SUSTAINABLE AGRICULTURAL INVESTMENT AND EMPLOYMENT GENERATION IN NIGERIA: THE ROLE OF INSTITUTIONAL FRAMEWORK

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Abstract

Nigeria is known to be the largest economy in Africa which is gifted with abundance of natural and mineral resources. These numerous resources notwithstanding, in the midst of plenty, the citizens suffer from poverty and malnutrition. The major problem is that the peasant farmers do not have the wherewithal to transmute their peasant farms into successful agribusinesses. Given the above background, this study utilised regression analysis to estimate the indicators of selected variables such as: political rights and civil liberty for institutional framework; agricultural investment (recurrent and capital), foreign direct investment on agriculture, gross fixed capital formation, agricultural labour force and real gross domestic product using data sourced from World Development Indicators and Freedom House (1981-2014).The study reveals that more than 85% of land in Nigeria is arable, but not up to 40% of the arable land is cultivated. Therefore, the study recommends restructuring of the agricultural sector through investment which will help generate employment. Furthermore, it is recommended that the institutional framework should be strengthened to boost the performance of the agricultural sector.

Keywords: Sustainable Agriculture, Investment; Employment; Institutional Framework

Introduction

In Nigeria, the agricultural sector is the major source of employment. Apart from providing food to feed her teaming population, agriculture can help to ameliorate poverty and enhance the standard of living of her citizens. However, this requires improvement of the assets of the rural farmers by making smallholder farming more competitive and sustainable. Household assets are the main determinants of the ability to participate in agricultural markets, secure livelihoods in subsistence farming, compete as entrepreneurs in the rural nonfarm economy and find employment in skilled occupations. These are geared towards improving the agricultural production, efficiency, and sustainability of small-scale farming as a pro-poor growth using agriculture for the attainment of food security (World Bank, 2008; Osabohien, Osabuohien & Urhie, 2017).

From 1980 to 2004, agriculture gross domestic products (GDP) globally increased by an average of 2.0% a year, more than the population growth of 1.6 % a year. This growth, driven by increasing productivity, decreased the real price of grains in the world market by

about 1.8% a year over the same period. Developing countries achieved much faster agricultural growth (2.6% a year) than industrial countries (0.9% a year) in 1980-2014. Developing countries accounted for an impressive 79% of overall agricultural growth during this period (World Bank, 2008; 2015). The global proportion of agriculture GDP increased approximately from54% in 1980 to 65% in 2004. On the contrary, they accounted for less than 21% of non-agricultural GDP in 2004 (Omorogiuwa, Zivkovic & Ademoh, 2014).

Nigeria is endowed with mineral and natural resources, fertile soil for agricultural purposes and has the capacity of becoming the largest economy in the continent of Africa and become a key player in the world's economy if her agricultural potentials are fully utilized in the quest for sustainable development (Adesiyan, Hakim & Basri, 2015). Many activities are involved in the agricultural sector which combines labour, land or soil, and livestock, among others (Jerzy, 2012). Majority of the populace (about 70% of the population) live in rural areas and rely solely on farming as a means of their livelihood. In Nigeria, the agricultural sector contributes to about 55% of gainful employment and almost 40% of the share of GDP before the era of oil boom of 1970s. However, the current share of agriculture GDP ratio is fairly high compared to the average of 27% for low income nations in Sub-Sahara Africa (World Bank, 2010).

Literature Review and Background Facts

Nigeria, which was known to be an agriculture dependent country, shifted her attention from agriculture to petroleum in the 1970s (oil boom era) and thereafter, experienced a low growth rate of her economy. This calls for reinvigorating the agricultural sector through investment. Agriculture contributes up to 40% of the country's GDP and contributes more than 75% to the labour to the economy (Central Intelligence Agency-CIA, 2012). In rural areas, agriculture holds the potential for the rural dwellers and cuts across all phases of the economy of the rural areas where approximately 55% of the populace live but which lack the required resources to transform their small farms into thriving agriculture business (Aluko, 2004; Otaha, 2012).

The abundance of natural resources notwithstanding, the Nigerian economy has over time performed below average. With over 180 million people and labour force of over 150 million, its production is not commensurate with the population growth and this hinders food security (CIA, 2012). Sanusi (2010) and Chauvin, *et al*, (2012) report that arable land of over 30 million hectares is cultivated and the country's favourable weather and climate enhances the production of various agricultural commodities. Irrespective of these numerous resources, Nigeria is known to be among the poor countries of the world (Aluko, 2004). Sekunmade (2009) observed that Nigeria imports more food than any other country in Africa due to her inability to produce enough food to cater for her teaming population, though the sector provides more than two-thirds of jobs, thus contributing significantly to the country's GDP. Federal Ministry of Agriculture and Rural Development (FMARD, 2012), noted that the agricultural sector has untapped potentials, and the youth need to be

incorporated in harnessing these resources. Similarly, Lipton (2012) reported that Nigeria has a good irrigation system with surface and underground water of about 267.7 BCMs (billion cubic meters) and 57.9BCMs to enable her produce enough even in dry seasons.

Falola and Heaton (2008) noted that in 1960, the oil sector contributed only 0.6% to GDP while agriculture's contribution stood at 67%. By 1974, the proportion of oil increased to 45.5% almost doubling that of agriculture which had decreased to 23.4% (Christiaensen & Demery, 2007; Yakub, 2008). In 2012, commodity importation was valued at $1billion (Nzeka, 2013). This is majorly as a result of decrease in production of agricultural commodities, and the proportionate share of agricultural output in total exports (Olajide, *et al*, 2012).

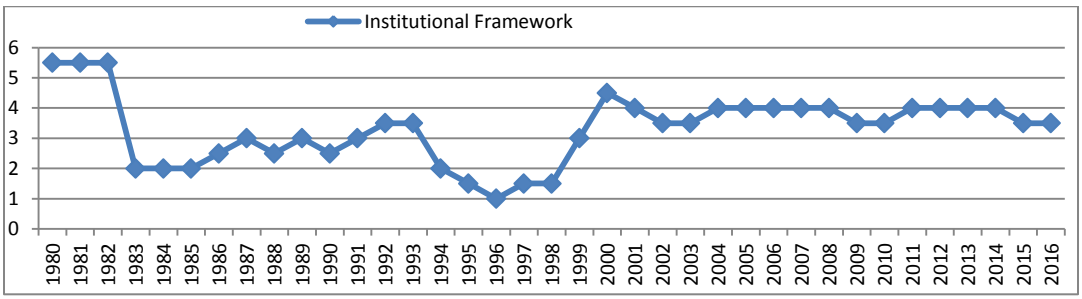

Figure 2.1 Nigeria's Institutional Framework (1980-2016)
Source: Authors' Computation using Freedom House (2016)

Figure 2.1 shows that the level of Nigeria's institutional framework (that, the average of political rights and civil liberty) witnessed some undulating trend. From 1980 to 1981, Nigeria was regarded as institutionally free but became less free afterwards. Given the recent empirical observations that most activities by economic agents can be predicted upon the nature of the institutional framework operating in such system (Osabuohien & Efobi, 2013), a weak institutional framework can hinder the agricultural sector's performance through inadequate materials and facilities such as modern tools, roads, among others (IFAD & World Bank, 2012). For instance, it was noted in Ethiopia that the availability of basic amenities especially feeder roads can increase the returns of the farmers by 12 to 15% (Stife *et al*, 2016; Osabuohien, Okorie & Osabohien, 2016).

Furthermore, a strong institutional framework is needed to coordinate agricultural research and development. This is motivated by various kinds of economic advantages that the agriculture is made up of, which include: employment opportunities, food security, control of rural-urban migration, among others (World Bank Report, 2008; Osabuohien & Efobi, 2013). Investment in agriculture (capital and recurrent) is necessary to take Nigeria's agriculture to the promised land.

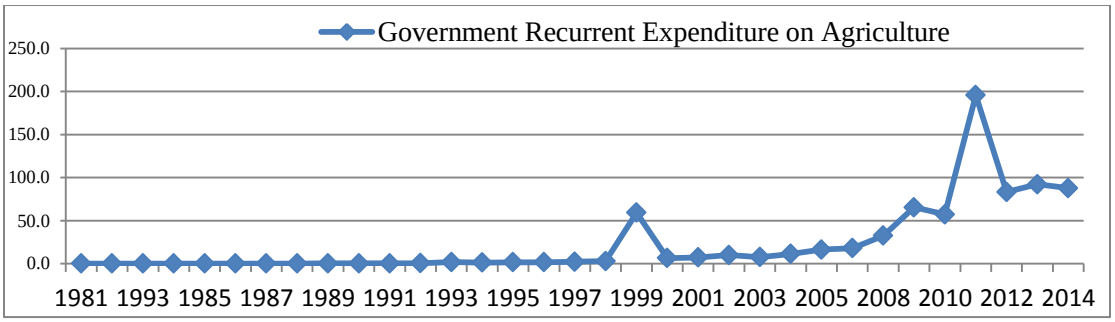

Figure 2.2: Recurrent Expenditure on Agriculture (1981-2014)
Source: Authors' computation using data from WDI, 2016

As Figure 2.2 shows, from 1981 to 1987 there was very low recurrent expenditure on agriculture and from 1988 to 2010 less than 3% of government expenditure went into agriculture. Investment in the agriculture sector for the development agenda requires better governance and donor coordination (World Bank, 2008).

Theoretical Framework and Method of Analysis

This study draws from the Solow growth model, which assumes growth to be a function of investment. Investment in labour and capital will invariably boost agricultural productivity. Capital investment could be in form of agricultural machineries like tractors, and labour investment could be in form of training agriculture personnel. The Solow model assumes that growth is positive at all time, but slowly declines to zero if not sustained (Gallup *et al*., 1997; Thirtle, Lin & Piesse, 2003; Osabohien, Osabuohien & Urhie, 2017). The Solow growth model was infused in this study as the gross fixed capital formation and agricultural labour force which measures machineries and productivity of labour as asserted by the model. Owning to that effect and relating to the economy in which the focus of this study is motivated, countries like Nigeria that have a high rate of population growth can hardly take-off. Studies on the effect of institutional framework on agriculture have be conducted, for example, on rice production and processing in Ogun State, Nigeria, specifically on the relevance of the indigenous institutional arrangement. Investment and employment generation have focused on light of "institutional framework" in the light of policy like national agriculture policy, investment policy, among others (Osabuohien, Okorie & Osabohien, 2017). A country's institutional framework can aid or hamper the quest for sustainable development. However, the model predicts that higher population growth rates, lower savings and low investment rates are associated with lower growth levels, lower employment and low standards of living (Awokuse, 2008*;* Irz *et al*., 2001)

Investment can be seen as a means of augmenting capital stock (Arene and Okpukpara, 2006). Following Ogbanje *et al* (2010), this study recognises that lack of investment as the main component of the vicious circle of poverty. This is as a result of its adverse effect on productive capacity. In developing countries, national income is low; thus, savings and

investment are also low. Low investment translates to low capital stock, low productivity and low output as well as low income. In line with Keynesian economics, investment means addition of capital which helps to boost production and increase the income base of agriculturalists. Thus, real investment includes new plant and equipment, construction of public works like dams, road, building, net foreign investment, inventories, and stocks and shares in new companies (Jhingan, 2003).

Model Specification

Taking into consideration the theoretical framework, this model was used to examine how the institutional framework can lead to the improvement of the agricultural sector in Nigeria. The model specifies that sustainable development (proxied by real gross domestic product) is significantly influenced by the following indicators: gross fixed capital formation, labour force, government recurrent expenditure on agriculture, foreign direct investment and institutional framework.

The model is specified implicitly as follows:
$rgdp = f(gfcf, lab, ger, fdi, insf)$ …… *(1)*

Where:
rgdp: real gross domestic products; this was measured by the GDP at factor cost
gfcf: gross fixed capital formation. This is measured by the accumulation of capital asset
lab: labour force; Labour force represent the employment rate in agriculture with respect to total employment
ger: government recurrent expenditure on agriculture. The represent the amount of money in naira invested recurrently on agricultural sector.
fdi: foreign direct investment measured by the total value of the foreign investment in naira equivalent in Nigeria
insf: institutional framework as measured by political rights and civil liberty.

In order to carry out the various estimation tests the model was transformed to a double log format which is represented as:

$$lnrgdp = \beta_0 + \beta_1 lngfcf + \beta_2 lnlab + \beta_3 lnger + \beta_4 lnfdi + \beta_5 lnins + \mu_t \quad (3)$$

Where:
lnrgdp: logarithm transformation of real gross domestic products,
lngfcf: logarithm transformation of gross fixed capital formation,
lnlab: logarithm transformation of labour force,
lnger: logarithm transformation of government recurrent expenditure on agriculture,
lnfdi: logarithm transformation of foreign direct investment, and
lnins: logarithm transformation of institutional framework

μ_t *: the error term which captures other exogenous variables that are not specified in the model.* The reason for the use of log is to reduce the incidence of multicollinearity.

The variables chosen for this study were considered to be relevant as they are key indicators for the development of the agricultural sector in order to generate employment and are sourced from World Development Indicators, Central Bank of Nigeria (CBN) Statistical Bulletin and Freedom House from 1981 to 2014.

The a priori expectation of the variables is that a positive relationship exists between the dependent variable and the independent variables in the model. In order to confirm (or otherwise) the a priori expectation, the estimation techniques STATA software used include: Augmented Dickey-Fuller (ADF) unit root test, Johansen Co-integration test and the Johansen normalized restriction imposed test.

Empirical Analysis and Results

Unit Root Test Using Dickey Fuller and Augmented Dickey Fuller Test

The Dickey Fuller test and the Augmented Dickey Fuller test were conducted for all the time series employed in this study. This analysis is required in order to avoid the case of obtaining "spurious" results. A variable is considered to be stationary when the absolute value of ADF t-stat is greater than the absolute critical value at 5% and non-stationary when the ADF t-stat is less than the critical value as depicted in Table 4.1 which shows that all the variables were non-stationary at levels. In order to achieve stationary variables, the Augmented Dickey Fuller test was carried out by differencing the variables as shown below:

Table 4.1 Unit Root Test Using Dickey Fuller and Augmented Dickey Fuller Test

Variables	Lag length	DF t-stat	0.05 Critical value	Order of integration	Remarks
Lnrgdp	0	1.725	-2.980	*I*(0)	Non-stationary
Lngfcf	0	-1.162	-2.980	*I*(0)	Non-stationary
Lnlab	0	-0.543	-2.980	*I*(0)	Non-stationary
lnger	0	-1.322	-2.980	*I*(0)	Non-stationary
Lnfdi	0	-1.366	-2.980	*I*(0)	Non-stationary
Lnins	0	-2.424	-2.980	*I*(0)	Non-stationary

Source: Authors' Compilation from STATA 10

Augmented Dickey Fuller Test

Table 4.2 Stationary Tests after First Difference

Variables	Lag length	DF t-stat	0.05 Critical value	Order of integration	Remarks
Lnrgdp	0	-4.188	-2.983	*I*(1)	Stationary
Lngfcf	0	-4.349	-2.983	*I*(1)	Stationary
Lnlab	0	-6.022	-2.986	*I*(1)	Stationary

lnger	0	-7.962	-2.983	*I*(1)	Stationary
Lnfdi	0	-11.086	-2.983	*I*(1)	Stationary
Lnins	0	-4.829	-2.983	*I*(1)	Stationary

Source: Authors' Compilation using STATA 10

As earlier mentioned, a variable is stationary when the absolute value of ADF t-stat is greater than its absolute critical value. From Table 4.2 above, all the variables are stationary after first difference. So what?

Co-integration Test

Table 4.3 Test for Co-integration among Series

Maximum Value	Eigen value	Trace Statistic	0.05 Critical value
None	-	144.6253	94.15
At most 1	0.83666	88.4552	68.52
At most 2	0.68486	52.6579	47.21
At most 3*	0.65155	19.9760	29.68
At most 4	0.31428	8.2801	15.41
At most 5	0.20953	0.9910	3.76
At most 6	0.03146	-	-

Source: Authors' Compilation using STATA 10

The Johansen cointegration test as shown in Table 4.3 indicates whether a long run relationship exists among the variables under study. This is empirically determined at the point where the trace statistics is less than the 5% critical value. The result shows that there are three co-integrating equations with the trace statistics at 19.976 and 29.68 critical value at 5%. This shows the indication of a long run relationship among the variables. In order to determine the kind of relationship that exists between the exogenous variables and the dependent variable (RGDP). The Johansen Normalised Restriction Imposed estimation was carried out. The result is shown in Table 4.4

Table 4.4 Johansen Normalised Restriction Imposed

Normalised Co-integrating Coefficient						
Log likelihood = 32.79447						
Variables	**LNRGDP**	**LNGFCF**	**LNLAB**	**LNGER**	**LNFDI**	**LNINS**
Co-efficient	1.0000000	-0.188324	-30.06839	0.3052383	-0.8054554	-0.461425
Standard error	-	0.1068166	5.649648	0.04651	0.0986652	0.0824965
Z test	-	-1.76	-5.32	6.56	-8.16	-5.59
P > /Z/	-	0.078	0.000	0.000	0.000	0.000

Source: Authors' compilation using STATA 10

The results from the Johansen cointegration test are displayed above in Table 4.4. The results indicate that all the variables are highly statistically significant at 5% with the exemption of gross fixed capital formation. It is important to note that as a result of the normalisation, the coefficient signs are explained in the reverse**.** That is, wherever there is a positive sign (+) it indicates an inverse/negative relationship and wherever there is a negative sign (-) it indicates a direct/positive relationship.

Gross fixed capital formation (GFCF) has a positive relationship with real gross domestic product (RGDP) which satisfies the a priori expectation. The coefficient value indicated as 0.188324 is less than one indicating an inelastic relationship exists between the variables. This implies that in the long run, gross fixed capital formation has a positive impact on real gross domestic product such that a percentage increase in gross fixed capital formation will lead to approximately an 18% increase in real gross domestic product. However, gross fixed capital formation (GFCF) has a probability value of 0.078 which shows that it is not significant at 5% level and thus, the result is considered not reliable.

Labour force (LAB) has a positive relationship with real gross domestic product (RGDP). This indicates that in the long run, the rate of increase in the labour force generates a positive impact on real gross domestic product. This is in line with the a priori expectations. The coefficient value is represented as 30.06839 is greater than one, showing that an elastic relationship exists between the variables. Therefore, a percentage increase in labour force will bring about an increase in real gross domestic product. The probability value of 0.000 indicates that it is highly statistically significant at 5% level

Government recurrent expenditure on agriculture (GER) has a negative relationship with real gross domestic product (RGDP). This indicates that in the long run, the rate of increase in government recurrent expenditure on agriculture generates a negative impact on real gross domestic product. This is contrary with the a priori expectations. The coefficient value is represented as 0.3052383 which is less than one showing that an inelastic relationship exists between the variables.

Foreign direct investment (FDI) has a positive relationship with real gross domestic product (RGDP) which is in line with the a priori expectation. The coefficient value of the variable at 0.8054554 is less than one indicating an inelastic relationship. A percentage increase in foreign direct investment will bring about approximately an 80.5% increase in real gross domestic product.

Institutional framework (INS) analysis showed that it has a positive relationship with real gross domestic product (RGDP) which is in line with the a priori expectation. The coefficient value of this variable is 0.461425 which is less than one and as such indicates an inelastic relationship between the variables. It also implies that in the long run, a percentage increase in institutional framework will bring about a 46.1% increase in real gross domestic products.

Summary and Conclusion

The findings of this study show that there exists a long run relationship between gross fixed capital formation and real gross domestic product, agricultural labour force and real gross domestic product, foreign direct investment and real gross domestic product, institutional

frame work and real gross domestic product, government expenditure and real gross domestic product. Labour force, foreign direct investment and institutional framework all indicated a positive and significant relationship with real gross domestic product. This implies that an increase in the labour force which is the working population has a significant impact on the development of Nigeria. An improvement in the institutional framework will also help to create an environment for the farmers and individuals involved in the agricultural sector to prosper as better institutional practices are in place to protect farmers and workers from exploitation and covariant shocks (risks) associated with agricultural sector.

The gross fixed capital formation indicated a positive, but insignificant relationship with real gross domestic product. This information reveals that an improvement in the level of investment on fixed assets by the government such as availability of infrastructures needed to boost development may not lead to a significant growth. However, the positive relationship suggests that it still plays a key role which cannot be neglected by the government as proper infrastructures like electricity and good and accessible roads, good markets etc. are highly important. The government recurrent expenditure on agriculture shows that there is a negative and significant relationship. The findings can be validated as a result of the weak institutional facilities in order to ensure that the investment is properly executed and not diverted for other purposes. According to World Bank (2008), investment in the agriculture sector for the development agenda requires better governance and donor coordination.

The major finding of this work shows that institutional framework, that is, the levels of freedom in the country have positive and significant impact on the development of the Nigerian economy within the period under study. The comprehensive state of freedom of a country is so vital in the Nigeria's agricultural sector for employment generation, growth and sustainable development.
It is therefore recommended that concerted efforts should be made in agriculture by both the federal government of Nigeria and other key agencies, formulating and executing policies that will lead to the improvement of the level of freedom and institutional framework that will boost the economy of the nation and generate employment.

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