

## Analysis of the Agricultural Sector of Ghana and Its Economic Impact on Economic Growth

Patrick Enu

Methodist University College, GHANA.

[patrickenu@gmail.com](mailto:patrickenu@gmail.com); [penu@mucg.edu.gh](mailto:penu@mucg.edu.gh)

### ABSTRACT

*The research seeks to determine the impact of the agricultural sector on Ghana's economic growth and the effect of the various sub-sectors of the agricultural sectors on Ghana's economic growth. The study uses time series (1996-2006) data on agriculture, service, industry and the various sub-sectors under agriculture, which includes forestry, fishery, crops/ livestock and cocoa. A regression model was specified and OLS was employed to estimate the respective impact of agriculture, service and industry on GDP growth. At the end of the study agricultural output had a significantly positive impact on Ghana's growth as compared to the other sectors (agricultural output (0.354515); service output (0.283401); industrial sector (0.303257)). In addition, the study further analysed the effect of the various sub sectors under agricultural sector in GDP growth since the agricultural sector contributed more significantly to GDP. At the end of the study cocoa subsector was identified to be vital to economic growth and development in Ghana. Hence, the cocoa subsector should continue to be priority position even with the discovery of oil.*

**Keywords:** Agricultural sector, economic growth, GDP

### INTRODUCTION

Agriculture is the key in the economic growth and development process of Ghana. The agricultural sector contributes about 40% to Ghana's gross domestic product (GDP) (The State of the Ghanaian Economy, 2000). This sector does not only contribute to Ghana's GDP, but also absorb a lot of labour force and then provides raw materials for industrial growth and development. In Ghana, the GDP growth rate was 4.4%, while that of the agricultural growth rate was 4.2% in the year 2000 – 2003. In 2003 – 2007, the GDP growth rate has been increased to 5.8%, while that of the agricultural growth rate has also been increased to 5.2% (The State of the Ghanaian Economy in 2007).

The overall economic growth and development of a country depends upon the health of the agricultural sector. The reasons are that it provides food, raw materials, and foreign exchange which further push industrialization in Ghana (Johnston, 1970).

Many researchers have found evidence that either agriculture affects economic growth positively, negatively or no evidence at all (Clark, 1940; Kuznets, 1966; Murphy et al. 1989; Mundak et al. 1989; Kiminori, 1992; Rosegrant et al. 1995, Galen et al. 2000; Coelli et al. 2003). For instance, Tiffin and Irz (2006) found that there is enough evidence which supports the conclusion that agricultural is the main cause of overall grow rate. Trimmer (2005) also correlated poverty with growth in agricultural output and found out that at the provincial level about two-thirds of the reduction in poverty was due to growth in agricultural output.

It has been the quest for Ghana to achieve higher levels of economic growth. Various policies and programs have been suggested to drive this growth process like the better Ghana agenda by the current government, as well as vision 2020 and so on. Studies reveal that factors such as land, labour, foreign direct investment (FDI) and government spending

stimulate the growth process in the sectors. A large number of studies have found evidence suggesting that human capital is significant in determining economic growth (Barro, (1991). Mankiw et al, (1992). Barro and Sala-i-martin (1995). Brunett, et al, (1998). Hanushek and Kimkwi, (2000). FDI on growth has provided more or less consistent findings affirming a significant positive link between the two (Borensztein et al, (1998); Hermes and Lensink, (2000); Lensink and Morrissey, (2006)). Also, according to Romer (1986 & 1990) and other studies, Solow, (1962). Lucas, (1988) and Grossman and Helpman, (1991). The world economy grows because of technological progress.

In addition, the effect of the agricultural output of economic growth has not been left out of the literature concerning the major determinants of economic growth in some countries. For instance, in Ghana, the agricultural sector has been identified as a major contributor to growth. As such many policies have been geared towards the agricultural sector in order to enhance economic growth and development in Ghana. Unfortunately, studies on the impact of the various agricultural sub-sectors of economic growth in Ghana are limited. As a result, this study seeks to investigate the impact of the agricultural sector on Ghana's economic growth and determine which sub-sectors under agriculture contribute significantly to GDP growth.

The objectives of this study are as follows:

1. To investigate the effect of agricultural output on Ghana's economic growth.
2. To evaluate the effect of the various sub-sectors of agriculture in Ghana's economic growth.

This study is of critical importance because of the following reasons:

1. The study would be a useful tool in the hands of the Ministry of Economic Planning.
2. In addition, it is envisaged that the result of this study would help create an awareness of the productivity of the various sub-sectors of agriculture to the people of Ghana and the policy makers.
3. This would enable the nation to adopt strategies for balance growth, which will help to achieve the growth targets set by the budget.
4. Finally, the findings of the study would provide evidence for further research work and fill the literature gap concerning Ghana's economic growth process

## MATERIAL AND METHODS

### Regression Analysis

A statistical procedure called regression analysis can be used to develop an equation showing how the variables are related. In regression terminology, the variable being predicted is called the dependent variable. The variable or variables being used to predict the values of the dependent variables are called independent variables. We have the simple regression, but for this study a multiple regression was used. It is the study of how a dependent variable  $Y$  is related to two or more independent variables. A multiple regression model for this study was specified as:

For the purposes of this study, the first growth model was specified as:

$$\text{GDP growth} = f(A, S, I) + \varepsilon \text{ ----- (1)}$$

Where:

A = agriculture output measured as percentage of GDP growth.

S = services output measured as percentage of GDP growth.

I = industry output measured as percentage of GDP growth.

$\epsilon$  = error term

The second multiple regression equation was specified as:

$$\text{GDP growth} = f(\text{CL}, \text{C}, \text{F}, \text{FI}) + \epsilon \dots \dots \dots (2)$$

Where:

CL = crops/livestock output measured as percentage of agricultural output.

C = cocoa output measured as percentage of agricultural output.

F = forestry output measured as percentage of agricultural output.

FI = fisheries output measured as percentage of agricultural output.

$\epsilon$  = stochastic term

**Method of Estimation**

Ordinary least squares (OLS) method of estimation was used for estimating the unknown parameters of the linear regression models.

**Sample Size of the Data**

The study period spanned from 1996 to 2006. This was due to the unavailability of data. In effect, the sample size is 10. This does not meet the central limit theory  $\geq 30$ . This problem is considered as one of the limitations of the study.

**Source of Data**

<i>Variable</i>	<i>Source of Data</i>
GDP Growth	The State of the Ghanaian Economy, various Series and Ghana Statistical Service (1996-2006)
Agriculture Output	The State of the Ghanaian economy, various series (1996-2006)
Cocoa	The State of the Ghanaian economy, various series (1996-2006)
Crops/Livestock	The State of the Ghanaian economy, various series (1996-2006)
Forestry	The State of the Ghanaian economy, various series(1996-2006)
Fisheries	The State of the Ghanaian economy, various series(1996-2006)

**Statistical Packages for Estimation**

The statistical package used for the estimation of the data was GRETLE.

**RESULTS AND DISCUSSION**

The regression results of the impact of the various sectors on GDP growth is shown below.

Method of estimation: OLS

Sample size: 1996-2006

Dependent variable: GDP growth.

**Table 1. Summary Output of Equation 1**

Variable	Coefficient	Std. Error	t- statistic	VIF
Constant	-2.34797	1.56764	-1.4978	
A	0.354515	0.15489	2.2888	1.2725
S	0.283401	0.287033	0.9873	1.81805
I	0.303257	0.167933	1.8058	1.80391

DW =1.57;  $R^2=0.73144$ ; adj.  $R^2 =0.61634$ ;  $F = (3, 7) =6.35484$ ; t-critical = (7, 5%) = 2.365, = (7, 10%) =1.895,

Source: Author's Computation 2012

A=agriculture output measured as percentage of GDP growth.

S = services output measured as percentage of GDP growth.

I = industry output measured as percentage of GDP growth.

Based on the Durbin Watson statistics from the regression (1.57). It indicates the presence of no autocorrelation since this value (DW = 1.57) falls between 1.5 and 2.5 judging from the rule of thumb. Also judging from the variance inflation factor (VIF). All values are less than 10 which indicate the presence of no multi-collinearity. Likewise the adjusted  $R^2$  and unadjusted  $R^2$  imply that the overall fit is satisfactory with an R squared of 0.61634 and 0.73144 respectively, which implies a good fit. In addition,  $R^2 < DW$ , which implies the results obtained is not spurious. The F statistic which is 6.35484 is statistically significant at 0.05% significance level since the  $F_{observed} > F_{critical}$  on the critical values of 5.89, 4.35, and 3.07 respectively. The above explanation implies that the model is good and can be used to make inferences.

Generally based on researches and observations agriculture has been known and statistically proven to have a positive impact on the Ghanaian economy. From Table 1, a 1% increase in agricultural output will cause GDP growth to increase by 0.354515%. The reverse is true. This implies that a positive link exist between agricultural output and economic growth. It is statistically significant at 5% significance level. Thus, if we increase agriculture output, then GDP growth will also increase. In addition, from the results, it was realized that agriculture sector contributes more to GDP growth than the other sectors of the economy. This is consistent with the findings of Todaro and Smith (2009). [See also Oguchi, (2008); Wayo (2002); Ogen (2003)]. Therefore, if the policy makers channel more investments into the agricultural sector, it will help increase GDP growth in Ghana.

A positive relationship between services sector and economic growth was found. A 1% increase in service output will cause GDP growth to increase by 0.283401%. This finding is consistent with Oguchi (2008) and Baer Larry Samuelson (2002). The estimated t-statistics which is 0.9873 has been found to be statistically insignificant at (7, 5%) = 2.365, since the critical values is less than the t - observed.

Industry also appeared to have a positive relationship with GDP growth. A 1% increase in industry output will cause 0.303257% increase in GDP growth. This finding is consistent with Good luck Jonathan (2011) assertion that realization of Nigeria's vision 2020 lies greatly on the manufacturing sector (see also Parham 1999 and Hall 1998). The estimated t-statistics which is 1.8058 has been found to be statistically insignificant at (7, 5%) = 2.365, and (7, 10%) =1.895 since both critical values are less than the t-observed. This result is

however, not surprising because the total contribution of the industrial sector to the GDP of the Ghanaian economy has been very low. This has made the result of the sector not consistent over the study period. The literature shows that, the sector faces several challenges. Osei, (2009) noted that inadequate raw materials, inputs for feeding the industries, high cost of locally produced raw materials, increased competition from imports associated with trade liberalization and low levels of aggregate demand associated with economic restraints measures, inadequate infrastructures, power supply, poor transport and harbour facilities coupled with low utilization of installed capacities as a result of obsolete plant and machinery, constraint the industry sector to a large extent. The load shedding by the Electricity Company of Ghana (ECG) also constrained the sector especially the manufacturing sub-sector to a considerable extent, leading to an unimpressive performance of the sector in the year 2006. All these problems accounted for the very low performance of the industrial sector over the study period.

### A REGRESSION ANALYSIS OF THE SUB-SECTORS OF THE AGRICULTURAL SECTOR AND ITS IMPACT O GDP GROWTH

Secondly, this work determined the extent to which the various sub sectors of agriculture sector contribute to economic growth of Ghana, since the agricultural sector was identified as the driving force of the Ghanaian economy.

Method of estimation: OLS

Sample size: 1996-2006

Dependent variable: GDP growth.

**Table 2. Summary Output of Equation 2**

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-statistics</i>	<i>VIF</i>
<i>Constant</i>	1.70838	1.05354	1.6216	
<i>Cl</i>	0.237591	0.182515	1.3018	1.8478
<i>C</i>	0.0719482	0.0188315	3.8206	1.1156
<i>F</i>	-0.0495828	0.0816081	-0.6076	1.4640
<i>FI</i>	-0.428743	0.153076	-2.8008	1.3902

$DW = 1.54$   $R^2 = 0.80868$ ;  $adj. R^2 = 0.65562$ ;  $F = (4, 5) = 5.2834$ ;  $t$ -critical = (7, 5%) = 2.365, = (7, 10%) = 1.895,

Cl = crops/livestock output measured as percentage of agricultural output.

C = cocoa output measured as percentage of agricultural output.

F = forestry output measured as percentage of agricultural output.

FI = fisheries output measured as percentage of agricultural output.

From Table 2 the value of the Durbin Watson statistics is 1.54. It indicates the presence of no autocorrelation since the value falls between 1.5 and 2.5 judging from the rule of thumb. Also based on the variance inflation factor (VIF), variables are not multi-collinearity. The adjusted  $R^2$  (0.80868) and unadjusted  $R^2$ (0.65562) imply that the overall fit of the model is very satisfactory In addition, the estimation is not spurious since  $R^2 < DW$ . The F statistic which is 5.2834 is also statistically significant at 5% (the critical value of  $F = 5.19$ ). This implies the

overall regression model is statistically significant and therefore, can be used to make inferences.

From Table 2, based on my report a 1% increase in crops/livestock will cause GDP growth to increase by 0.237591%. This implies a positive link between crops/livestock and economic growth. The estimated t-statistics which is 1.3018 has been found to be statistically insignificant at  $(7, 5\%) = 2.365$  and  $(7, 10\%) = 1.895$ . The reason is both critical values are less than the t- observed. This indicates that crops/livestock do not have a substantial significant effect on Ghana's GDP growth. This result is not consistent with CA Ighodaro, 2006 Olayide and Essang, 1976.

Cocoa has been found to significantly contribute to economic growth. Based on the report the coefficient of the cocoa sector is positive as expected based on theory. Specifically, a 1% percent increase in cocoa production will cause GDP growth to increase by 0.0719482% approximately, *ceteris paribus*. It can be inferred that cocoa has a positive impact on GDP growth in Ghana, This result is in support of theory and concurs with the result obtained by McKay and Aryteey 2005, Bogetic et al.2007, Bretsinger et al, 2008. The estimated t-statistics which is 3.8206 has been found to be statistically significant at  $(7, 5\%) = 2.365$  and  $(7, 10\%) = 1.895$  since both critical values are greater than the t- observed. Hence an increase in cocoa production is vital to Ghana's economic growth process.

The coefficient of forestry is negatively signed and is statistically insignificant judging from the t- statistic. A 1% increase in forestry will cause GDP growth to decrease by 0.0496%, all other things remaining the same. This indicates that forestry do not have a substantial or statistically significant effect on Ghana's GDP growth in the long run. This result obtained is consistent with World Bank, 1992, Andrew D Foster and Mark R. Rosenzweig, 2003. The estimated t-statistics which is 0.6076 has been found to be statistically insignificant at  $(7, 5\%) = 2.365$  and  $(7, 10\%) = 1.895$  since both critical values are greater than the t- observed. Base on empirical researches forestry has not shown much significant growth in countries due to concerns about the phenomena of global warming and declining biodiversity and this has led to an increase in attention paid to the link between the disappearance of the world's forest and economic growth. Hence much investment cannot really be relied on forestry because it will not increase economic growth in the economy. And in the long run forestry provide enormous ecosystems services like soil protection, flood mitigation and renewable resources.

The coefficient of fishery is negatively signed and is statistically insignificant from the t- statistics. A 1% increase in fishery will cause GDP growth to decrease by 0.04287%, all other things remaining the same. The estimated t-statistics which is 0.03796 has been found to be statistically insignificant at  $(7, 5\%) = 2.365$  and  $(7, 10\%) = 1.895$  since both critical values are greater than the t-observed This indicates that fishery do not have a substantial or statistically significant effect on Ghana's GDP growth and this is also true judging from the p- value.

This study emphasizes that we still need the agriculture sector to be able to survive, and the major sub sector which government should pay attention to should be the cocoa sub- sector and this was consistent with the then Kufour's (New Patriotic Party) government policy to increase cocoa's production. If Ghana still wants to solve the problem of poverty in the short term, medium term and long term, then the agricultural sector must be invested in. However, the resources must be channelled to the cocoa sub- sector looking at the contributions cocoa has had on the Ghanaian economy. Though Ghana has found oil we should not neglect the cocoa sub sector of the agricultural sector because that is where Ghana can get enough foreign exchange to further any development.

## RECOMMENDATIONS

Since this study has identified the agricultural sector of Ghana to still be the main stay of the Ghanaian economy, more of Ghana's resources should be allocated to the agricultural sector, more importantly to the cocoa subsector.

## CONCLUSION

The study looked at the impact of the various sectors of Ghana on Ghana's economic growth the method applied in the study was Ordinary Least Squares estimation technique. The study found that agricultural output had a positive impact on Ghana's growth, that is, a 1% increase in agricultural output will cause GDP growth to increase by 0.354515%. This implies a positive link between agricultural output and economic growth and. It was found to be statistically significant at 5% level. In addition services output had the correct response, that is, a 1% increase in services output will cause GDP growth to increase by 0.283401% this implies a positive link between services output and economic growth in Ghana, but it was found to be statistically insignificant. Finally the industrial sector also had the correct response, that is, a 1% increase in industrial output will cause GDP growth to increase by 0.303257% and it was also statistically significant.

In addition, the study went further to analyse how the various sub sectors under agricultural sector impact on GDP growth in Ghana since the agricultural sector was identified to be the most potent sector to GDP contribution in Ghana. The study identified crops/livestock to impact positively on Ghana GDP growth, that is, a 1% increase in crops/livestock will cause GDP to increase by 0.237591%, though it was statistically insignificant. Furthermore, fishery and forestry was negatively signed, that is, a 1% increase in fishery/forestry will cause GDP growth to decrease by 0.04287% and 0.0496% respectively. Finally, the cocoa sub sector impacted positively on GDP growth. A 1% t increase in cocoa production will cause GDP growth to increase by 0.0719482%. It is statistically significant. Hence, it can be concluded that the cocoa sub sector of the agriculture sector has a positive impact on GDP growth in Ghana and thus, massive investments should be directed to the cocoa subsector of the agriculture sector for further economic expansion in Ghana.

## REFERENCES

- [1] Alesina, Alberto, & Roberto, P. (1995). The Political Economy of Budget Deficits. *IMF Staff Working Paper*, 42(1), 1-31.
- [2] Aryeetey, E., & Fosu, A.K. (2005). Economic Growth in Ghana: 1960-2000. *AERC Growth Project Workshop*, Cambridge.
- [3] Aryeetey, E., & Trap, F. (2000). *Structural Adjustment and After: Which Way Forward* in Aryeetey, Ernest, Jane Harrigan and Machiko Nisanke (Eds) Economic Re-forms in Ghana: The Miracle and the Mirage, Oxford: James Currey and Woeli Publishers
- [4] Aryeetey, E., & Fosu, A. K. (2002). Economic Growth in Ghana: 1960-2000. *Draft Chapter for AERC Growth Project Workshop*, Cambridge.
- [5] Barro, R. J., & Sala-i-Martin, X. (1991). Convergence across States and Regions. *Brookings Papers on Economic Activity*, No. 1.
- [6] Barro, R. J. (2003). Determinants of Economic Growth in a Panel of Countries. *Annals of Economics and Finance*, 4. 231-274.

- [7] Barro, R., & McCleary, R. (2003). Religion and Economic Growth. *NBER Working Paper*, 9682.
- [8] Bank of Ghana Monetary Policy Committee Press Release, December 12 2011
- [9] Borensztein, E., De Gregorio, J., & Lee, J.W. (1998). How Does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics*, 45, 115-135.
- [10] Databank Group Research Economic Analysis Monthly Report, 2009.
- [11] Domar, E. (1946). Capital Expansion, Rate of Growth and Employment, *Econometrica*, 14, 13. 1950-
- [12] Chenery, H. B., & Syrquin, M. (1995). *Pattern of Development, 1950-1970*. Oxford: Oxford University press.
- [13] Easterly, W., & Rebelo, S. (1993). Fiscal Policy and Economic growth. *An Empirical Journal of Monetary Economics*, 32, 417-458.
- [14] Easterly, W. (2001). *The Elusive Quest for Growth: Economists' Adventures and Misadventures in the Topics*. Cambridge MA: MIT Press.
- [15] Easterly, W., & Rebelo, S. (1993). Fiscal Policy and Economic growth. *An Empirical Journal of Monetary Economics*, 32, 417-458.
- [16] Easterly, W., & Levine, R. (1997). Africa's Growth Tragedy: Policies and Ethnic Divisions. *Quarterly Journal of Economics*, 112(4), 1203-1250.
- [17] Edem, K. D. (2003). *Role of Agriculture in the Ghanaian economy*.
- [18] Encarta, P. (2009). *Economic Growth and Agriculture*. © 1993-2008, Microsoft Corporation.
- [19] Enu, P. (2009). *Macroeconomic Determinant of Economic Growth in Ghana*. Department of economics, Kwame Nkrumah University of science and technology.
- [20] Fagerberg J. (1987). A Technology Gap Approach to Why Growth Rates Differ. *Research Policy*, 16(2-4), 87-99.
- [21] Fischer, S. (1993). The Role of Macroeconomic Factors in Growth. *Journal of Monetary Economics*, 32, 485-512.
- [22] Food and Agricultural Organizations, (2009). Challenges of agricultural sector.
- [23] Gary, S., Becker, Kevin, M., Murphy, & Robert, T. (1994). *Human Capital, Fertility and Economic Growth*. The University of Chicago press 0-226-04119-0 pg 323-350.
- [24] Ghana Poverty Reduction Strategy II Annual Progress Report (2007).
- [25] Gollin, Douglas; Parente, Stephen and Rogerson, Richard(2000). Farmwork, Homework and International Income Differences. Unpublished manuscript.
- [26] Gobind, N. (2009). *Challenges of Agriculture in Ghana: What is to be done*
- [27] Granato, J., Inglehart, R., & Leblang, D. (1996). The effect of cultural values on economic development: theory, hypotheses, and some empirical tests. *American Journal of Political Science*, 40(3), 607-631.
- [28] Grossman, G. M., & Helpman, E. (1991). Quality Ladders in the Theory of Growth. *Review of Economic Studies*, 58, 43-61.



- [29] Inglehart, R., & Baker, W. (2000). Modernization, cultural change and the persistence of traditional values. *American sociological review*, 65, 19-51.
- [30] Harrod, R. F. (1939). An Essay in Dynamic Theory. *Economic Journal*, 49(193), 14-33.
- [31] Hall, R. E., & Jones, C. I. (1999). Why Do Some Countries Produce So Much Output per Worker than Others? *Quarterly Journal of Economics*, 114(1), 83-116.
- [32] Hermes, N., & Lensink, R. (2000). Foreign direct investment, financial development and economic growth. *Journal of development studies*, 40(1), 142-163.
- [33] IMF and World Bank (2001). Enhanced Heavily Indebted Poor Countries (HIPC) Initiative-Preliminary Document Ghana, *International Monetary Fund and International Development Association Research Paper*.
- [34] ISSER, (2006). The State Of Ghanaian Economy. University of Ghana, Legon, Ghana.
- [35] ISSER, (2008). The State Of Ghanaian Economy. University of Ghana, Legon, Ghana.
- [36] Johnston, B. F. (1970). Agriculture and Structural Transformation in Developing Countries: A Survey of Research. *J. Econ. Literature* 8, 369 – 404.
- [37] Knack, S., & Keefer, P. (1995). Institutions and Economic Performance: Cross-Country Tests using Alternative Institutional Measures. *Economics and Politics*, 7, 207-227.
- [38] Knack, S., & Keefer, P. (1997). Does Social Capital have an Economic Impact? A Cross-Country Investigation. *Quarterly Journal of Economics*, 112(4), 1252-1288.
- [39] Kiminori, M. (1991). Agricultural Productivity Comparative Advantage and Economic Growth. *Journal of Economic Theory*, 58, 317-334.
- [40] Kormendi, R. & Meguire, P. (1985). Macroeconomic determinants of growth: cross-country evidence. *Journal of Monetary Economics*, 16(4), 141-163.
- [41] Kuznets, S. (1959). *Economic Growth*. New York: The Free Press.
- [42] Landes, D. (2000). Culture makes almost all the Difference. In Harrison E. L. and Huntington P. S. (eds.) *Culture Matters: How Values Shape Human Progress* (pp. 2-13). New York: Basic Books.
- [43] Lewis, A. (1955). *The Theory of Economic Growth*. London: George Allen and Unwin.
- [44] Lichtenberg, F. (1992). R&D Investment and International Productivity Differences, NBER Working Paper, No. 4161.
- [45] Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22, 3-42.
- [46] Mark, W., Rosegrantm, & Robert, E. E. (1995). Total Factor Productivity and Sources of Long Term Growth in Indian Agriculture, EPTD Discussion paper No 7.
- [47] Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*, 107(2), 407-437.
- [48] Nnadi, K. U., & Falodun, A. B. (2003). *New Approach Economics*. Lagos: Longman Nigeria Ltd.

- [49] Nugent, N. (2000). *The European Commission*. Basingstoke: Palgrave Macmillan.
- [50] Nyanteng, V. K., & Wayo, S. (1997). *Policy Dynamics, Trends in Domestic Fish Production and Implications for Food Security in Ghana*. Legon, Ghana: ISSER Publication.
- [51] Ofori, V. (2010). *The Impact of Foreign Direct Investment on the Economic Growth of Ghana*, Central University College, Accra.
- [52] Ogen, O. (2003). *Patterns of Economic Growth and Development in Nigeria since 1960*. Essays in Nigerian Contemporary History. Lagos: First Academic Publishers
- [53] Oguchi, C. (2008). *The Role of Agric in Economic Growth*. The Nigerian Experience.
- [54] Osei, R. (2002). *Development with a human face: Experiences in Social Achievement and Economic Growth*. Oxford: University press.
- [55] Owusu, A. A. (1987). Agricultural development policy in Ghana. *Food Policy*, 12(3). August 1987, 243-254. doi:10.1016/0306-9192(77)90024-0.
- [56] George Petrakos and Paschalis Arvanitidis (nd). University of Thessaly Pedion Areas, volos, 38334, Greece. <http://region-developpement.univ-tln.fr/fr/pdf/R27/Arvanitis-Petrakos.pdf>
- [57] Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy* 94(October), 1002-37.
- [58] Romer, P. (1990). Endogenous Technological Change. *Journal of Polical Economy*, 98(5), S71-S102.
- [59] Rostow, Walt W. (1963). *The Economics of Take-off into Sustained Growth; proceedings of a Conference Held by the International Economic Association*. London: Macmillan; New York: St Martin's Press.
- [60] Rodrik, D., Subramanian, A., & Trebbi, F. (2002) *Institution rule: the primacy of institution over geography and integration in economic development* NBER Working Paper No. 9305.
- [61] Swan, T.W. (1956). Economic Growth and Capital Accumulation. *Economic Record* 32(November), 334-61.
- [62] Solow, R. M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70(1), 65-94.
- [63] Solow, R.M. (1956). A Contribution to the Theory of Economic Growth. *Quarterly Journal of Economics*, 70(February), 65-94.
- [64] Teal, F. (2001). *Education, Income, Poverty and Inequality in Ghana in the 1990s, Centre of the Study of African Economies. Department of Economics*, University of Oxford.
- [65] Temple, J., & Johnson P. (1998). Social Capability and Economic Growth. *Quarterly Journal of Economics*, 113(3), 965-990.
- [66] Tiffin, R., & Irz, X. (2000). Is Agriculture the Engine of Growth? *Agric. Econ.*, 35, 79-89.
- [67] Timmer, C. P. (2005). *Agriculture and Pro-Poor Growth: Lessons from Asia and the literature*. Washington DC. Cent. Global Dev. Processed.

- [68] Todaro, M., & Smith, S. C. (2006). *Economic Development* (9<sup>th</sup> edition). Boston: Pearson Addison-Wesley Printing Press.
- [69] Todaro, M. P., & Smith, S. C. (2009). *Economic Development*. England.
- [70] Tim, J., Coelli, & Prasada Rao, D.S. (2003). *Total Factor Productivity Growth in Agriculture; A Malmquist Index Analysis of 93 countries, center for Efficiency and Productivity Analysis*, school of Economics, University of Queensland, working series No 02/2003
- [71] Timmer, C. P. (1988). *The Agricultural Transformation* in H. Chenery and T.N. Srinivasan (eds). *Handbook of Development Economics*, Amsterdam, North Holland.
- [72] Valdes, A., & Foster, W. (2005). *Reflections on the Role of Agriculture in Pro-Poor Growth*, Research Workshop: The Future of Small Farms: Wye, Kent.
- [73] World Bank, (1998). *Assessing Aid: What Works, What Doesn't, and Why*, Washington, DC: Oxford University Press for the World Bank.
- [74] World Bank Country brief (2008).
- [75] World Bank (2009). *World Development Report Database CD ROM*, Washington DC.
- [76] Yair Mundlak, Domingo Cavallo and Roberto Domenech (1989) *Agriculture and Economic Growth in Argentina 1913-84*, Research Report PN –ABB-358.
- [77] Zak, P., & Knack, S. (2001). Trust and growth. *The Economic Journal*, 111, 295-232.