

**Pathway Correlates of the Value of Agricultural Exports in the Oil Boom Era in Nigeria (1970-2006): Implications for Nigeria Development Plan for 2020**

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**ABSTRACT**

*This study examined the pathway correlates and the trend of value of agricultural exports in Nigeria in the oil boom era (1970-2006) and its implications for Nigeria Development Plan for 2020. Time series data were collected from CBN annual reports. Time response graph was used to analyze the trend of agricultural export indices. Correlation matrix and Ordinary Least Square technique of multiple regression were used to analyze the relationship between the value of agricultural exports and the selected macroeconomic variables. The findings of the study show that almost all the agricultural export parameters attained a peak in the early 1970s and later took a downward trend during the oil boom era in Nigeria. The value of agricultural exports correlates strongly with exchange rate (0.6%), index of agricultural production (0.5%) and agricultural share in non-oil exports (0.66%). It is recommended that reversing the downward trend of agricultural export parameters would require upgrading of agricultural production and the intensification of agricultural export promotion by the States and Federal Ministries of Agriculture as well as Ministry of Commerce and Industry in Nigeria. There should be special subsidy for all agricultural export crops.*

**KEYWORDS:** Agriculture, Exports, Correlates, Oil Boom Era, Nigeria Development Plan.

**INTRODUCTION**

Nigeria has planned to be one of the best economies in the world by the year 2020. This projection was based on oil revenue. Available information now shows that oil revenue has dwindled drastically and the hope of realizing that plan can only be achieved through the revenue from other sectors such as agriculture. The agricultural sector is one of the pillars of Nigeria economy. It is the vital source of raw material needed for the agro allied industries, especially in the Beverages Company, food and export. It was the corner stone of the economy in the 1960's and late 1970's before oil was discovered. Nigeria was heavily dependent on agriculture, as it accounted for more than 40% of the Gross Domestic Product (GDP). It was the major source of

fund for the first development plan 1962-1968. Within a decade however, agricultural output in Nigeria declined by 1.9% and export fell by 7.9%. The sector has suffered from years of mismanagement and inconsistency in the government policies. The era of huge oil revenue also contributed to the neglect of the agricultural sector, but the sector still accounted for over 26.8% of the Gross Domestic Product (GDP) and two-third of employment (Akorlie,1994). However, in effective government policy and import demand in Nigeria possibly led to the continuous decline in the agricultural sector. Efforts were made in the past to boost agricultural export sub-sector. This include the establishment of river basin and rural Development Authorities the Agricultural Development Programmes (ADP) founded jointly by the World Bank and the federating units in Nigeria and more than 20 Agricultural Research Institutes. The Obasanjo's Operation Feed the Nation (OFN), Shagari's Green Revolution, Obasanjo's Cassava Initiatives in 2004-2005 and more recently, the Agricultural Transformation Agenda.

In spite of the above mentioned efforts since independence, the role of agricultural sector in the economic development equation, seems to assume a downward trend, especially, its contribution to Gross Domestic Product (GDP) and foreign exchange earnings derivable from value of agricultural exports in Nigeria. This is attributable to oil discovery and its associated revenue (Oji-Okoro, 2011). Agriculture is the main stay of many economies and it is fundamental to the social-economic development of a nation. Oji-Okoro (2011), describes agricultural sector as the most important sector of the Nigeria economy which holds a lot of potential for the future economic development of the nation through employment generation to more people than the oil sector. It was observed that in spite of Nigeria's rich agricultural resources endowment there has been a sharp decline in the value of agricultural exports as a measure of its contributions to the Nigerian economy.

It is thus important to investigate the correlate variables (such as exchange rate, volume of agricultural exports, agricultural productivity, e.t.c) of the value of agricultural exports in terms of how they behaved in the oil boom era. The essence is to situate how strongly each variable correlate with the value of agricultural exports in the path or course of time throughout the oil boom period.

The pertinent research questions raised in this study were:

- i. Can the agricultural sector sustain the Nigerian economy based on the value of her agricultural exports alone despite oil sector failure?
- ii) What relevant variables can significantly boost (or otherwise) the value of Nigeria's agricultural exports?

Providing answers to these questions requires information on agricultural exports in the oil boom era in Nigeria (1960-2006).

The cardinal thrusts of this study were to:

- i. investigate the value trend of the agricultural exports in the oil boom era;
- ii. determine the path correlates of agricultural exports in the oil boom era in Nigeria.

The hypotheses formulated and tested in the study were:

*H<sub>0</sub>: There is significant correlation between the value of agricultural exports and the selected variables.*

*H<sub>a</sub>: No significant correlation existed between the value of agricultural exports and selected variables.*

## **CONCEPTUAL FRAMEWORK**

### **Theoretical Underpinnings of Agricultural Exports**

This study was predicated on the theory of economic geography. The theory of economic geography emphasizes location distribution and spatial organization of economic activities across regions and countries of the world (Attila, 2014). The theory stipulates that natural resources endowment are location-specific. As a result, the dominant economic activities, livelihood and welfare of the people depend on resource-endowment in the area. The Nigeria geographical environment favors agricultural export crops' (rubber, cocoa, oil palm, Beni seed, beans, cotton) production, processing and distribution activity chains. There must be surplus of the agricultural resources in one country (surplus region) and a region of scarcity as well as the bilateral trade agreement between the two regions for export to take place. The basis for exports between nations can therefore be hinged on the twin theory of economic geography and comparative advantage.

## **RESEARCH METHODOLOGY**

The study was conducted in Nigeria and it was based on secondary data (1970-2006), collected from Central Bank of Nigeria annual report and statement of account and statistical bulletin (2005, 2011, 1993.). The data covered the outputs of agricultural commodities, volume of agricultural exports, agricultural productivity and population growth rate. Time-response graph was used to analyze the trend of agricultural export indices. Correlation matrix, Error Correction Model (ECM), Granger causality Test and Multiple Regression techniques were applied for the analysis of relationship between the value of agricultural exports and the selected macroeconomic variables. The multiple regression model used is as specified below:

$$VAE = B_0 + B_1VOEXP + B_2EXR - B_3INAP + B_4AGSH + B_5SHANOE + B_6SHAGDP + B_7POPGT_t + E_i \dots Equ.1$$

Where:

VAE = Value of Agricultural Export (\$)

VOEXP = Volume of Agricultural Exports (MT)

EXR = Exchange rate (%)

INAP = Index of Agricultural productivity

AGSH = Agriculture share in Total Export (%)

SHANOE = Share of Agriculture in Non-oil Export (%)

SHAGDP = Share of Agriculture in GDP (%)

POPGT = Population Growth rate (%)

E<sub>i</sub> = Stochastic error term

B<sub>0</sub> = Constant or intercept

B<sub>1</sub>-B<sub>6</sub> = Coefficients of parameter estimate

## **RESULTS AND DISCUSSION**

### **Performance of Agriculture and Oil Sectors (1960-2006)**

After independence in 1960, agriculture was the dominant sector of Nigeria economy. Agriculture provided high level of employment for the economy and the needs of the household. Table 1. describes the performance of agriculture and the oil sector from 1960 to 2006. Agriculture contributed about 67.0 % to the GDP while the oil sector contributed only about 0.6% to the GDP of Nigeria economy. Ten years later, i.e in 1970, the performance of the agricultural sector dropped to 45.5% while oil sector contribution increased to about 23.4%. In

1980 the agricultural sector contributed only about 15.5% to the GDP and the oil sector boast its contribution to about 28.0%. Ten years later (i.e in 1990), the contribution of agriculture to GDP increased to about 30% while the contribution of the oil sector fell to about 12.8%.This implies that agricultural sector had great prospects in the economy of Nigeria.

**Table 1 Contributions of Agriculture and Oil Sectors to Nigerian GDP over time**

Year	Contribution of agriculture to GDP	Contribution of Petroleum to GDP
1960	67.0%	0.6%
1970	45.5%	23.4%
1980	15.5%	28.0%
1990	30%	12.8%
2000	24.6%	51%
2006	50.78%	66.215

*(Source: Publication of CBN, 2008).*

In the year 2000 agriculture contributed 24.6% to the GDP while the oil sector took over by contributing 51%to GDP. In the year 2006 agricultural sector boost its contribution to about 50.78% while the performance of the oil sector further increased to 66.21%. This result implies that agriculture has great potentials in boosting the Nigerian economy.

### **Trend of Agricultural Exports in the Oil Boom Era**

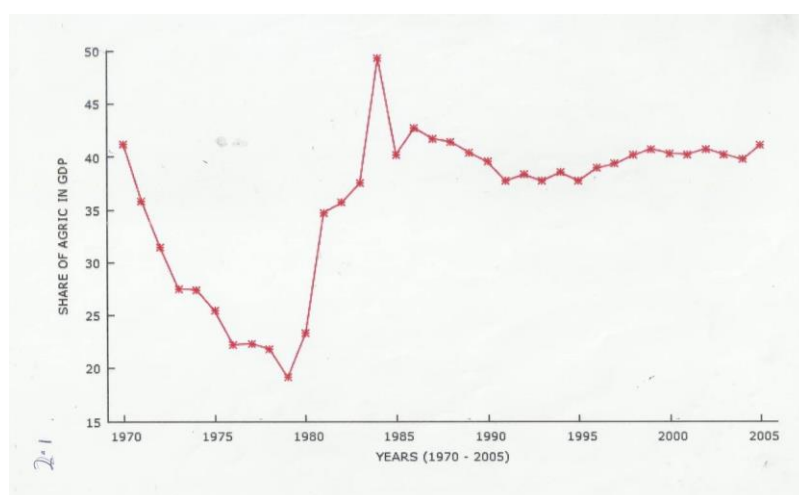
It is observed to be the largest contributor to the non-oil foreign exchange earnings. The agricultural sector is essential to the economic development by stimulating and supporting the growth of agro- allied industries. Exports expansion has gone hand in hand with increase in agricultural activities.

Nevertheless, agricultural exports are the major earners of foreign exchange in Nigeria, in the non-oil sector. In most developing countries including Nigeria agriculture remains the backbone of the economy. It is the largest source of employment, often two third or more of the population depends their livelihood on agriculture. In the 1950's and 1960's agriculture accounted for 60-70% of total export of cocoa, cotton, palm oil, Palm kernel, groundnut and rubber. Average

annual growth rates of 3-4% were achieved for agricultural and food crops. Government revenue is depended heavily on agricultural export, although the sector declined by 17 percent in 1996, agricultural export shrank from the traditional 12-15 commodities of the 1960's. The decline in Agricultural exports was the oil price shocks of 1973-1974 and 1979 which resulted in large inflows of foreign exchange earnings to the neglect of the agricultural sector.

### **Share of Agriculture in Gross Domestic Product (GDP)**

From the 1960's – 1970's it was observed that agriculture contributed immensely to the GDP of Nigerian economy.



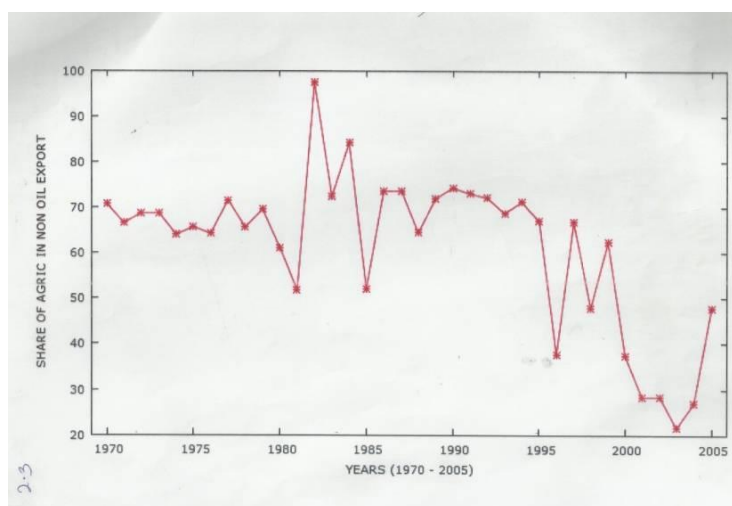
**Fig1: Share of agriculture in GDP**

Before the oil boom period, agriculture was the major source of foreign earnings. Agriculture also contributed to employment, food production, even after the discovery of oil. In Nigeria, agriculture was still playing an important role though there was a decline. In 2001, agriculture was about 40% of GDP. The sector recorded moderate growth of 50% to 51% in 2004 and 2005 respectively, as explained in Figure1.

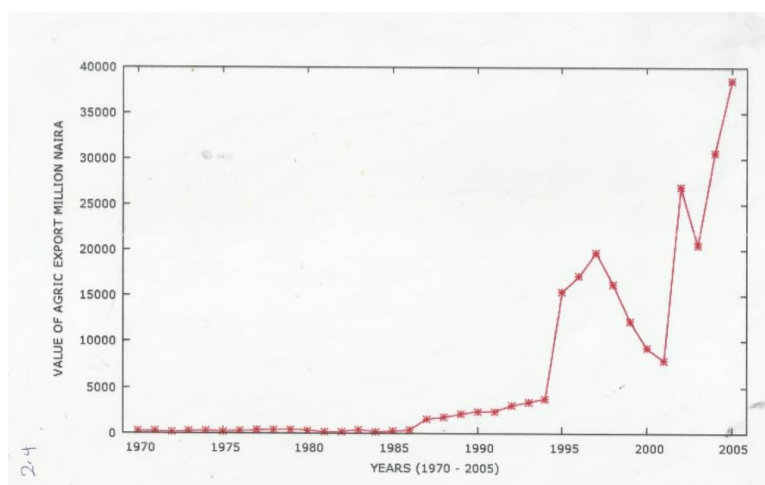
### **Share of Agriculture in Non-Oil Export**

Agricultural commodities have been the major non- oil export commodity. Although in 1983-1984 agricultural exports were at its peak, possibly due to government support of the sector. Over the years, some of the agricultural commodities were rejected, commodities rejected are food items like beans, melon seed, fried fish, meat, peanut chips and palm oil, cocoa and cashew

nuts. The reasons for rejection was the inability of exporters to follow the global standard, poor packaging and high level of chemicals, poor labeling and lack of proper nutritional information. According to the European Food Safety Authority, beans are expected to have minimum residue of about 0.01mg but beans from Nigeria contains 0.03mg to 4.6mg of pesticide. As a result of this, the share of agriculture in non-oil export has affected the economy as shown in figure 2. This finding corroborates the earlier report of Daramola *et al.* (2007) who observed that Agricultural exports are negligible and represent about 0.2 per cent of total exports.



**Fig.2 Share of Agriculture in Non-Oil Export**



**Fig.3 Value Agricultural exports**

### Value of Agricultural Exports (Million Naira)

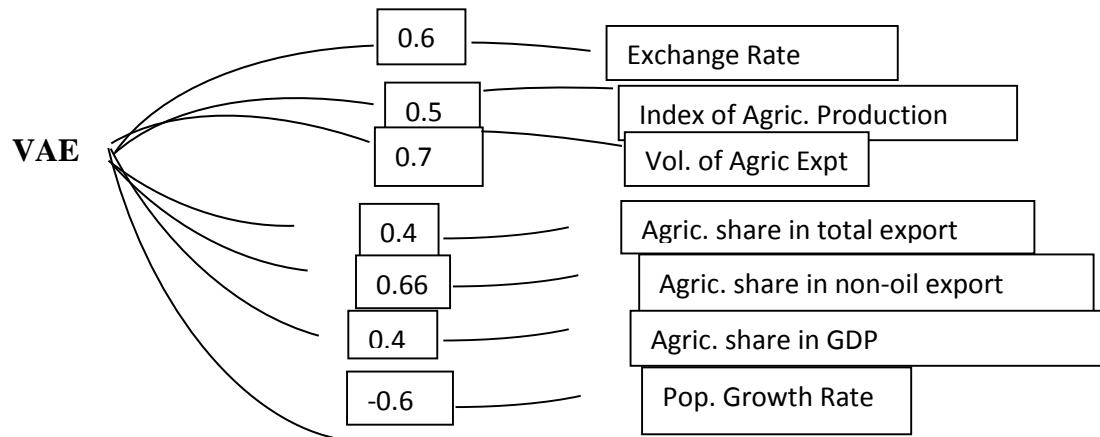
Nigeria experience a decline from non -oil exports from the year 1970 to around 1995 (\$767.54million). The decline resulted in the fall of exports receipt to 89.7% in the manufacturing sector. The performance of non-oil revenue in the period under consideration showed a downward trend of \$658.52million to \$61.99million, and \$36.75million. Figure 3 shows that the proceeds of agriculture, food product and mineral sector were 85.8%, 8.1%, 0.7% and 0.6% respectively. Central Bank of Nigeria (CBN) (2008), stated that the amount of non -oil exports for January 2005 showed an increase of about 99.5% increase it means that agricultural export has the potential of boosting the country's economy.

**Table 2: Correlates of Value of Agricultural Exports in Nigeria**

	Volume of Agric. Export	Value of Agric Export in million naira	Exchange rate	Index of Agric Production	Agric Share in Total Export	Share of Agric in Non-Oil Export	Share of Agric in GDP	Pop. growth rate
Volume of Agric Export	1	0.7 (0.07)	0.521 (0.034)	-0.65 (0.03)	0.667 (0.02)	-0.018 (0.91)	-0.16 (0.3)	-0.621 (0.03)
Value of Agric Export in million Naira		1	0.642	0.541 (0.01)	-0.367 (0.02)	-0.664 (0.01)	0.363 (0.03)	-0.621 (0.025)
Index of Agric Production				1	-0.401 (0.15)	-0.340 (0.43)	0.393 (0.8)	0.302 (0.47)
Share of Agric in Total Export					1	0.291 0.85	-0.13 (0.5)	0.403 (0.30)
Share Agric in Non-Oil Export						1	-0.16 (0.3)	0.411 (0.211)
Share of Agric in GDP							1.000	-0.51 ((0.01)

*Note: The values in parenthesis below the coefficients in the table are the corresponding P-value*





Where VAE is Value of Agricultural Exports

**Fig. 4 Pathway Correlates of Value of Agricultural Exports**

Pathway correlation analysis, as in Fig.4, permits directional interactions and dependency among variables. The multiple regression results for pathway correlation analysis are as given in equation 2.

$$\begin{aligned}
 \text{VAE} = & 0.45 + 0.7\text{VOEXP} + 0.6\text{EXR} - 0.54\text{INAP} - 0.36\text{AGSH} - 0.66\text{SHANOE} + 0.36\text{SHAGDP} - \\
 & (0.611) \quad (0.01)^* \quad (0.034)^{**} \quad (0.70) \quad (0.02)^{**} \quad (0.01)^* \quad (0.30) \\
 & - 0.62\text{POPGT} + \text{Ei} \\
 & (0.03)^{**}
 \end{aligned}
 \quad \dots \text{Equ. 2}$$

\* = significant at 5%; \*\* = significant at 1%;  $R^2$  = Coefficient of determination (71%)

The  $R^2$  value of 71% shows that 71% of the depended variable (value of agricultural exports), is explained by the explanatory variables in the model. This is a measure of the joint significance of the model. At this juncture, the relationship between the individual explanatory variables and the dependent variables (value of agricultural exports), is presented.

### Exchange Rate

The Figure 4 and Table 2 show the correlation pathway of value agricultural exports in Nigeria. The result shows that the exchange rate correlates with the value of agricultural export by 0.6%. This implies that there is a positive relationship between the value of agricultural exports and the exchange rate, the higher the exchange rate. The higher the value of agricultural exports i.e, when exchange rate increases, the revenue that will be generated from exports also increases.

### **Index of Agricultural Production**

The value of agricultural exports correlated positively with the index of agricultural production by 0.5%. This implies that the higher the production of agricultural commodities, the higher the value of agricultural exports in Nigeria.

### **Volume of Agricultural Exports**

The volume of agricultural exports correlates positively with the value of agricultural exports in Nigeria at 0.7%. This implies that, in the oil boom era, population of domestic consumers increased, thereby imposing pressure on aggregate domestic demand land other than agriculture resources. The implication of this, is that, aggregate agricultural output will fall as well as agricultural exports. A decrease in volume of agricultural exports will create a reversed effect on the value of agricultural exports. This implies that, as the volume of agricultural exports increases, it will also lead to an increase in the net value of exports.

### **Agricultural Share in Total Exports**

The value of agricultural exports has a positive relationship with the agricultural share in total exports earnings at 0.4%. This implies that the higher the value of agricultural exports the higher the share of agriculture in GDP of the Country.

### **Agricultural Share in Non- Oil Exports**

The result of the study also shows that agriculture made dominant contribution in the non-oil exports GDP of Nigerian economy among the non-oil revenue to the country because the analysis shows a strong positive correlation between the value of agricultural exports and the agricultural share in non-oil exports (i.e.0.66). This explains that agricultural exports have the highest share in the non -oil exports of the economy, it implies that agriculture has the potentials of sustaining the Nigeria economy in the absence of oil revenue.

### **Share of Agricultural Exports in Gross Domestic Products**

The findings of the study show that the value of agricultural exports correlated with the agricultural share in Gross Domestic Product at 0.4. This positive relationship implies that value of agricultural exports has great potentials in boosting Nigeria's GDP. As a result, any variable

that significantly correlates with value of agricultural exports is capable of influencing GDP of a nation.

### **Population Growth Rate**

Population growth rate entered the model with a negative sign in line with a priori expectation. There is a significant negative relationship between the value of agricultural exports and population growth rate (-0.6). Furthermore, increased population has the tendency of increasing domestic consumption of agricultural output, thereby reducing the quantity meant for exports and the resultant value or revenue generated from exports. Exporting nation must satisfy domestic demand for agricultural products before exporting the surplus. Importing nations must have shortage or scarcity of the product before engaging in its importation. Therefore, with increasing population of domestic consumers of Nigeria agricultural exports products, and with constant output, quantity left for export (i.e. volume of exports) will dwindle and the associated value of exports will fall at the ruling exchange rate. Export volume and export value expansion can only benefit from international market through domestic production capacity upgrading and the discovery of more foreign markets/consumers of Nigerian agricultural export products.

### **CONCLUSION**

The main thrust of this study was to examine the pathway correlates and the trend of value of agricultural exports in Nigeria in the oil boom era (1970-2006) and its implications for Nigeria Development Plan for 2020. This investigation thus shed some light on the trends and path correlates of value of agricultural exports in the oil boom era (1970-2006). There is strong evidence of downward trend in the performance of agricultural export parameters. However, the value of agricultural exports assumed an upward expansion path in Nigeria during the oil boom era. The test of hypothesis and factor analysis revealed that most significant correlates of expansion pathway of value of agricultural exports are volume of agricultural exports (0.7) and share of agriculture in GDP. Between 2000 and 2005, the value of agricultural exports in total exports was 53% of GDP. We conclude that increased output of agricultural export crops through efficient production technologies for cocoa, rubber, palm oil, cotton is expected to increase the rate of transmission of foreign exchange revenue for the realization of Nigeria development agenda for the year 2020.

## **IMPLICATIONS FOR NIGERIAN DEVELOPMENT PLAN FOR YEAR 2020**

The implications of the low net value of agricultural exports in the oil boom era are that significant correlate variables, particularly, volume of agricultural exports, unfriendly exchange rate and index of agricultural productivity did not receive enhancement policies. Also, aggregate agricultural output is so low that it could not satisfy ever increasing domestic population and foreign demand satisfactorily. Value of agricultural exports over the period performed poorly to the extent that its role in the realization of Nigeria Development Plan for 2020 is still a mirage unless something is done urgently.

## **RECOMMENDATIONS**

It is hereby recommended that reversing the downward trend of agricultural export parameters for the realization of Nigerian Development Plan 2020, would require the upgrading of agricultural production by Nigerian Government, and the intensification of agricultural export promotion by the States and Federal Ministries of Agriculture as well as Ministry Commerce and Industry in Nigeria. In addition, there should be special subsidy for all agricultural export crops, and in so doing take cognizance of the key factors that boost agricultural exports, since the value of agricultural exports has a strong positive correlation with the agricultural share in non-oil exports.

The implementation of the above recommendations will translate to a robust foreign exchange earnings necessary for the realization of Nigeria Development Plan for year 2020.

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