

Economic Diversification in Recession: a Case of Nigerian Agriculture as a Sign Post for National Development and Sustainable Growth

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Abstract

Nigerian economy after 56 years of independence, has witnessed once again a downward trajectory in her efforts to achieve sustainable development. The current world statistics in African economy in the mid-year of 2016 has rated Nigerian economy as second largest economy next to South Africa with Gross Domestic product (GDP) of \$296 billion U.S. dollars. South Africa economy was considered as the largest economy in African continent with GDP of \$301 billion U.S. dollars during the second and third quarter of 2016. This is a reversed trend. In 2014 Nigerian economy was rated as the largest and leading economy using 2014 rebase figures. Recently, International Monetary Fund (IMF) observed that by the end of the year (2016) Nigerian economy would be the largest economy in Africa with GDP of \$415 billion U.S. dollars. The present recession faced by the economy has led to a negative growth of 2.06% on the first and second quarters of the year (2016). Economic diversification discourse in recent times in the country with regard to policy of 'BUHARINOMICS' (i.e. change Agenda) as an attempt to re-engineering the economy is focused and dominated on development of agriculture and other non-oil exports. Agriculture has become an arrow head and engine for economic recovery, growth and diversification. This study therefore examines the significant role and obvious comparative advantage of agricultural production as an intervention variable to solving poverty and economic recession. To this end, the paper adopts historical, evaluative and current issues or perspectives to analyze the importance of the sector to Nigerian economy. Neoclassical model and Agricultural Development Strategy were incorporated into the study to investigate and analyze constraints and challenges in Nigerian agriculture which has been abandoned for decades because of wealth of oil and gas production (Dutch Disease). In order to make the sector a sign post for accelerated growth and development, the paper concluded that increased expenditures (i.e. spending), savings and capital investments by government and private initiatives must be sustained in the sector. This would quicken recovery and induce increased agricultural productivity in the economy thereby leading to forward and backward integration in the economy. DDDDD

Keywords:

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Background of the Study

The year (2014) rebase figures of the country considered Nigerian economy as the largest economy in Africa. The current economic statistics reveals South African economy as the largest economy with Gross Domestic Product (GDP) of \$301 billion U.S. dollars as against Nigerian economy of GDP of \$296 billion U.S. dollars (Channel News, 2016). The recent collapse of oil prices in the global economy and unrealistic exchange rate regime in the economy, have affected and impacted negatively on the economy, resulting into a downward trend on the resource and revenue base of the government. The estimated annual growth rate of Nigerian economy in the first and second quarter is now -2.06% to the Gross Domestic product (GDP) while South Africa is estimated at 3% growth rate (Channel News, 2016). This negative economic indicator has taken toll on the economy resulting into high rate of unemployment put over 30% (channel News, Op. cit) and worsened socio-economic condition of the citizens. As if that was not enough, the monocultural nature of the economy with long period of reliance on crude oil exports to the neglect of other real sector such as agricultural constituted a major albatross to economic diversification

Moreover, the lack of political will of the successive governments, political class and elites coupled with endemic corruption in the system, are some of the factors that have snowballed the economy into present economic distress. The major factors accounting for the relative decline of the country's economic fortunes are easily identifiable as political instability, lack of focused and visionary leadership, economic mismanagement and corruption (Sanusi, 2010). Nigeria happens to belong among the few that have greatly retarded from their past glorious heights in agriculture down to zero scale of production. Surely this neglect is because of irresponsible and ill-purposeful leadership (Mathew and Adeboye, 2016). The basic fact is that Nigerian economy is a satellite economy of international monopoly capital. It is an economy characterized by primary production and highly import dependent. This makes the economy vulnerable to the cyclical variations and swings or shocks of the global economic crisis.

Agriculture is the main stay of the economy of any nation, and we have to look inward to make the sector a high priority by developing and exploiting the resources of the sector (without paying lip service) for the welfare of the citizens. It is noted that agricultural sector made Brazilian economy to out weight that of all other South America countries and is expanding its presence in the world market (Brown, 2000:172). The trauma of first and second petroleum crises of 1970s and 1980s made Brazil to look inward to effective diversification of its agricultural sector which made Brazil to possess large and well developed agriculture, mining, manufacturing and services sectors (Ogen, 2007).

Paradoxically too, the vast and copious nature of resources and wealth in the oil and gas sector have not benefited the large majority or the citizens. The resources of the sector have been pillaged by few, resulting into what economists could refer to as 'resource curse'. The abundant resources in the up and down stream sub-sector of oil production have fuelled up official and endemic corruption, economic sabotage, infrastructural deficit and ethnic cum class struggle among the powerful elites and the political class, for the 'gold' of Niger Delta. Nigeria witnessed oil boom in the 1970s and the concentration on the oil and gas production has led to the denial of attention on other real sectors of the economy such as agriculture and

manufacturing. Inadequate funding and investment in agriculture from the oil and gas wealth has left agricultural sector in a lurch and uncompetitive to promote forward and backward integration. This has hindered the much needed transformation of the economy in the last four decades (Sanusi, 2010).

Agricultural development strategy is necessitated by growing calls for economic diversification as witnessed under the global economic crisis. Indeed, economic diversification into non-oil sector has become a recurring feature of national public policy discourse reflecting general recognition of the need to reduce reliance on crude oil (Edoh et. al., 2010). Wikipedia (2013) reported that World Bank has estimated that as a result of corruption, 80% of the energy revenue of the oil sector benefited only 1% of the population. This situation has deepened unequal distribution of income and wealth among the population thereby leading to extreme personal poverty and material deprivation among the citizenry.

Eliminating corruption is important for development. Honest government may promote growth and sustainably high incomes. Eliminating corruption with public empowerment suggest that it is a direct objective of development... because effects of corruption fall disproportionately on the poor and are major restraint on their ability to escape from poverty. This is perhaps the most compelling reason for emphasizing the elimination of corruption and improvement of governance in general as part of anti-poverty strategy from the earliest stages of development (Todaro and Smith, 2009:p.567). This forms the basis of economic blueprint of 'BUHARINOMICS'.

Prior to Nigerian civil war, and immediately after the war, the country was self-sufficient in food production. Nigerian Agriculture sector has the potentials for production of varieties of food and cash crops coupled with vast fertile land of the country. But today the country has become a net importer of food at exponential rate. The contribution of the sector to the Gross Domestic Product dwindled, from 60% in 1960s to 22% in 1980s (NBS, 2012). From 1980s to date, the contribution of agricultural sector to GDP has only shown a marginal percentage increase. In 2010, Nigeria spent enormous amount on food imports. A total of \$635 billion U.S. dollars was spent on importation of wheat, \$356 billion U.S. dollars on rice, \$217 billion U.S. dollars on sugar and \$97 billion U.S. dollars on fish imports even though Nigeria is rich in marine resources (Omorogbeet, al., 2014).

In view of this scenario, the following research questions are asked:

- i) What then has gone wrong with Nigerian agriculture for its inability to provide food sufficiency?
- ii) To what extent can agricultural production be used as a tool of economic recovery?
- iii) What are the potentials the sector offers for sustainable economic growth despite the many years of neglect?

These are the questions that have motivated this study.

To provide the answers, the study is poised to achieve the following objectives:

- i) To determine the major constraints and challenges of Nigerian agriculture.
- ii) To review theoretical related literature on economic growth models and its application to Nigerian agriculture.
- iii) To examine the importance and role of agricultural sector to macroeconomic aggregates as determinants of growth.
- iv) To recommend various policy options that could stimulate and induce economic recovery using agriculture as a spring board for diversification.

The content of the paper stands to benefit the government and other operators of the economy on the importance of agricultural production and development as an alternative gateway to national economic recovery and integration.

Thoughts on Related Economic Growth and Development Models

Essentially, economic growth and development refer to a sustained increase in real output of goods/service accompanied by changes in the economic structures, values and institutions. It means improvement in the social, political and economic lives of the people. It is a period of sustained growth in material well-being, per capita real income, happiness and welfare, wealth of the people. It must also include changes in the physical reality and also state of mind of the people through social, economic and institutional process targeted towards obtaining a better life for the citizens (Todaro and Smith, 2009).

Economic growth being a sustained increase in volume and value of output of goods and services in the economy over a period of time presents dynamics that are propelled by the existence and exploitation of natural resources and primary products (sanusi, 2010). After the Second World War II, most literature on economic development theory and models has been dominated by four major competing thoughts or strands:

- a. The linear stages of growth model
- b) Theories and patterns of structural change
- c) International dependence revolution and
- d) Neoclassical counter revolution (free market fundamentalism) [Todaro and Smith, 2009].

Major economic models for growth and development in 1950's and 1960's viewed process of economic growth as successive strata that all countries of the world must experience before achieving development and diversification of their economies.

The dominant paradigm was that developing countries must follow the path of economic success of the developed countries if they were to achieve aggressive economic growth and integration. It is a known fact that most economies of developing countries are essentially agrarian economies based on subsistence production while lack basic modern economic structures. To modernize and revitalize them, they must increase savings and aggregate investment in the economy leading to accumulated capital stock. This is principle of capital fundamentalism.

The conceptual tool and apparatus to achieve this was the linear stage theory of W.W. Rostow (1960) called Rostow's Stage Theory of Growth. He propounded that all economies are within five (5) stages of economic growth and development: the traditional society, the pre-condition for takeoff into self-sustaining growth, the stage of takeoff, the drive to maturity and the stage of high mass production and consumption. He argued that all advanced countries had passed through the "take off" stage into self-sustaining growth. The under developing countries are still either in the traditional or 'pre conditional' stage and they need to follow a certain set of rules of development to take off in their turn into self-sustaining economic growth. He suggests that the principal strategies of development that are necessary for any 'take off' stage are the mobilization of domestic and foreign savings in order to generate efficient investment to accelerate economic growth.

Harrod-Domar growthmodel (1939) supported Rostow's model through statistical and quantitative analysis of savings and investment mechanism for growth. He demonstrated that countries with higher savings ratio are expected to grow faster than those with lower rates. The main obstacle to development is the relatively low level of new capital formation in developing countries. He examined the relationship between the net saving ratio (s) and capital-output ratio (K) with a simplified model. That is net savings (S) are proportion of national income (Y). That is output of national income (Y) is an induced function of saving.

$$S = sY \dots \dots \dots \text{equation (1)}$$

Net investment (I) is as change in the capital stock (K) as seen in equation (2) below:

$$I = \Delta k \dots \dots \dots \text{equation (2)}$$

Capital-output ratio is stated below because capital stock (i.e. net investment) bears direct relationship with national output or income (Y)

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$$k/Y = k \dots \dots \dots \text{equation (3)}$$

Or

$$\Delta k / \Delta Y = k \dots \dots \dots \text{equation (4)}$$

$$\therefore \Delta k = k \cdot \Delta Y \dots \dots \dots \text{equation (5)}$$

Since net savings must be equal to net investment

$$S = I \dots \dots \dots \text{equation (6)}$$

Then

$$S = sY = I = \Delta k = k \Delta Y \dots \text{equation (7)}$$

We have:

$$sY = k \cdot \Delta Y \dots \dots \dots \text{equation (8)}$$

If we divide both sides by Y and then by k , thus we have:

$$\Delta Y/Y = s/k \dots \dots \dots \text{equation (9)}$$

Harrod-Domar theory of economic growth states that the rate of growth of Gross Domestic Product i.e. national output or income ($\Delta Y/Y$) is determined jointly by net national saving ratio (s) and the national capital-output ratio (k). The justified position of Harrod-Domar model is that output can increase in the economy through increased net savings and investment which leads to accumulation of capital stock.

The theorists of structural change model focus on the approach by which developing countries can transform their economies from traditional subsistence agricultural production to a more modern industrially diverse sector with services and manufacturing oriented. A. W. Lewis (1950) was one of the renowned advocates of structural change model with his two sector analysis. Lewis believes that the traditional agriculture subsistence sector is over populated with labour supply which is characterized by zero marginal labour productivity. He suggests that this surplus labour in the traditional sector could be withdrawn from the sector without loss of output to highly productive modern industrial sector to achieve economic growth. The failure of the Lewis model to meet the challenges of the realities of contemporary developing countries led to emergence of the international dependence revolution model that believe the developing countries are beset by institutional, political and economic rigidities both domestic and international and they are caught in a dependent and domestic relationship with the rich Western countries.

The international dependence revolution model of growth consists of stream of thoughts such as neo-colonial dependence model, the dualistic development thesis and false paradigm model. The neocolonial dependence model which is of more neo Marxist thinking attributes the existence and continuance of under development primarily to the historical evolution of a highly unequal international capitalist system of rich and poor country relationships. The model believes that co-existence of rich and poor nations in an international system is dominated by such unequal power relationship between the Centre (developed countries) and periphery (satellite or LDCS) renders the attempts by poor nations to be self-reliant and independent difficult and sometimes even impossible. It concluded that certain group of people who are power elites (i.e the comprador bourgeoisies) such as land, Lords entrepreneurs, military rulers, politicians, merchants, salaried public officials and trade union leaders who enjoy high income, social status and political power who constitute a small elites ruling class work to perpetuate and maintain the international capitalist system and its exploitation.

The false paradigm model attributes under development of the Less Developing Countries (LDC) to the faulty and in appropriate advice provided by well-meaning but uninformed international 'experts' from developed countries under the auspices of various international agencies and institutions such as World Bank, United Nations, European Union, International Monetary Fund (IMF) and a host of other international monopoly capital and multilateral donor agencies. Most of the so called experts from these international institutions give misleading models of development which are not consistent with the reality

of LDCS leading to inappropriate or incorrect but confused policies that are incapable of stimulating growth.

The Dualistic Development thesis of growth embraces the notion that the world is of dual societies of rich and the poor nations. The developing countries represent pockets of wealth within broad areas of poverty (e.g. Nigeria's oil wealth and citizens' abject poverty). The model represents the existence and persistence of substantial and ever increasing divergences between the rich and the poor nations and between rich and poor people's on various levels.

Finally the Neo-classical counter revolution model of growth believes essentially in market fundamentalism. This model takes its root from major western developed countries such as United States, Canada, Britain and West Germany. The Neo-classical counter revolution theory of growth is based on principle of less or non-government intervention in the economies of the LDCS, (concept of Laissez faire). The model calls for freer markets and the dismantling of public ownership, statist planning, and government regulations of economic activities. They believe in the principle of 'market place' and invisible hand (i.e demand and supply) to guide resources allocation in the economy. To them state intervention in the economy of LDCS slows down the pace of economic growth.

The ideas of neo-classical counter revolution is based on Neo-liberalism concept that emphasize competitive free market ideology, privatization of state owned enterprises, free trade policy, quest for foreign investment, large scale multinational corporations presence in the economy, elimination of price distortion and corruption, government regulations and export expansion through trade as well as organized commodity and factor markets coupled with sound economic incentives (profits) are major variables that could remove the symptoms of under development of LDCS. The idea of the model (Neo-liberalism) has permeated to developing countries (LDCS) today inform of globalization, privatization, structural adjustment programs, presence of multi-national corporations, foreign monopoly capital, technical aids and supports, bilateral and multi-lateral financial assistance, grants and a host of others which are germane to capitalist development of market fundamentalism. All these models of economic growth are reflections and perspectives of Nigerian economy. The appropriateness of these models to Nigerian economy depends absolutely on the features or realities inherent in the economy and process of development of the nation. In all, therefore for a developing country most of the models are important but the selection of which to apply in a particular economy should be done with great caution (Sanusi, 2010).

Models for Agricultural Production and Transformation

i) Uni-modal and Bi-modal strategy.

Empirical studies have elucidated and shown that there are little evidences to prove that developing countries (LDCS) could launch a successful economic transformation without going through an agricultural revolution on a country wide basis (Omorogbe et al., 2014). It has also been observed that by most recent development models that economic growth based on industrialization to the neglect of agriculture is bound to be constrained by the drain of food and resources as well as narrow domestic markets for industrial products (Hayami,

2015). This is because even heavy capital investment stock in industrial enclave has been unable to generate full employment for rapidly increasing labour force in the industrial sector. Hence the need for transformation of agricultural sector.

Unimodal agricultural strategy which goes with green revolution programs in mid 60^s (a development and diffusion of new food, cereal varieties in the tropics) has proved that agrarian economies of developing countries are capable of accepting modern technological inputs and achieving rapid productivity increase in agricultural sector. Requirements for agriculture to provide food and resources for non-agricultural sector during the process of structural transformation are especially large in developing countries today because of the explosive rate of population growth (Johnson and Kilby, 1975).

The technology gap between developed and developing countries, if properly taken advantage of and exploited by developing world, agricultural sector could be made more labour intensive and absorptive, thereby providing the basis for rapid growth in the sector in terms of productivity and food security. This perception led to the development of unimodal strategy by Johnson Bruce and Peter Kilby. The model facilitates the mobilization of resources of mass of small producers (i.e Peasant farmers) in agriculture and at the time maximizing labour intensity in urban industries. It recognizes that low capital intensive industries (i.e Small and medium scale industries) which are basically of labour absorptive should be established to provide complementary inputs such as small machines fertilizer, herbicides, and improved seedlings (etc) to agricultural sector.

These labour absorptive industries are the industries that would provide and promote manufactured farm inputs that would complement agricultural development. The model is considered optimal and designed to achieve a uniform increase in agricultural productivity of mass of peasants in developing countries through diffusion of labour intensive agricultural technology. The diffusion of labour intensive agricultural technology requires the supply of relatively simple but improved machinery and equipment that domestic manufacturing firms are capable of providing with labour intensive methodology.

It will also lead to uniform growth in the level of income of peasant farmers and their households which would generate a large demand for simple consumption of goods and services to meet their basic needs which are produced at low capital intensity. The model is therefore set to achieve the following:

- (i) Stimulates the development of labour intensive small scale industries and accelerate the structural transformation of the agricultural sector.
- ii) It lessens disparity in terms of income and wealth in the rural and urban sector.
- iii) It adopts technologies, techniques and bio-chemical inputs which are relevant to local resources and adaptation with low import contents.
- iv) It ensures land reforms and redistribution to peasant farmers who have no land for farming and those who have small size of land are given more. This reduces the disparity between the small and large scale farming.
- v) This strategy also provides farm credits and subsidies to the small scale farmers.

- vi) The model leads to gradual modernization in the agricultural sector and reduces level of socio-economic disparity in the rural sector.
- (vii) It maximizes employment both in agricultural and industrial sector.
- (viii) It leads to dual goals of efficiency and equity in production (Hayami, 1977).

Nigeria today, in view of our high population growth and high level of unemployment the agricultural sector can be raised to the status of labour absorptive and intensive capacity to meet the challenges of the accelerated growth in our population. The model could serve as an alternative strategy of exploiting the natural resources in the sector, using labour intensive technology which has a favorable disposition and adaptation to the immediate environment of the peasant farmers that constitute the major producers of staple food crops in the country today. The success of unimodal model has been seen in England, United States, Japan, Taiwan, Mexico and Russia. The success of Unimodal strategy depends always on the promotion of intersectoral interaction (i.e forward and backward linkage effects) between agricultural sector and modern sector industrial.

In contrast, the bi-modal strategy of Johnson and Kilby is characterized by concentration of modern inputs and technology in agricultural sector consisting of large scale commercial farms. This strategy is highly capital intensive and is capable of generating high rate of agricultural employment and output growth. The model accommodates the use of capital intensive method including tractors, farm thrashers, harvesters, pumping machines, equipment, bio chemical inputs such as High Yield Variety Seeds (HYVS), fertilizers, pesticides, insecticides irrigation schemes and other capital inputs necessary for commercial farming as well as application of foreign skills and expertise in agricultural production. The strategy supports large scale farming system using mechanized and biochemical technologies or inputs to increase agricultural production.

The bi-modal strategy leads to production of two types of commodity being produced in the rural sector. These are traditional agricultural commodities produced by traditional system of small scale peasant holdings and modern agricultural commodities produced by modern system of large scale farming using modern technological and biochemical inputs in production. The two mode of production would exist side by side in the rural economy thereby leading to increased agricultural output. The following complementary programmes could be used to support the bimodal and the unimodal strategy:

- (i) Institution building relating to such activities as agricultural researches and educational programmes for peasant farmers.
- (ii) Programmes of investment in infrastructures such as irrigation and drainage facilities.
- (iii) Programmes to improve product marketing and inputs distribution outlets.
- (iv) Price efficiency for agricultural products and optimal use of existing resources to change existing social setting or conditions.
- (v) Efforts to stem the gap between efficiency and equity in terms of income and wealth distribution among the farmers. This will enhance the welfare of the farming population.

Theory of Peasant Behavior as Empirical Analysis

The theory of peasant behavior as put forward by T. W. Schultz is another lesson for Nigerian agriculture. Shultz's theory of traditional agriculture tries to explain the desire of the developing countries to transform traditional rural agricultural society for increased food production and overcome misery of hunger, illiteracy and other social vices that are inimical to development.

The hypothesis is designed to get peasant farmers to modernize agricultural production techniques and output in the sector, (i.e. increased value chain). The study examined the efficiency with which farmers within traditional agriculture allocates factors of production at their disposal, ensure of price efficiency, mobilization of resources and its utility maximization. The study reveals that farmers are more efficient in re allocating factors of production in current agriculture and no significant indivisibilities in either production or factors of production. Both product and factor prices are flexible and that, there is no unemployment or underemployment or zero marginal product of labor ($MPL > 0$) in peasant traditional agriculture.

This was against the view of Arthur Lewis that traditional agriculture operates at zero marginal productivity ($MPL=0$) of labor at a certain stage when diminishing returns set in. Shultz emphasizes that farmers respond to profit where marginal cost is equal to marginal revenue ($MC=MR$) and individual utility maximization is also the maximization of the utility of the whole community $(\frac{Mux_1}{Px_1} = \frac{Mux_2}{Px_2} = \dots = \frac{Mun}{Pn})$.

Hence this constitutes a signpost for Nigerian agriculture that when resources are fully mobilized in the sector, farmers can competitively allocate and re-allocate existing factors of production (i.e resources) through efficient methods to increase output and wealth in the agricultural sector.

Trend Analysis of Nigerian Agricultural Policies and a Glimpse at Agricultural Development

Nigerian economy can be classified into three (3) major sectors: (i) Primary sector: agricultural and natural resources, (ii) Secondary sector: processing and manufacturing and (iii) Tertiary sector: services. The agricultural and industrial sectors exhibit a structural dualism where the former operated subsistence production with modern farming while the latter comprises of modern enterprises which coexist with large numbers of micro enterprises especially in the informal sector. Nigerian agriculture is the main stay of the economy and the major food supplier and earner of foreign reserves in 1960s and 1970s. It has the traditional role of providing food for the population, raw material for industries and substantial surplus for exports. Nigeria was a leading exporter of other major commodities such as cotton, groundnut, rubber and hides and skins (Alkali, 1997).

Agricultural sector contributed over 60% to the GDP in 1960s despite the reliance of Nigerian peasant farmers on traditional tools and indigenous farming methods and these farmers also produced over 70% of Nigeria's exports and 95% of its food needs (Lawal, 1997). But today the

contribution of the sector to the total GDP has fallen over the decades from a very dominant position of 55.8% of the GDP in 1960-70 to 28.4% in 1971-80 before rising to 32.8, 34.2 and 40.3 during the decades of 1981-90, 1991-2000 and 2001-2009 respectively. The fall is not because of a strong industrial sector that is displacing agriculture but largely as a result of low productivity owing to the dominance of peasant farmers and their reliance on rudimentary farm equipment and low technology (Sanusi, 2010).

The root of the crisis in Nigerian agriculture also lies in the total neglect of the sector by successive government through payment of lip service to the sector. The increased dependence on a mono cultural economy based on oil production (Ogen, 2007) is another factor. A case of Dutch disease. It is disheartening that by mid 1970s, Nigeria became a net importer of various agricultural products ranging from palm oil, cotton, wheat, rice, maize to other agricultural products. For instance, Nigeria has been spending an average of 60 million USD on importation of rice annually and indeed in 1994, agricultural sector performed below the projected 7.2% of the budgetary output (Lawal, 1997)

Wikipedia (2013) noted that Nigerian economy is ranked 26th in the world in terms of Gross Domestic Product (GDP) and it is on track to become one of the 20 largest economies in the world by 2020. Nigerian agricultural has adequate capacity to engineering the economy towards successful development of vision 20:2020 agenda for Nigerian economy despite the many years of mismanagement, inconsistency, inadequate infrastructure, ill-conceived government policies, neglect and lip services to the sector. This is achievable if the country decides to take advantage of the present world oil glut and fallen prices to develop agricultural sector. What are the policies direction and trend over the years for agricultural production and development?

In line with the vision: 2020 economic transformation agenda, agriculture has been assigned strategic function to drive the overall economy by accelerated increase in productivity (Eboh, 2010) Nigeria agriculture remains a key determining influence on overall economic growth in the country's economy. Agricultural policies from early 1960s when the sector contributed largely to domestic food consumption and exports were essentially to support farmers and institutional fiscal policy of revenue generation for the government. The post-colonial Nigeria agriculture was a period of agricultural production based on commodity market boards on regional basis. The boards engaged in marketing, processing, grading and pricing of agricultural produce for exports. Major cash crops or produce were cocoa, groundnut cotton, palm produce, rube and grains.

The boards were characterized with inefficiency and lack the ability to develop technological path that would guarantee commodity value addition or chain, rather produce were merely exported to earn revenue for the government. The period between 1962-1974 governments policies in agriculture were mainly oriented to using marketing board taxation (i.e revenue) to finance development of the overall economy (Idachaba, 2000)

In 1970s to 1980s various interventionist programs and policies were shoveled and railroaded into the agricultural in order to develop the sector. The oil boom era in 1970s increased the level of neglects of agriculture because the oil wealth led to dramatic upsurge in food and raw

materials importation for population and industries respectively. Eboh et al (2010) observed that the pre dominant reliance on imported raw materials under import substitution strategy, it is apparent that the country's agricultural processing system lacks the capacity and responsiveness to meet the demand of industrialization. Government efforts to restore dignity of agriculture were seen in popular programs such as establishment of Nigerian Agricultural Co-operative Bank (NACB) in 1973 to provide farm credit and capital to farmers. Farm Settlement Schemes (FSS), Agricultural Development Projects (ADPs), River Basin Development Authorities (RBDAs), National Accelerated Food Production Programs (NAFPPs), Operation Feed the Nation (OFN), Green Revolution (GR), Back to Land programs, National Agricultural Land Development Program (NALDA) and a host of others.

In 1975 government demonstrated high involvement in agricultural production on commercial levels. Nigerian agriculture became directly involved in commercial production of food crops, having several large scale agricultural projects specializing in the production of grains, livestock, dairies and animal feeds to mention but a few (Ogen, 2007). Sugar factories were also established in Numan, Lafagi and Sunti (Lawal,1997). To complement the functions of Nigerian agricultural and co-operative bank, led to the establishment of Agricultural Credit Guarantee Scheme Fund (ACGSF) through the Central Bank to provide credit and collateral for small and medium farm holdings and other commercial farming to increase food production.

Calabar Export Processing Zone and that of Lagos, Enugu and Kaduna were extensively structured to specialize in the production of food and cash crops for exports and national food security. National Development Plans had lofty ideas and objectives of making agricultural sector to develop capacity to process agricultural raw materials for local industries and for exports significantly by increasing the contribution of agricultural sector to the GDP (Lawal,1997). However, these lofty ideas and objectives were truncated by official corruption and lack of commitment on the part of those that are saddled with the responsibility of implementing the government agricultural policies (Ogen, 2007).

Efforts of government were also seen in the areas of giving concessionary tax terms (incentives) for investments in agro-allied processing industries and reducing importation of some agricultural products. These agro-allied industries were in the areas of textile, brewery, beverages barley production and confectionaries. Above all, the major problems with these programs and policies were that they lack synergy between agricultural production and post-harvest development (i.e. industrial production) which remains a major drawback in Nigeria value chain in agricultural development (Eboh et al. 2010) This means agricultural sector with all these policies and programs failed to provide backward and forward linkage effects and integration with other sectors of the economy.

The mid 1980s witnessed a structural adjustment program of International Monetary Fund (IMF) being foisted on Nigerian economy by Babangida regime. This led to deregulation of government policies in the economy and promote market oriented initiative in agricultural production, marketing and processing. Private capital participation in agriculture was strengthened through the establishment of Export and Import Bank (NEXIMB) to stimulate agricultural productivity. Government also established agencies such as National Directorate

of Food, Roads and Rural Infrastructure to support and correct infrastructural deficits in areas of good road network, water supply, storage facilities, electricity etc in agricultural production. Eboh et al. (2010) noted that better infrastructure, fiscal incentives and improved technologies were critical requirements for rapid growth and development of agricultural sector. The economy was placed on economic blue point of “guided deregulation syndrome” till the year 2000.

Nigerian agriculture is presently transformed under the policy of privatization and commercialization through the instrumentality of small, medium and large scale enterprises. The D-8 countries of Ministers of agriculture of which Nigeria is inclusive has mandated private sector through mutual public-private partnership to ensure availability of quality seeds, animal feeds, fisheries and fertilizers to agricultural sector (Yusuf, 2013).

In 2004, the Federal Government launched National Economic Empowerment Development Strategy both at National and State levels called NEEDS and SEEDS, to ensure sustainable growth in agriculture and other sectors of the economy. Agriculture was part of the strategy to ensure institutional efficiency, effective service delivery, competition, efficient resources utilization and commodity development in the sector. FMINO (2006) as cited in (Eboh, et al 2010) reported that, commodity development efforts were boosted with the establishment of six presidential initiatives on Rice, Vegetable, Oil, Sugar, Cassava, Fisheries and Livestock respectively. The initiatives addressed full-stream development of the commodities from production, processing to handling, marketing and utilization.

The year 2007 under Yar'Adua and Jonathan administration witnessed the adoption of 7-point agenda which set a road map for economic growth and development. The agenda highlighted main goals of economic programs which include diversification of the economy, food security employment generation, economic linkages, exports, investment promotion and poverty reduction. The key elements for agricultural development are land reforms, commercial agriculture, irrigation development, institutional support and market stabilization¹. This led to massive intervention funds in agricultural sector during the regime of President Jonathan resulting into multiplicity of agricultural programs that yielded no positive impact on the sector but rather a conduit pie for siphoning the government much scarce resources and funds for agricultural development.

These programs include Agricultural Transformation Agenda (ATA), Rural Finance Programs (RUFIN), Federal Ministry of Agriculture and Rural Development Initiatives, Small and Medium Scale Farming Enterprises, Youth Empowerment Programs in Agriculture, Agricultural Festivals, Subsidy Reinvestment Programs (SURE-P) D-8 Ministers of Agriculture Initiatives, Nigerian Incentives Based Risk Sharing in Agricultural lending Project Programs (NIRSAL), Agricultural Credit Guarantee Scheme Fund (AGSCF) and Fund for Agricultural Finance in Nigeria (FAFIN).

Point Agenda of the Yar'Adua Administration, The Presidency, Abuja, May 2007. All these and host of others have not conveniently launched the sector into a dependable and sustainable agricultural transformation and development that could increase food security and foreign exchange earnings for the country.

Model Specification and its Application to Growth Prospects in Nigerian Agriculture

Model for growth in Nigerian agriculture could be fashioned after market fundamentalism. The neoclassical counter revolution model blend with Harrod-Domar classical growth theory would stimulate growth and development in Nigerian agricultural production. The false paradigm thesis, colonial dependence model and dualistic development theory are major features and characteristics of Nigerian economic growth process and trajectory. These are basic reflections and contradictions in a capitalist development models. But to achieve autonomous capitalist development in Nigerian agricultural production, basic ingredients of neo-classical development theories and its application to unimodal or bi-modal strategy in Nigerian agricultural sector would stimulate recovery from present economic recession and increase agricultural Gross Domestic Product (GDP).

W.W Rostow model of stage theory is linear and schematized. It is not realistic for every country of the world to follow this historical perspective since it is not possible for every economy to follow the same course of development having common past and the same future. The peculiarities of agricultural development in developing countries (LDCS) are different from developed economies.

Equally Arthur Lewis, concept of surplus labour in the rural economy with marginal productivity of labour being zero could not be applicable to economic development process in LDCS. It is believed that majority of labor in developing countries (in terms of surplus labor) are in the traditional sector with marginal product of labour ($MPL > 0$). The abundant land resources with increased fertility are in the rural economies, could lead to increased agricultural production as additional unit of labour and other variables inputs are being added to the untapped land resources for agricultural production (*Ceteris paribus*) In addition to this, the level of advancement in technology and usage of improved modern and scientific techniques in agriculture make the concept of surplus labour with marginal product of labour being zero unacceptable model for development in developing countries' agriculture.

To construct agricultural development model for Nigerian agriculture, Harrod-Domar model of higher saving ratio and a higher capital formation through mass investment would stimulate Nigerian agriculture. Saving and investment of neo-classical perspective and Harrod-Domar theory of growth if adopted would lead to a developed financial system (i.e. money and capital markets). The developed financial markets would propel investment in infrastructure, skilled and educated labour force, efficient and value oriented government institutions, efficiency in service delivery, commodity development, research and development in agricultural inputs and efficient value chain system in the sector (i.e. agriculture).

The adoption of unimodal or bi-modal strategy in Nigerian agriculture could be fashioned and tailored towards three basic variables of Harrod-Domar, Solow growth model and neo-classical counter revolution market and capital fundamentalism. Harrod-Domar emphasized saving and investment ratio while Solow developed this further by highlighting that capital accumulation, labour force growth (human capital development) and technology constitute basic parameters to stimulate output and growth in the real sector x

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such as agriculture. This is analogous to the principle of accelerator in which output and net induced investment arising from net saving in the real sector could lead to sustainable growth. This form the basis of market and capital fundamentalism of the neo-classical counter revolution. Nigerian agriculture requires these three input variables both from government and private investors and initiatives to develop the sector. This would guarantee long run economic growth.

The sector could adopt these three components or variables of growth (i.e. capital accumulation, Labour force growth or human capital development and technology [i.e. technical progress]) which could be expressed as follows both at t and $t + 1$ period with respect to output (Y) at both periods (i.e. previous and current periods).

Assuming capital accumulation (k) = k_tequation (1)

Labour force (l) = l_t equation (2)

Technology (A) = A_t equation (3)

Capital accumulation, Labour force and technology at t time will be k_t , l_t and A_t with respect to output (Y_t)

Changes in the level of these variables that would lead to sustainable changes in the level of output growth in the long run can be represented as

$Y_{t+1} - Y_t = \Delta Y$ equation (4)

$k_{t+1} - k_t = \Delta k$ equation (5)

$l_{t+1} - l_t = \Delta l$equation (6)

$A_{t+1} - A_t = \Delta A$ equation (7)

Therefore:

$$\Delta Y = \frac{\partial y}{\partial k} + \frac{\partial y}{\partial l} + \frac{\partial y}{\partial A} \dots\dots\dots \text{equation (8)}$$

We can decompose output (Y_t) in the sector (i.e. agricultural sector GDP) growth into portions that can be attributed to changes or growth in capital accumulation stock, the labour force and the level of technology. Taking equations 1 - 7 into consideration, we can divide both sides of equation 8 by (Y_t) there by having:

$$\frac{\Delta Y_t}{Y_t} = \frac{\partial Y}{\partial K} \frac{\Delta K_t}{Y_t} + \frac{\partial Y}{\partial L} \frac{\Delta L_t}{Y_t} + \frac{\partial Y}{\partial A} \frac{\Delta A_t}{Y_t} \dots\dots\dots \text{equation (9)}$$

It means that sustainable change or increase in the level of output in the sector can only be achieved by increase or change in the level of capital stock, increased training in human capital development (labour force) and technological progress both in the two periods.

With the increase or change in aggregate output in the sector would induce a change in the demand for capital goods (stock of capital investment) expand level of technology and human capital (i.e. labour force) development thereby improving value chain in the sector. Since accelerator ratio measures relationship between net investment of capital stock and change in the level of output; it beholds that net investment will take place in the economy only when aggregate output is increasing or increases. This matched the principle of accelerator with investment multiplier.

Assuming the three (3) variables are built into investment expenditures (capital, Labour force and technology) by governments and private sectors to stimulate growth in Nigerian agriculture, then we would have the following.

At 't' period the total investment expenditures (I_t) require to produce a given level of output in agriculture is:

$$I_t = \beta Y_t \dots \dots \dots \text{equation (1)}$$

Where

I_t = the level of Investment expenditures (on capital stock, labour force and technology) in 't' period in the sector.

Y_t = the level of aggregate output in the sector in the 't' period.

β = Accelerator co-efficient representing investment-output ratio. It shows the average amount of investment expenditures require to produce a unit level of output in the sector.

Assuming β is constant, and then any change in output will acquire a proportional change in investment expenditures (I). This will constitute a constant return to scale in terms of level of output in the sector making the sector to maintain a sustainable growth.

On the other hand, assuming that new or current periods output in the sector is given as (Y_{t+1}) the required investment expenditures in the current or new period will be:

$$I_{t+1} = \beta Y_{t+1} \dots \dots \dots \text{equation (2)}$$

Working in terms of changes to reflect the movement between period 't' and period $t + 1$, we subtract the equation (1) from equation (2) to obtain equation (3)

$$I_{t+1} - I_t = \beta Y_{t+1} - \beta Y_t \dots \dots \dots \text{equation (3)}$$

Factorize on R. H. S equation to obtain equation (4)

$$I_{t+1} - I_t = \beta (Y_{t+1} - Y_t)$$

Let $\Delta I = I_{t+1} - I_t$ and $\Delta Y = Y_{t+1} - Y_t$

Substitute ΔI for $I_{t+1} - I_t$ and ΔY for $Y_{t+1} - Y_t$ Then

$$\Delta I = \beta (\Delta Y) \dots \dots \dots \text{equation (5)}$$

$$\Delta I = \beta \Delta Y \dots \dots \dots \text{equation (6)}$$

Hence changes in investment expenditures in the sector between the two periods equal to the net investment expenditures in the sector.

If Net Investment Expenditures (NIEs) is substituted for ΔI (i.e change in investment expenditures) then we obtain equation (7)

$$NIE_s = \beta(\Delta Y) \dots\dots\dots\text{equation (7)}$$

Above shows that net investment expenditures of public and private initiatives in the sector depends or is a function of changes in the aggregate output (ΔY) in the sector. This represents total change in agricultural value chain in the economy.

Hence,

NIE_s = Is the net investment expenditures in the agricultural sector.

ΔY = Change in the level of output (Net change) and the value chain in the sector.

B = the accelerator co-efficient which measure the rate of change in investment expenditures with respect to change in the level of aggregate output.

The above model illustrates how sustainable growth and increase in output could be achieved, if there is partnership between public and private investment expenditures in Nigerian agriculture. These investment expenditures include capital stock accumulation, efficient and skilled labour force and technological progress which are necessary ingredients for growth in the sector. The overall multiplier effect would lead to increase in output, wealth, employment and income in the sector for the citizens.

Conclusion and Recommendation

The prospects for growth and sustainable development in Nigerian agriculture are bright, if government adopts pragmatic steps to stem the inadequacies in the sector. This paper analyzed various models of growth and strategies for agricultural development. To improve production and ensure food security for the nation Nigerian agriculture has the capacity to adopt these growth models and strategies particularly the classical and neo-classical theory of harrod-Domar and Solow which emphasized the importance of savings, investments, capital accumulation and technological progress in development. The application of these models, if blended with counter revolution doctrine of market fundamentalism (i.e market oriented economy) could promote autonomous capitalist development in Nigerian agriculture.

The paper holds the views that heavy capital formation through government and private sectors spending would stimulate agricultural sector out of present recession. In other words, there must be public-private partnership in agricultural production. This could be achieved through increased domestic savings, investment expenditures and human capital development in the economy. Above all, creating a friendly business environment which is more competitive and all- inclusive with sound legal or legislative frame work would induce foreign and local investments in agricultural production.

Since Nigerian agriculture is an admixture of subsistence production and modern farming system, the paper believes that application of uni-modal and bi-modal strategy of agricultural development would be appropriate option for Nigerian agriculture, out of recession. The uni modal strategy takes care of Peasant farmers in the traditional setting while the bi-modal takes care of large mechanized commercial farms since the country is blessed with abundant land resources. This is because the bi-modal strategy emphasizes a

synchronized development of both agricultural sector and industrial sector at the same pace due to backward and forward integration between the two sectors. This leads to increase commercialization of agricultural production thereby creating room for exports, foreign exchange earnings, employment, wealth and income distribution there by reducing poverty.

However, the adoption of Unimodal strategy along the line bi-modal will increase domestic food production by peasant farmers and demand as well as nutritional requirement of the citizens due to its complementing projects or inputs such as integrated rural development programmes which reduce poverty and income inequality in the rural economy.

The application of both bi-modal and uni-modal of agriculture would require government to deepen reforms in the sector particularly in the areas of human capital, institution technology, land distribution, social services, infrastructural development, agricultural value chain system and competition with regards to quality of produce. This will check skewedness and inequality in income and wealth as well as output- capital ratio which is likely to be created by bi-modal strategy.

Recommendations

Having analyzed model of growth in this work, it is imperative to offer necessary recommendations based on the study.

1. To drive agricultural sector out of the present economic quagmire the government and its officials should stop paying lip service to development of the sector. A more proactive and pragmatic approach in decision making and service delivery must be channeled into the sector so as to ensure increased production, food security and zero hunger environment for the citizens.
2. Agricultural value chain system must be strengthening through increased government spending and investments expenditures in the sector. Fiscal incentives and special agricultural credit that will promote food production and efficiency in resources allocation must be sustained.
3. The sector must be opened to foreign investments technological inputs and mechanization. Government must ensure that efficient institutional frame work is put in place to ascertain success of every development programs shoveled into agricultural sector.
4. Both public and private partnership should be encouraged in agricultural production. Government must look inward with regards to product development and value chain in agricultural production as the case in Brazil (an oil exporting country). Brazil discovered that ethyl alcohol (i.e ethanol) which comes from molasses (a byproduct of sugar cane) could be mixed with petroleum derivatives to produce a brand of fuel known as gasohol and alcogas or green petrol for motor vehicle (Ogen, 2007).

5. National savings and investment must be sustained in the sector by both public and private initiatives and expanded to support increased domestic production of food and for exports. Agricultural fund schemes and intervention must be established to take care of basic constraints facing agricultural production. Disbursement and utilization of such funds must be monitored and ensure it is applied in agriculture and not non-production ventures.
6. Agricultural Research institutes must be strengthened through provision of research funds, experts, skilled and well-trained personnel or researchers. These researchers would enhance increased output and yield in agricultural production through continuous research in agricultural inputs such as farm machines, equipment, seedlings, weeds control, soil nutrients and other inputs which are hall mark of agricultural modernization.
7. Both Uni-modal and bi-modal strategy of agricultural development must be adopted side by side in Nigerian agriculture. The Uni-modal strategy favours small scale farm holdings with complementary programs such as integrated rural development that promote regular farm production, consistent farmers' income, price stability, and consistent access to farm inputs and stem the rural-urban migration. Small scale farm holdings that capture rural peasant farmers have been successful in countries such as Indonesia, China and Mexico with uni-modal strategy.

On the other hand bi-modal strategy that captures large scale producers or farmers leads to commercial farming with heavy mechanization. This promotes linkage effect between agriculture and industry thereby leading to promotion of import substitution agro-allied industries. Nigeria historically being a net importer of food items and agriculture inputs in recent times spends enormous resources on food imports. Adoption of the bi-modal strategy would invariably reduce food and agricultural inputs importation and increase food exports. This will lead to increased foreign reserves for the country.

8. Nigeria oil revenue and wealth should be used and channelled judiciously to build infrastructures in agricultural sector, support credit and fund intervention schemes, build irrigation system and to cut down costs of production in the sector through subsidies. The oil wealth and revenue should be resources 'benefit' not resources 'curse' to the sector.
9. Finally, appropriate growth model and strategy based on market oriented initiatives and fundamentalism must be adopted as this would lead to market and price efficiency in agricultural production and increased wealth and income for the citizens.

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