the rate of under spending is usually higher for agriculture than for other economic sectors.

Figure 1: *Trends in budgetary allocation to agriculture during the military regime (1983-1998).*

Note: BASS = Budget Allocation to Agricultural Sector.
Source: Data analysis, 2019.

**Trends in Agricultural Output during the Military Regime**

Figure 2 shows the trend in agricultural output during the military regime. The trend of agricultural output during the military regime ranges between ₦230,351 to ₦447,5240 with a mean of ₦343,9264. This is attributed to the fact that the agricultural sector employed the majority of the active population and therefore generates additional value for the agricultural sector. Specifically, from 1983 to 1984 there was a decline (₦230,351) in the agricultural output; from 1984 to 1986, there was an increase (₦2,986,840) in agricultural output; from 1986 to 1987, there was a slight decrease (₦2,891,670) of agricultural output and from 1987 to 1998, there was a sharp increase (₦2,891,670) of the agricultural output. This agrees with the
findings of the IFPRI (2008) and Bello et al. (2012) who found out that though the performance of the nation’s agricultural sector has been inconsistent, its contribution to gross domestic product (GDP) in Nigeria is very significant.

![Graph of Agricultural Output](image)

Figure 2: Trends in agricultural output during the military regime (1983-1998).

Note: AOUT = Agricultural Output.

Source: Data analysis, 2019.

**Budget Allocation Growth Rates and Direction to Agriculture during the Military Regime**

The result of the trend analysis of budget allocation during the military regime is shown in Table 1. The trend equation revealed that the growth rate of budget allocation to agriculture was negative which implies a negative growth rate. The coefficient for estimating the growth was negative (-0.053) and not significant. Therefore, the instantaneous growth rate (growth at a point) of budget allocation to agriculture during the military regime was -5.3% while the compound growth rate was -5.15%. The direction of growth during the military regime shows that there was acceleration in budget allocation to agriculture. The $R^2$ value of 0.80 shows that, 80% of the variations in the trend of budget allocation to agriculture during the military regime are explained by time. This is consistent with the findings of Olowa and Olowa (2014) who observed that budget allocations to agriculture have remained unnecessarily constant over the years.

**Table 1: Trend Analysis for Budget Allocation to Agriculture**

<table>
<thead>
<tr>
<th>Variables at:</th>
<th>Coefficient</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>6.50</td>
<td>18.30</td>
</tr>
<tr>
<td>Trend</td>
<td>-0.53</td>
<td>-0.48</td>
</tr>
<tr>
<td>Trend$^2$</td>
<td>0.017</td>
<td>2.37</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>F-statistics</td>
<td>26.32</td>
<td></td>
</tr>
</tbody>
</table>

Source: Data analysis, 2019
Growth Rates and Direction of Agricultural Output during the Military Regime

The result of the trend analysis of agricultural output during the military regime is shown in Table 2. The coefficient for estimating the growth of agricultural output was positive (0.063) and significant; therefore, the instantaneous growth rate (growth at a point) of agricultural output during the military regime was 6.3% while the compound growth rate was 6.50%. The direction of growth during the military regime shows that there was deceleration in agricultural output. The R² value of 0.97 shows that, 97% of the variations in the trend of agricultural output during the military regime are explained by time. This observation is consistent with earlier findings by Anyanwu et al. (2013) which showed the dominance of agriculture share of GDP from 1960-1999, though at a declining rate.

Table 2: Trend analysis for Agricultural Output

<table>
<thead>
<tr>
<th>Variables at:</th>
<th>Coefficient</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>14.68</td>
<td>624.29</td>
</tr>
<tr>
<td>Trend</td>
<td>0.063</td>
<td>8.69</td>
</tr>
<tr>
<td>Trend²</td>
<td>-0.002</td>
<td>-3.20</td>
</tr>
<tr>
<td>R²</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td>F-statistics</td>
<td>231.02</td>
<td></td>
</tr>
</tbody>
</table>

Source: Data analysis, 2019

Effects of Budgetary Allocations to Agriculture on Agricultural Output

The OLS result showed that budgetary allocation to agricultural sector (b₁BASS) conforms to the a priori expectation as regards its sign during the military regime. The parameter b₁ has a positive sign (0.15) showing budgetary allocation to agricultural sector has a positive relationship with agricultural output. This is in conformity with the a priori expectation. This positive relationship shows that as budgetary allocation to agricultural sector is increasing, agricultural output increases and vice versa during the military regime. This assertion confirmed the results of Umaru and Zubairu (2012) and Kola (2011) who variously affirmed the dominance of agriculture’s contribution to GDP of Nigeria.

The result of the effects of budget allocation to agriculture on agricultural output is presented in Table 3. The result showed that the coefficient of determination (R²) is 0.67 implying that 67% of the total variation in agricultural output was explained by budgetary allocation to agricultural sector during the military regime. The result also showed that the F-statistics (27.81) was positive and significant at 1% indicating the overall significance of the model. The result further stated that the coefficient of budget allocation (0.15) was significant and positive indicating that a unit increase in budget allocation to agriculture will lead to increase of agricultural output by 0.15. This is attributed to the fact budget allocation includes both capital and recurrent expenditures which may lead to increase in agricultural output over time.

Table 3: Effect of Budget Allocation to Agriculture on Agricultural Output

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>13.96</td>
<td>67.76</td>
</tr>
<tr>
<td>Budget allocation</td>
<td>0.15</td>
<td>5.27</td>
</tr>
<tr>
<td>R²</td>
<td>0.67</td>
<td></td>
</tr>
<tr>
<td>F-statistics</td>
<td>27.81</td>
<td></td>
</tr>
</tbody>
</table>

Source: Data analysis, 2019
Forecast of Agricultural Output in Nigeria in 2025

The forecast of agricultural output in the Nigeria in the next decade (2025) is shown in Figure 3. The result showed that agricultural output in 1985-1995 was ₦4,000,000, agricultural output from 1995-2005 was ₦7,500,000, while from 2005-2015 agricultural output was ₦12,000,000. The result further showed that agricultural output in Nigeria will be about ₦17,000,000 in the next decade (2025). This is explained by the various agricultural policies set up by the federal government. This is consistent with the findings of the World Bank (2018) who projected agricultural output in the Nigeria to be about 263 billion by 2030 with a growth rate of 4.7%.

Figure 3: Forecast of agricultural output in the next decade
Source: Data analysis, 2019.

CONCLUSION AND RECOMMENDATIONS

Budgetary allocation trends to the agricultural sector and agricultural output during the military regime was empirically analysed. The study found out that the trend in budget allocation to the agricultural sector and agricultural output has been inconsistent over the years during the military regime. Also, growth rate and direction of budget allocation to the agricultural sector was accelerating during military regime. The growth rate and direction of agricultural output was decelerating during the military regime. The study therefore recommended that:

1. Agriculture should be placed on government top priority list such that its position within the sectoral allocation could be substantially enhanced.
2. Conscious efforts financially should be made by government at all levels towards increasing budgetary allocation to the agricultural sector.
3. In addition, government should put in place a monitoring mechanism in terms of supervision to ensure that the allocation to the Agricultural sector are applied to what it is intended for to guaranty good security.

REFERENCES


