THE AGRICULTURAL SECTOR AND ECONOMIC DEVELOPMENT: THE NIGERIAN EXPERIENCE

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ABSTRACT

Agriculture constitutes the predominant activity in most of the six geo-political zones in Nigeria, the percentage of persons engaged in the agricultural sector ranges between 24.4 and 85.1 per cent across zones in Nigeria. With respect to states, the activity ranges between 2.4 and 91.7 per cent, majority of states having over 50 percent. Food is one of the basic necessities of life hence the need to encourage agriculture. It is in this vein that, this study examines the role of the Agricultural sector in Economic Development. The empirical data used in this study was from 1970 to 2008, the Johansen Co-integration technique of regression was used to analyze the data. The results show that, there is no significant impact of the agricultural sector on economic development in Nigeria. The study recommends that research and technology would drive agricultural development and increase agricultural productivity and that the Government should establish agricultural fund to finance and facilitate medium/large scale agricultural production, to enhance employment, production for local consumption and for export. Therefore, the study concludes that any policy thrust that addresses poverty would inevitably focus on agriculture, by increasing rural opportunities that could generate agricultural induced development. Hence, the development of agriculture is a sine qua non for the alleviation of poverty and achievement of sustainable development.

Keywords: Agricultural Sector, Economic Development, Research and Technology.

1.0   INTRODUCTION

Agriculture is the predominant activity in most of the zones in Nigeria, percentage of persons working in agriculture ranges between 24.4 and 85.1 percent across zones in Nigeria. With respect to states, the activity ranges between 2.4 and 91.7 per cent, majority of states having over 50 percent. Increases in agricultural output brought about by increasing land and labour productivity, will make food cheaper; benefit both rural and urban poor people who spend much of their income on food. Under right condition, increase in agriculture productivity causes the incomes of both small and large farmers to increase and generate employment opportunities. These increases in income is particularly important because the proportion of people mainly dependent on agriculture for their income remains high; ranging from 45% in East and South Asia, to 53.2% in Asia and 63.5% in Sub-Saharan Africa (Ogen, 2007). The agricultural sector has a traditional role to play in the path of economic development. But in an economy like Nigeria, the agricultural sector had suffered set back in recent times, which has attributed to widespread poverty and insecurity experienced today. Though, no so-called developed nation today actualized this status solely by agricultural transformation, but in many, conscious efforts on agriculture at the early stage of development played a critical role in economic development.

Moreover, rapid increase in agricultural output by increasing land and labour productivity will make food cheaper benefiting both the urban and rural poor people who spend much of their income on food. Increasing productivity will bring about increased incomes of both farmers and even non-farmers, because the proportion of people mainly dependent directly or indirectly on agriculture and agricultural products for their income remains extremely high. The hypothesis of this study (stated in its null form) is:

H_0: Agricultural Sector has no significant impact on Economic Development of Nigeria.

It is with this quest for recent empirical-econometric facts that motivated this study, poised with the aim of finding out how agricultural output can help to reduce, if not eliminate poverty and enhance growth and thus development. It is equally aimed at providing policy information for the government. Time series data from 1970-2008 for the variables from the relevant data sources would be gotten and the Johansen Technique will be used to get the regression results.

The remaining part of the study is structured as follows: next is literature review, followed by the theoretical framework. Methodology and analysis of data are in Section IV. Conclusion is in the last section.

2.0 LITERATURE REVIEW

The Nigerian economy, like that of Brazil during the first decade after independence, could reasonably be described as an agricultural economy because agriculture served as the engine of growth of the overall economy (Ogen, 2007). From the standpoint of occupational distribution and contribution to the GDP, agriculture was the leading sector. During this period Nigeria was the world's second largest producer of cocoa, largest exporter of palm kernel and largest producer and exporter of palm oil. Nigeria was also a leading exporter of other major commodities such as cotton, groundnut, rubber and hides and skins (Alkali, 1997). The agricultural sector contributed over 60% of the GDP in the 1960s and despite the reliance of Nigerian peasant farmers on traditional tools and indigenous farming methods, these farmers produced 70% of Nigeria's exports and 95% of its food needs (Lawal, 1997). However, the agricultural sector suffered neglect during the hey-days of the oil boom in the 1970s. Since then Nigeria has been witnessing extreme poverty and the insufficiency of basic food items.

2.1 THE ROLE OF AGRICULTURE IN ECONOMIC DEVELOPMENT

At independence in 1960 agriculture accounted for well over half of our Gross Domestic Product (GDP), and was the main source of export earnings and public revenue, with the agricultural marketing boards playing a leading role, but today this leading role in the economy has been taken over by the national oil company, the Nigerian National Petroleum Company (NNPC). According to the Central Bank of Nigeria's data (2003), Oil still accounts for our major revenue (gearing towards 80%) and almost 100% of our export earnings. Although Agriculture (particularly forestry, livestock and fishing) is shown to serve as the major activity of the majority of Nigerians; it is clear that we indulge in agriculture purely as personal survival strategies rather than as a calculated effort to warming the engine of our countries economy. This is really where our National economic problem lies.

The gospel of economic salvation cannot be preached without due regard to agricultural development. Agriculture is the major and most certain path to economic growth and

sustainability. It encompasses all aspect of human activities - being the art, act, a cultural necessity and science of production of goods through cultivation of land and management of plants and animals which creates an activity web-chain that satisfies social and economic needs. Agriculture is the mainstay of mankind; therefore wise nations all over the globe give it a priority by developing and exploiting this sector for the upkeep of their teeming populations through the earning of revenue for development purposes; as well as employment for the stemming down crimes, corruption and other forms of indiscipline which work against all factors of life, living and most of all economic production. While many nations in the world are working hard and reaping their harvests in this direction, Nigeria happens to belong among the few that have greatly retarded from their past glorious heights in agriculture, down to a near zero scale of agricultural production. Surely, this neglect is because of irresponsible and ill-purposeful leadership (Chigbu, 2005).

Nigeria is blessed with a wide variety of agricultural potentials, ranging from varieties of crops to varieties of animals and plants and natural agricultural-supportive factors like forests, waters, sands and most of all human resources that are being under-used (or not even used as at now). We have it all, yet we lack it all; and that is why we are hungry in the face of plenty to eat. How can our Nation grow well if we cannot cultivate and manufacture our own food? Nigeria's economic development can only be realistic through the total resuscitation of our agricultural sector. This will propel the sector to produce food and fibres to feed our people and the industry at a rate faster than the birth-rate; yet reducing the death rate. The injection of vigour into the agricultural sector will also fasten the creation of self-reliance, self-contentment and self-sufficiency (which will be translated to National sufficiency). Adequate supply of raw materials for industries, increased foreign reserve; and increase in the export of non-oil commodities and improvement in the standard of living of the masses are issues that a revitalized agricultural system can provide. This will encourage the growth of a physically fit and mentally alert population. Succinctly put, the development of the agricultural sector will generally improve the revenue generation of our nation and discourage our over-reliance on oil and gas, which has created a 'Dutch disease' for the Nigerian economy. The economic independence, which the agricultural sector can offer, this nation (if developed) will undoubtedly propel us to political and economic independence, which we cannot truly boast of today as a debtor and borrower nation. Rural and urban development, rural and urban employment; and of course the control of urban

migration and general development of other sectors of the economy will be the positive chain reactions of an improved Agricultural sector.

3.0 THEORETICAL FRAMEWORK

This study has its theoretical backing from the Jorgenson's neoclassical model of a dual economy sees the agricultural sector characterized by constant returns to scale with all factors variable as given by Cobb-Douglas production function:

$$Y = \mathfrak{C}^{\alpha t} \ L^{\beta} \ P^{1-\beta} \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \ (1)$$

Where Y represent agricultural output, $\mathfrak{C}^{\alpha t}$ is technical change which takes place at a constant rate (α) in the time (t), L is fixed quantity of land available in the economy, β is the share of landlords in the product which takes the form of rent, P is total population in this sector, and $1-\beta$ is the share of labour in product paid.

Since the supply of land (L) is fixed, the equation can be written as

$$Y = \mathfrak{C}^{\alpha t} \ P^{1-\beta} \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(2)$$

To obtain agricultural output per man, that is, the per capita share of agricultural productivity; both sides of the equation (ii) is divided by total population (P)

$$y = \mathfrak{C}^{\alpha t} \ P^{-\beta} \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots...(3)$$

Now differentiating equation (iii) with respect to time, thereby finding the effect of time change on agricultural output

$$y = y \ [\ \alpha - \beta\_ \ ]$$

$$y/y = \alpha - \beta \mathfrak{C}_{P} \ {}_{P} \ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(4)$$

where α is the rate of technical progress, β is the share of landlords in the product and $\mathfrak{C}$ is the net reproduction rate.

According to Jorgenson, depending on the condition of production and the net reproduction rate, the agricultural sector is characterized either by a low level equilibrium trap in which output of food per head is constant and population and food supply are growing at the same positive rate ($\alpha - \beta \epsilon$), or by a steady growth equilibrium in which output per head is rising and population is growing at its physiological maximum rate. The necessary and sufficient conditions for a positive growth of output in the agricultural sector are that $\alpha - \beta \epsilon > 0$.

4.0 METHODOLOGY AND ANALYSIS OF DATA

4.1 Model Specification

In enhancing agricultural productivity enough to engulf rural poverty and create appropriate positive externalities for the industrial sector, increasing opportunities for technical progress is the required and sufficient condition The study formulates this model:.

$$Y = f\,(AGREXD,\ AGRXP,\ CBAC,\ FETDIST)\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (5)$$

Where Y represents Agricultural Output

AGREXD represents Agricultural Capital Expenditure

AGRXP represents Agricultural Exports

CBAC represents Commercial Bank Agricultural Credit

FETDIST represents Fertilizer Distribution

In linear form;

$$Y = \alpha_0 + \alpha_1 AGREXD + \alpha_2 AGRXP + \alpha_3\,CBAC + \alpha_4\,FETDIST + U_0 \ldots\ldots\ldots\ldots\ (6)$$

where the coefficients of $\alpha_1,\ \alpha_2,\ \alpha_3,\ \alpha_4 > 0$. The apriori expectations are that: $\partial Y\,/\,\partial AGREXD > 0$, $\partial Y\,/\,\partial CBAC > 0$, $\partial Y\,/\,\partial FETDIST > 0$ and $\partial Y\,/\,\partial AGRXP > 0$.

The differenced model can be written as:

$$\partial Y = \alpha_0 + \alpha_1 \partial AGREXD + \alpha_2 \partial AGRXP + \alpha_3 \partial CBAC + \alpha_4 \partial FETDIST \dots\dots\dots\dots (7)$$

4.2 CO-INTEGRATION TECHNIQUE RESULTS

Most studies assume that time series data are stationary. However, it has been argued that this assumption is not appropriate for most economic variables and that these variables are better modeled as integrated of order one I(1) processes, that is, non stationary and needs to be differenced once to become stationary. A non-stationary series can be reviewed as a testable hypothesis by performing unit root test. A test for unit root has its origin in the work of Fuller (1976) and Dickey and Fuller (1979, 1981). The theory of co-integration arises out of the need to integrate short run dynamics with long run equilibrium. The summary of these tests is presented in Tables 4.1 and 4.2 respectively. Each test was conducted using Augmented Dickey Fuller (ADF) tests.

TABLE 4.1 STATIONARY TEST AT LEVELS

VARIABLES	ADF	ORDER
AGREXD	-2.331901	I(0)
AGRXP	-1.149697	I(0)
CBAC	0.205557	I(0)
FETDIST	-1.887387	I(0)
Y	0.632497	I(0)

Source: Authors' Computations using Eviews 5.0

TABLE 4.2 STATIONARY TEST AT FIRST DIFFERENCE

VARIABLES	ADF	ORDER OF INTEGRATION
AGREXD	-7.443584*	I(1)
AGRXP	-4.976191*	I(1)
CBAC	-3.246051*	I(1)
FETDIST	-5.147506*	I(1)
Y	-3.851374*	I(1)

Source: Authors' Computations using Eviews 5.0

ADF means Augmented Dickey Fuller

* Significance at 5% level

Decision Rule:

If ADF_s > critical value – stationary

If ADF_s < critical value – Non stationary

4.2.1 INTERPRETATION OF RESULTS

As a preliminary step for testing for co-integration and error correction model, we start by testing the stationarity of the variables. The ADF tests were carried out. The observed values (ADF values) were found to be lower than the tabulated critical- values in absolute terms at the 5 % level of significance. Thus, we conclude that variables are random walks or non-stationary and there is the existence of a unit root (Table 4.1). This confirms the hypothesis which says that time series data is usually non-stationary.

The first difference stationarity test is then attempted. The results show that the observed values are significantly greater than the critical-values also in absolute terms at the 5% level of significance. Differencing the variables once produces stationarity. This implies that the variables are I(1) series. That is integrated of order 1. (Table 4.2).

4.3 ERROR CORRECTION MODEL (ECM)

Given that the residuals from the above co integration regression are stationary, and that the variables are co-integrated, the third stage proceeds to estimate the error correction representation. The ECM incorporates the full (short run) dynamics of the model specified above. At this stage all the conventional statistical tests of significance are considered to be appropriate including the diagnostic tests for the assessment of the adequacy of the model. Co-integration is a necessary condition for error correction model to hold. The purpose of the ECM is to switch to a short run model. Allowance is made for any short run divergence, in a corrective mechanism by which previous disequilibria in the relationship between the level of money balance and the level of one or more of its determinants are permitted to affect the current change in money holdings. Theory expects that the ECM be negative and highly significant implying that an error in the current period is being corrected in the previous period.

The PARSIMONIOUS EQUATION (ECM) for agricultural output is presented thus:

$DY = 1191.672 - 0.256DAGREXD + 7.69DAGRXP + 0.517DCBAC + 5.840DFETDIST +$

    (1.54)   (-3.25)   (5.02)   (2.34)   (2.17)

$0.209DAGREXD (-3) + 3.292DAGRXP (-1) + 3.958DAGRXP (-2) + 3.589DAGRXP (-3) -$

    (2.27)   (2.66)   (2.81)   (2.69)

$3.69DFETDIST (-2) - 0.521ECM (-1)$

    (-1.63)   (-2.74)

$R^2 = 0.665$; $R^2 = 0.497$; $F_{(4, 30)} = 3.966$; D.W. $= 1.99$

4.3.1 INTERPRETATION OF RESULTS

The estimated result shows that there is an indirect relationship between agricultural capital expenditure and agricultural output. The implication is that holding other variables constant, a unit increase in AGREXD will result in a decrease in agricultural output by 0.256. This is non-consistent with economic a priori expectations. The estimated result also revealed that there is a direct relationship between commercial bank agricultural credit and agricultural output. Implication of this result is that holding other variables constant, a unit increase in CBAC will increase agricultural output by 0.517. The estimated results shows a direct relationship between agricultural export and agriculture output, this implies that holding other variable constant, a unit increase in AGRXP will increase agricultural output by 7.695. The estimated result revealed that there is a direct relationship between fertilizer distribution and agricultural output, it implies the, holding other variables constant, a unit increase in FETDIST will increase agricultural output by (5.84).

4.4 FINDINGS

The result from the test of the hypothesis shows that all variables were important determinantS of agricultural output in Nigeria within the period under investigation, that is, all the variables put together were significant in determining variations in the dependent variable. From the result, it was found that agricultural output is more sensitive to changes in agricultural export, that is,

the knowledge of the fact there is an already external market for agricultural products enhances its production; enhancing opportunities for cross border sale of agricultural products through creation of good road network, efficient transport system and creating storage facilities that could preserve products in anticipation of demand and establishing flexible sale policies and efficient pricing techniques enhance the level of agricultural productivity. Also, the fertilizer distribution induced variation on agricultural output is high while variation exerted by commercial bank agricultural credit is minimal.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

There is an African saying "*that once the problem of food is addressed in the life of a poor fellow, the poverty level has been substantially solved.*" We hold the view that there is a direct correlation between the level of economic growth in Nigeria and the development of agriculture. This goes without saying that any policy thrust that addresses poverty, would inevitably focus on agriculture, by increasing rural opportunities that could generate agricultural-induced development. Hence, the development of agriculture is a sine qua non for alleviation of poverty, hence the Nigerian Government should lay much emphasis on its encouragement.

5.2   RECOMMENDATIONS

Having investigated empirically the effectiveness of the agricultural sector on the economic development of Nigeria; it will be necessary to offer the following recommendations based on the empirical findings:

- Establishment of agricultural fund to finance and facilitate medium/large scale agricultural production, credit should be granted to farmers who are ready and willing to embark on medium/large scale farming to enhance employment, production for local consumption and for export in order to generate foreign exchange revenue for the Nigeria. The essence of the Fund is to address the most basic constraints facing agriculture, which is funding; and the disbursement of such funds should be through banks, which would do normal credit appraisal and rating.

- Harmonization of agricultural research institutions, it is widely accepted that research and technology are the vehicles on which agricultural development move forward. A thorough analysis of the objectives, roles and activities of each institute should be made with a view to streamlining their operations for better and effective performance. The focus of the institutions should be to enhance yield in agricultural production through continuous research that would bring in new seedlings etc. Also, there is the need to commercialize research findings, government should set up Research Grants to assist research institutes execute research projects. The results can thereafter be sold to venture capitalists, commercial enterprises, or even purchased by the government itself. This would go a long way in encouraging researchers to embark on commercially viable studies in agriculture.

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