

Human Capital Development, National Security and Agricultural Sector Growth in Nigeria (1980-2017)

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ABSTRACT

This work sets-out to explore the relationship between human capital and security indices and agricultural sector growth in Nigeria- Time series data spanning from 1980-2017 were used. The study employed Autoregressive Distributed Lag (ARDL) co-integration analysis to estimate the relationship among the variables used in the study. The study revealed that government expenditure on health, government expenditure on security and primary school enrollment all have a positive non-significant short-run and long-run relationship with agricultural sector growth in Nigeria. The result further shows that government expenditure on education; secondary school enrollment and tertiary institutions enrolment all have negative and insignificant relationship with agricultural sector growth in Nigeria. The study also revealed that life expectancy has a positive significant relationship with agricultural sector growth in Nigeria during the period under study. Based on the outcome of the study it is recommended that government should strengthen the health system, improve economic wellbeing of citizens and provide adequate security for lives to ensure higher life expectancy. It further recommends adequate funding of basic education and changing the national security architecture to be focus more on intelligence gathering and detection of early warning signals.

Keywords: Human, Capital Development, National Security and Agricultural.

INTRODUCTION

One of Nigeria's major policy objectives has been to attain stability, material prosperity, peace and social progress [1,2,3,4,5]. However, this has been hampered as a result of internal problems. These include inadequate human development, primitive industrial and agricultural production practices, poor infrastructure, insecurity, corruption and mismanagement of resources. In order to ensure the economy delivers its potentials, the country experimented with two development philosophies viz a private sector led growth and a public sector-driven growth [6,7,8,9]. In time past, efforts concentrated on accumulating physical capital to the detriment of human capital in Nigeria's quest for rapid socio-economic development. However, earlier development plans which virtually ignored human aspects of development did little to increase the growth and development of the country [10]. In Nigeria and indeed other parts of the world, agriculture is one of the economic

sectors that play multiple roles. It is a major employer of labour, employing about 70 to 80 per cent of her population [11,12,13]. It is the major source of food for the population and feed for livestock. It is also a major source of raw materials for industries and further contributes to the GDP and balance of payments of the country [11]. Based on the importance of the agricultural sector, it is necessary to develop the mental capacity of the practitioners so as to increase the physical output of the sector. As the global economy shifts towards more knowledge based sectors, skills and human capital development becomes a central issue for policy makers and practitioners engaged in economic development both at national and regional level. Human capital development is associated with investment in man and his development as a creative and productive resource [12]. It is an important factor used in converting all resources to benefit mankind and includes education, health,

labour, employment and more. With increased human capital development, the agric sector in Nigeria is expected to witness growth provided there is adequate security in the country [13]. Insecurity has been identified as one of the obstacles to sustainable development [14]. Nigeria, in recent times, has witnessed an unprecedented level of insecurity resulting in the country consistently ranking low in the global peace index [15]. These security challenges include Boko-Haram crisis in the North eastern part of the country, which has led to loss of lives and displacement of persons, the farmers - herder's clashes in the North-central part

Research Questions

This research is guided by the following research questions

1. What is the relationship between human capital development and agricultural sector growths in Nigeria?

Objectives of the Study

The broad objective of this study is to examine the effects of human capital development and national security on agricultural sector growth in Nigeria. The specific objectives of this are as follows

1. To identify the components of human capital development that affects agricultural sector growth in Nigeria.

Hypothesis of the Study

1. There is no significant relationship between human capital development and agricultural sector growth in Nigeria.

Significance of the Study

This study will focus on the nexus between human capital development, national security and agricultural sector growth in Nigeria. While a number of researches have dwelt on the effect on the effect of human capital development on economic development, only few have tried assessing its specific impact on

of the country, etc. These security flashpoints are majorly farming communities and their agricultural production activities have been reduced to the barest minimum thereby posing a threat to food security and industrial production in Nigeria. In the absence of security (insecurity), economic growth and development cannot be sustained as it destroys economic, human and social capital. Under conditions of peace and security, people and government can direct their efforts and resources towards improving human life. Consequently, this paper sets out to forge a nexus between human capital development, security and agricultural sector growth in Nigeria.

2. What is the relationship between national security and agricultural sector growth in Nigeria?

3. Does a causality relationship exist between human capital development, national security and agricultural sector growth in Nigeria?

2. To examine how national security affects agricultural sector growth in Nigeria.

3. To establish if a causality relationship exist between human capital development, national security and agricultural sector growth in Nigeria

2. There is no significant relationship between national security and agricultural sector growth in Nigeria.

3. There is no causality relationship between human capital development, national security and agricultural sector growth in Nigeria.

agricultural sector which is a key aspect of the economy. Furthermore, only few studies have assessed the impact of security on economic development but none has specifically assessed its effect on agricultural sector growth. This thus establishes the significance of this study.

Scope and Limitations of the Study

This study seeks to establish the relationship between human capital development, national security and agricultural sector output in Nigeria. It will use secondary time series data for a

span of 38 years (1980-2017). This study was limited by non-availability or incomplete data on some necessary variables hence they were excluded from the study.

METHODOLOGY

Research Design

The ex-post factor design was adopted in this research in obtaining, analyzing and interpreting data relating to the objectives of this study. The choice of this design is to allow for observation of

the variables over a long period of time. In this study both the dependent and independent variables was observed over the period 1980-2017.

Method of Evaluation

Analysis of levels and trends in the selected variables was done to provide an insight into their pattern of movement overtime. An Augmented Dickey-Fuller (ADF) Unit root test was conducted to test the stationarity of the variables. Based on the order of stationarity, ARDL

the long-run form of the model was estimated. The short run form of the model was also estimated. Granger Causality test was conducted to check for the existence of causality relationship between agricultural sector growth and human capital development and between agricultural sector growth and national security. Diagnostic tests were conducted to test for properties and stability of the model.

Model was adopted. A bound test was conducted to test for co-integration. The result of the bound test showed the presence of long-run relationship hence

Data Required and Sources

Secondary time series data is used for this study. Data for real agric GDP, government expenditure on education, health and security was sourced from Central Bank of Nigeria statistical bulletins. The data for primary, secondary and tertiary institutions enrolment was

sourced from National Bureau of Statistics and the Nigeria Education Management Information System (NEMIS) publications while the data for life expectancy was obtained from the World Bank data base. The data is for period 1980-2017 (38 years)

Econometric Software for the Work

E-views 9.0 was used for the model estimation in this study.

PRESENTATION AND ANALYSIS OF RESULTS
 Table 1: Summary of Results of ADF Unit Root Test

At Levels			At 1 st difference		ORDER OF INTEGRATION
VARIABLE	ADF VALUE	5% CV	ADF VALUE	5% CV	
LOG(RAGDP)	-1.327891	-3.540328	-4.672673	-2.948408	1(1)
LOG(GEE)	-1.355975	-3.540328	-5.150211	-2.948404	1(1)
LOG(GEH)	-0.673532	-3.587527	-7.775770	-2.948404	1(1)
LOG(GES)	-1.609695	-3.536601	-3.811890	-2.945842	1(1)
LOG(LEX)	-4.984390	-3.536601	-	-	1(0)
LOG(PSE)	-3.680891	-3.548490	-	-	1(0)
LOG(SSE)	-1.791511	-3.574244	-4.430475	-2.981038	Id)
LOG(TIE)	-4.333870	-3.540328	-	-	1(0)

Source: Author Computation

From table 1 above, the logs of government expenditure on education(GEE), government expenditure on health (GEH), government expenditure on security (GES), secondary school enrolment(SSE) and real agric gross domestic product(RAGDP) are stationary at first difference while logs of life

expectancy (LEX), primary school enrolment (PSE) and tertiary institutions enrolment (TIE) are stationary at levels. The different orders of integration warrant the model will be estimated using the Autoregressive Distributed Lag (ARDL) model

Co-Integration Test

To determine if a long-run relationship exists among the variables, a bound test is conducted.

Table 2: ARDL Bounds test

ARDL Bounds Test

Date: 04/19/19 Time: 02:00

Sample: 19822016

Included observations: 31

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.400845	7
Critical Value Bounds		
Significance	10 Bound	11 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

The result of the bound test is shown in table 2 above. The rule is that if the computed F-statistic falls below the lower bound value I (0), the null hypothesis (no co-integration) will not be rejected. If the computed F-statistic, exceeds the upper bound value I (1), the null hypothesis is rejected, which indicates that there is co-

integration. If the computed result falls between the upper and lower bounds, the test is inconclusive. The results show that the F-statistic is 4.400, which is higher than the upper bound value at 5% (3.5). This means that this warrants the estimation of the long-run form of the model.

Regression Model
Long- Run ARDL Model

Table 3 ARDL Cointegrating And Long Run Form

Dependent Variable: LOG(RAGDP)
Selected Model: ARDL(1, 0, 0, 0, 1, 0, 0, 0)
Date: 04/18/19 Time: 02:04
Sample: 19802017
Included observations: 31

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(GEE)	-0.022823	0.030485	-0.748641	0.4624
DLOG(GEH)	0.031116	0.032530	0.956545	0.3497
DLOG(GES)	0.030023	0.021755	1.380040	0.1821
DLOG(LEX)	-0.334402	0.262946	-1.271753	0.2174
DLOG(PSE)	0.050914	0.050955	0.999194	0.3291
DLOG(SSE)	-0.034557	0.024156	-1.430576	0.1673
DLOG(TIE)	-0.015575	0.027524	-0.565870	0.5775
CointEq(-1)	-0.192111	0.048847	-3.932919	0.0008

$$\text{Cointeq} = \text{LOG(RAGDP)} - (-0.1188 \cdot \text{LOG(GEE)} + 0.1620 \cdot \text{LOG(GEH)} + 0.1563 \cdot \text{LOG(GES)} + 6.1626 \cdot \text{LOG(LEX)} + 0.2650 \cdot \text{LOG(PSE)} - 0.1799 \cdot \text{LOG(SSE)} - 0.0811 \cdot \text{LOG(TIE)} - 16.1318)$$

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GEE)	-0.118800	0.155699	-0.763008	0.4539
LOG(GEH)	0.161969	0.167331	0.967956	0.3441
LOG(GES)	0.156282	0.111989	1.395517	0.1774
LOG(LEX)	6.162553	1.881665	3.275053	0.0036
LOG(PSE)	0.265026	0.282973	0.936574	0.3596
LOG(SSE)	-0.179883	0.145102	-1.239703	0.2288
LOG(TIE)	-0.081074	0.153731	-0.527376	0.6035
C	-16.131835	9.326152	-1.729742	0.0983

Table 3 shows the long-run dynamic analysis. The results show that the error-correction coefficient which embodies the equilibrium relationship between variables is well behaved since it has the desired sign (-0.192111) and is also significant at 5% level (0.0008). This implies 19.2% of any disequilibrium in agric sector growth is corrected by the variables examined within one period (one year). The result further show a positive and significant (at 5%) long run relationship between life expectancy (LEX) and real agric gross domestic product (RAGDP). This conforms to a priori

expectation. The result also shows that the coefficient of logs of government expenditure on health (GEH), government expenditure on security (GES) and primary school enrolment (PSE) obeyed their expected signs. They are however statistically insignificant at the chosen 5% level. The coefficient of logs of government expenditure on education (GEE), secondary school enrolment (SSE), and tertiary institutions enrolment (TIE) have negative signs. This is against a priori expectations. They are also statistically insignificant.

Short-Run Model

Table 4: ARDL Short-Run Dynamic Analysis

Method: ARDL

Date: 04/18/19 Time: 01:59

Sample (adjusted): 1982 2016

Included observations: 31 after adjustments

Maximum dependent lags: 2 (Automatic selection)

Model selection method: Schwarz criterion (SIC)

Dynamic regressors (2 lags, automatic): LOG(GEE) LOG(GEH) LOG(GES)

LOG(LEX) LOG(PSE) LOG(SSE) LOG(TIE)

Fixed regressors: C

Number of models evaluated: 4374

Selected Model: ARDL(1, 0, 0, 0, 1, 0, 0, 0)

Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(RAGDP(-1))	0.807889	0.048847	16.53924	0.0000
LOG(GEE)	-0.022823	0.030485	-0.748641	0.4624
LOG(GEH)	0.031116	0.032530	0.956545	0.3497
LOG(GES)	0.030023	0.021755	1.380040	0.1821
LOG(LEX)	-0.334402	0.262946	-1.271753	0.2174
LOG(LEX(-1))	1.518294	0.324948	4.672424	0.0001
LOG(PSE)	0.050914	0.050955	0.999194	0.3291
LOG(SSE)	-0.034557	0.024156	-1.430576	0.1673
LOG(TIE)	-0.015575	0.027524	-0.565870	0.5775
C	-3.099096	1.768027	-1.752856	0.0942
R-squared	0.996893	Mean dependent var	8.687353	
Adjusted R-squared	0.995561	S.D. dependent var	0.668956	
S.E. of regression	0.044569	Akaike info criterion	-3.127880	
Sum squared resid	0.041713	Schwarz criterion	-2.665303	
Log likelihood	58.48214	Hannan-Quinn criter.	-2.977091	
F-statistic	748.6261	Durbin-Watson stat	1.823476	
Prob(F-statistic)	0.000000			

*

Note: p-values and any subsequent tests do not account for model selection.

Table 4 above shows the short run dynamics. It reveals a positive relationship between the logs of government expenditure on health (GEH), government expenditure on security (GES), one lag of life expectancy (LEX) log of primary school enrolment (PSE) and log of real agric gross domestic product

(RAGDP). A negative relationship however exists between the log of government expenditure on education (GEE), one lag period of Life expectancy (LEX), log of secondary school enrolment (SSE) and log of tertiary institutions enrolment (TIE). The results further show that only one lag period of life expectancy is statistically significant at 5% level of significance.

Granger Causality Test
Table 5 Granger Causality Test Results

Pairwise Granger Causality Tests

Date: 04/18/19

Time: 02:42

Sample: 19802017 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DLOG(GEE) does not Granger Cause DLOG(RAGDP) DLOG(RAGDP) does not Granger Cause DLOG(GEE)	34	0.20214 0.49009	0.8181 0.6176
DLOG(GEH) does not Granger Cause DLOG(RAGDP) DLOG(RAGDP) does not Granger Cause DLOG(GEH)	34	0.11427 1.11500	0.8924 0.3416
DLOG(GES) does not Granger Cause DLOG(RAGDP) DLOG(RAGDP) does not Granger Cause DLOG(GES)	34	0.82403 0.03067	0.4487 0.9698
DLOG(SSE) does not Granger Cause DLOG(RAGDP) DLOG(RAGDP) does not Granger Cause DLOG(SSE)	23	0.03551 0.20996	0.9652 0.8126

Table 5 show the results of granger causality test carried out to determine the causality relationship between human capital development, national security and agricultural sector growth in Nigeria. The results show that the probability

values are greater than the chosen 5% level of significance. This implies no causality relation between real agric GDP, human capital development and national security.

Post estimation test

Table 6: Results of Econometric Tests

	X ² Statistics	Probability
Ramsey Reset Test	3.039599	0.0966
Serial Correlation LM Test	1.476999	0.4778
Normality Test	0.625135	0.731566

Table 6 shows the results of the second order tests. The results show that the model does not suffer from problem of auto-correlation and normality of

residuals. The Ramsey Reset test further shows that the model is well specified. Thus the model is well behaved.

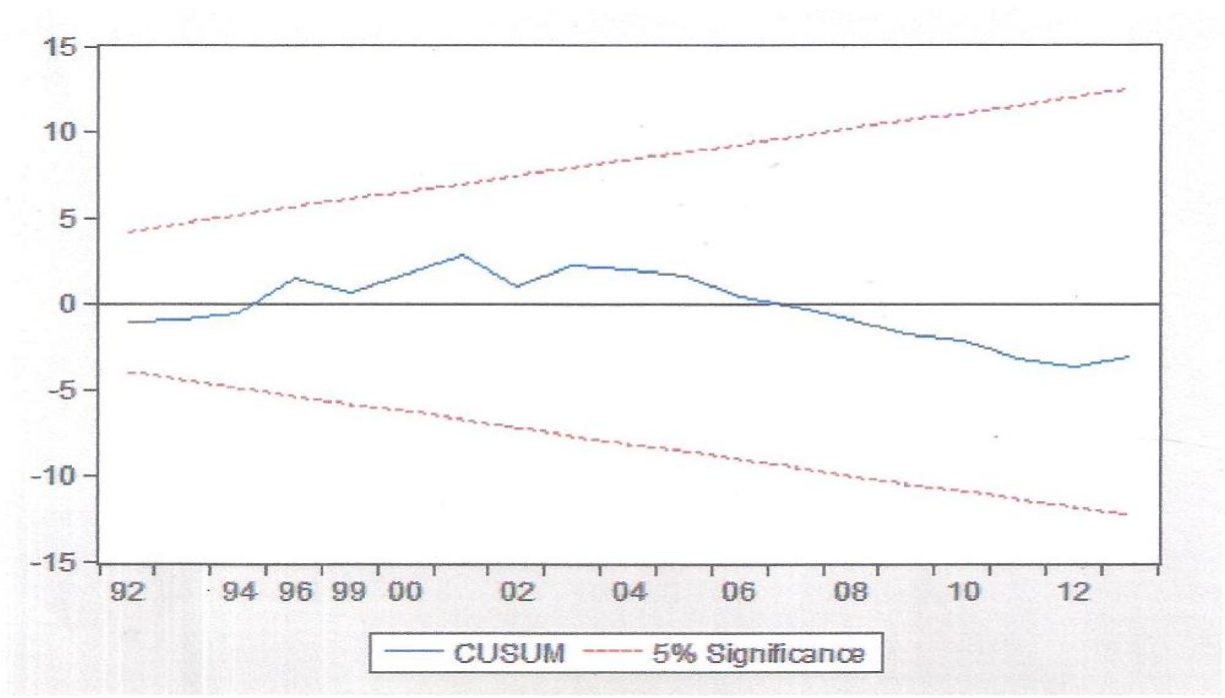
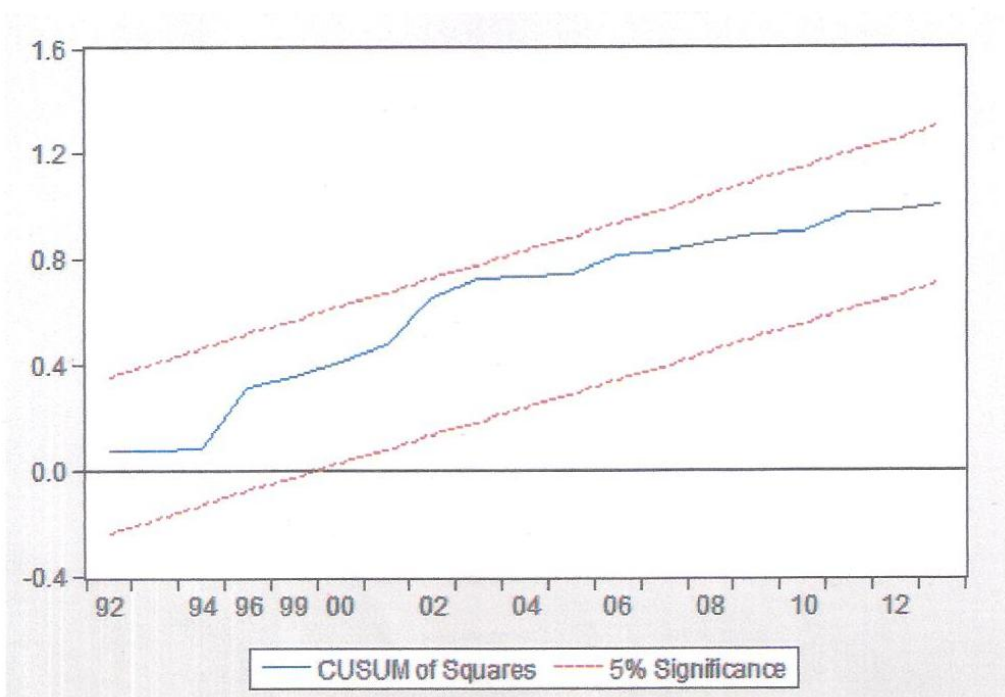


Figure 2: CUSUMSQ



The stability properties of the model were tested using the cumulative sum of residual (CUSUM) and the cumulative sum of residual square (CUSUMSQ) test. The existence of parameter instability is established if the CUSUM and CUSUMSQ go outside the area between the critical

(dotted) lines (red lines). It is estimated at 5% critical level. From the figures it can be inferred that for the period under study, stability is established, since CUSUM and CUSUMSQ did not go outside the critical lines.

Test of Hypothesis

This study sought to test the following hypotheses

1. There is no significant relationship between human capital development and agricultural sector growth in Nigeria.

2. There is no significant relationship between national security and agricultural sector growth in Nigeria.

period (one year). The result further show that government expenditure on health (GEH), government expenditure on security (GES), life expectancy (LEX), primary school enrollment (PSE) all have their expected signs. However, only life expectancy (LEX, 0.0036) is statistically significant at 5% level of significance. Government expenditure on education (GEE), secondary school enrollment (SSE) and tertiary institutions enrollment (TIE) did not conform to their expected signs and are not statistically significant. Thus in the long-run only life expectancy (LEX) affects agricultural sector growth in Nigeria. Table 4 shows the short run dynamics which reveals a positive relationship between the logs of government expenditure on education (GEE), government expenditure on security (GES), one lag of life expectancy (LEX), log of primary school enrollment (PSE), log of Tertiary institutions enrollment (TIE) and log of real agric

gross domestic product (RAGDP). A negative relationship however exists between the log of government expenditure on health (GEH), one lag period of Life expectancy (LEX). The results further show that only one lag period of life expectancy is statistically significant in the short-run at 5% level of significance.

The results of granger causality test in Table 5 carried out to determine the causality relationship between human capital development, national security and agricultural sector growth in Nigeria show that the probability values are greater than the chosen 5% level of significance. This implies no causality relation between human capital development, national security and agricultural sector growth in Nigeria. Thus previous values of the real agric GDP cannot predict the values of human capital development and security vice versa. The results of the second order tests in Table 6 and stability tests results show that the model does not suffer from problem of auto-correlation and normality of residuals. The Ramsey Reset test further shows that the model is well specified. Thus the model is well behaved. The CUSUM and CUSUMSQ tests show a very stable model.

Test of Hypothesis

This study sought to test the following hypotheses

1. There is no significant relationship between human capital development and agricultural sector growth in Nigeria.

2. There is no significant relationship between national security and agricultural sector growth in Nigeria.

3. There is no causality relationship between human capital development,

national security and agricultural sector growth in Nigeria.

Hypothesis 1

Ho: there is no significant relationship between human capital development and agricultural sector growth in Nigeria. Using the t-test and the t-probability to test the hypothesis, the decision rule is if the calculated t-statistics at 5% level of significance is greater than is greater than ± 1.965 which is the tabulated value at the level of significance for two tailed test, then we reject H_0 and accept H_1 vice versa.

Decision: based on the decision rule the long-run coefficients show that the coefficient of life expectancy (LEX, 0.0036) is significant at the chosen 5% level of significance. Thus we reject the null hypothesis and accept the alternative that a significant relationship exists between human capital development and agricultural sector growth in Nigeria

Hypothesis 2

There is no significant relationship between national security and agricultural sector growth in Nigeria. Decision: the coefficient of government expenditure on security (GES) has a probability value of 0.1774 and t-statistic value of 0.3666290.

It is statistically insignificant at chosen 5% level of significance. Thus the null hypothesis is accepted that no significant relationship exists between national security and agricultural sector growth in Nigeria.

Hypothesis 3

There is no causality relationship between human capital development, national security and agricultural sector growth in Nigeria. Decision: from the granger causality test result shown in table 4.5 the probability values for government expenditure on education (GEE), government expenditure on health (GEH),

government expenditure on security (GES) and secondary school enrollment (SSE) are all greater than 0.05 (5% level of significance) hence we accept the null hypothesis that no causality relationship exists between human capital development, national security and agricultural sector growth in Nigeria.

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary of Findings

This study centered on human capital development, national security and agricultural sector growth in Nigeria. It was guided by stated objectives and research questions. In the course of the research the following findings were made

is however statistically insignificant. Life expectancy significantly and positively affects agricultural sector growth in Nigeria both in the short-run and in the long-run.

1. Government expenditure on health, government expenditure on security, and primary school enrollment all have a positive relationship with agricultural sector growth in Nigeria both in the short-run and in the long-run. The relationship

2. National security has positive but non-significant relationship with agricultural sector growth in Nigeria.

3. No causality relationship exists between human capital development, national security and agricultural sector growth in Nigeria.

CONCLUSION

This research dwelt on human capital development, national security and agricultural sector growth in Nigeria between the periods of 1980-2017. The auto-regressive distributed lag model was used in the study. The study revealed that government expenditure on health, government expenditure on security, and primary school enrollment all have a

positive short-run and long-run relationship with agricultural sector growth in Nigeria. The relationship is however insignificant. It further shows that government expenditure on education, secondary school enrolment and tertiary institutions enrolment all have negative relationship with agricultural sector growth. It established

that high life expectancy will increase agricultural sector growth in Nigeria since it has a positive and significant relationship with agricultural sector growth in Nigeria during the period under

study. The outcome of this research supports the human capital development theory and the modernization theories but counters the militarism theory.

RECOMMENDATIONS

Based on the results of this study, it is recommended as follows

1. That federal government should increase the budget for the health sector to at least 15% from the present 3.9%. This will conform to the Abuja 2001 declaration of the African union. The increased funding should be deployed in strengthening the basic health system; provide an affordable health insurance scheme that increase access to quality healthcare and improve wellbeing of citizens and as well improve hygiene. This will lead to increase in life expectancy in Nigeria which will significantly increase agricultural sector growth in Nigeria,
2. Government at all levels should ensure implementation of compulsory basic education. Policies like school

feeding program, free tuition and provision of instructional materials to pupils should be sustained. This ultimately will lead to increase in enrollment, reduce the number of out-of-school children and on the long-run increase agricultural sector growth in Nigeria.

3. National security architecture should be re-designed to dwell more on preventive measures to forestall security breakdown which leads to loss of lives, properties and ultimately reduce economic growth. Emphasis should be on adoption of latest technologies for intelligence gathering and detection of early warning signals. This will lower crime rates, increase life expectancy and ultimately agricultural sector growth in Nigeria.

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