



ASHESI UNIVERSITY COLLEGE

ANALYSING TRENDS IN AGRICULTURAL OUTPUT IN GHANA 1995- 2015: UNDERLYING CAUSES AND OPTIONS FOR SUSTAINABLE GROWTH

B. SC. BUSINESS ADMINISTRATION

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This is an undergraduate thesis submitted to the Department of Business Administration, Ashesi University College in partial fulfilment of the requirements for the award of Bachelor of Science degree in Business Administration.

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DECLARATION

I hereby declare that this dissertation is the result my own original work and that no part of it has been presented for another degree in this University or elsewhere.

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I hereby declare that the preparation and preparation of the dissertation were supervised in accordance with the guidelines on the supervision of dissertation laid down by Ashesi University College.

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Date: May 2, 2017

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Borrowing the words of King David in Psalm 121, I declare that the Lord is my keeper and shade, he neither slumber nor sleeps as far as my life is concerned. My utmost gratitude goes to the origin of my life - God Almighty for seeing me through this stage of my life. He has been faithful to me in all my endeavours and I pray to live out my purpose before I return to Him.

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ABSTRACT

Agriculture's impact in Africa has led to the conclusion that it is the lifeblood of many Africa economies. In Ghana, agriculture was historically the dominant sector of the real economy accounting for more than 30 percent of GDP post-independence although more recently, it has declined sharply and is the smallest sector of the economy as at 2016. Despite that, the sector still plays a key role in Ghana's economy and employs 44.7 percent of the population above 15 years. The continuous decline of output in the agricultural sector and its sub-sectors growth in Ghana raises many questions worth investigating.

This paper investigates the trends in productivity of the agricultural sector to outline causal factors and options for sustainable growth. Literature indicates that the sector will remain as a mainstay sector for the growth of Ghana's economy in the coming years. The study uses in-depth analysis of interviews to outline causal factors and options for growth in Ghana's agriculture sector. The study found budget allocation, misplaced priorities, lack of technology commercialisation, among others, as some factors responsible for the declining performance in the agriculture sector. The paper concludes with recommendations for the turnaround of the sector and call for further studies into this area of research.

Keywords: agriculture, sustainable development, gross domestic product, productivity.

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LIST OF ACRONYMS

AGRA	Alliance for a Green Revolution in Africa
CAADP	Comprehensive Africa Agriculture Development Programme
CDPF	Cobb Douglas Production Function
CEO	Chief Executive Officer
DCGE	Dynamic Computable General Equilibrium
DEA	Data Envelope Analysis
FAO	Food and Agriculture Organisation
FARA	Forum for Agricultural Research in Africa
FAOSTAT	Food and Agriculture Organisation Statistic
GDP	Gross Domestic Product
GSS	Ghana Statistical Service
IRB	Internal Review Board (Ashesi)
LDC's	Less Developing countries
MoFA	Ministry of Food and Agriculture
NDC	National Democratic Congress
NPP	New Patriotic Party
PFP	Partial Factor Productivity
SADA	Savannah Accelerated Development Authority
SSA	Sub-Sahara Africa

TFP Total Factor Productivity

WDI World Development Indicators

WWII Second World War

US United States

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CHAPTER 1: INTRODUCTION

1.1 Overview

Agriculture remains a fundamental instrument for sustainable development and poverty reduction in this 21st century (Kibaara, Ariga, Olwande & Jayne, 2008 & World Bank, 2007). Its impact in Africa has led to the conclusion that it is the lifeblood of many Africa economies. The agricultural industry employs about 70 percent of the workforce in Africa and contributes an average of 30 percent to the continent's Gross Domestic Product (FAO, 2013 & Kariuki, 2011).

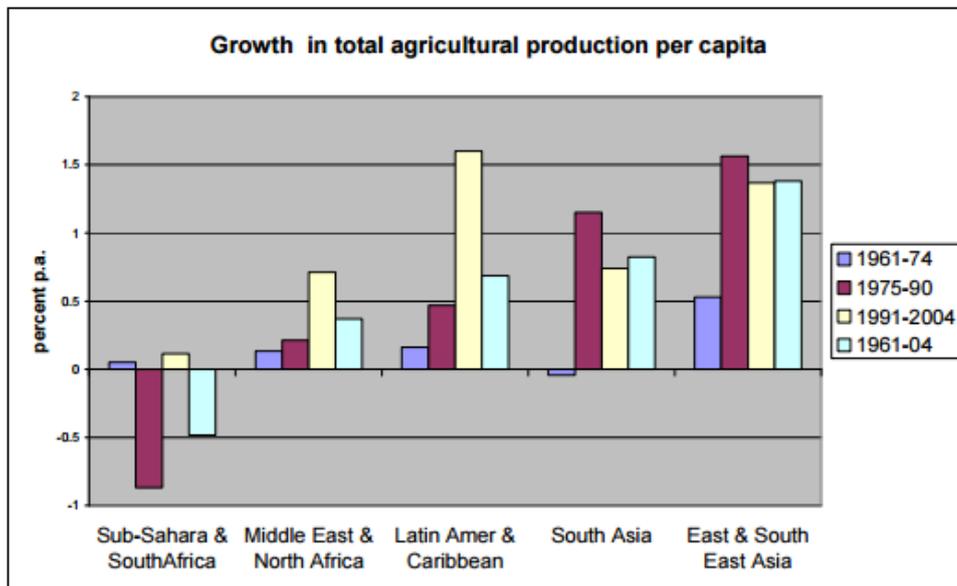
In Ghana, for example, agriculture was historically the dominant sector of the real economy accounting for more than 30% of GDP post-independence, although more recently, it has declined sharply and is the smallest sector of the economy as at 2016 (Budget Statement, 2017).

However, Africa still lags behind other regions in terms of agricultural productivity in the world (Fuglie & Rada, 2013, Wik, Pingali & Broca, 2008, & World Bank, 2007). Fuglie & Rada (2013) recently argued that “agricultural productivity in Sub-Saharan Africa (SSA) remains low and is falling farther behind other regions of the world”. In addition, Wik, Pingali and Broca (2008) equally underlined that SSA is the only region in the world where per capita agricultural output has not seen a sustained increase over the last four decades. This suggests that the SSA region has not given its best in terms of agricultural productivity and could produce more given the availability of its land and abundant labour force.

Invariably some challenges persist that prevent Africa's agricultural sector from fulfilling its potential. The socioeconomic, policy, biophysical constraints, poor storage facilities, inadequate market facilities and unsustainable land management practices, among others have been identified as the major causes of low agricultural

productivity in Africa (Ehui & Pender, 2005). The figure below compares the state of agriculture in Africa to other parts of the world.

Figure 1: Growth Rate in Total Agricultural Production Per Capita in Different Regions



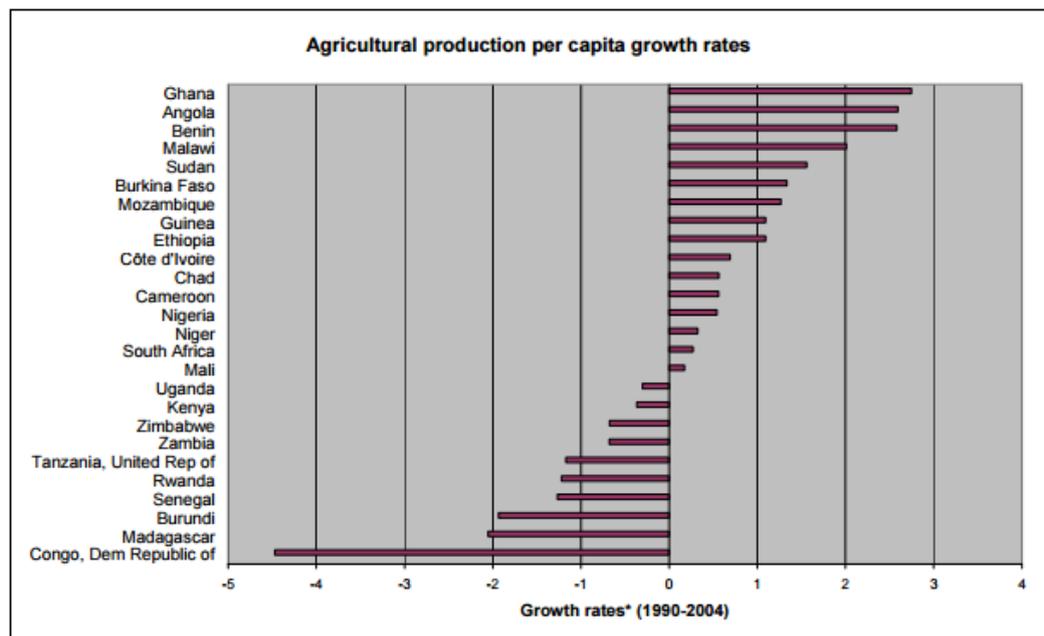
Data Source: FAO, FAOSTAT

The above diagram reveals that SSA & South Africa have not recorded significant growth for total agricultural production per capita for the period under consideration when compared to its peers. The periods show there has rather been a decline over the period (see 1961-04 and 1975-90). Literature has shown that, this declining trend is evident in food production per capita (Wik, Pingali & Broca, 2008). Other parts of the world have kept up with population growth except for Africa where food production per capita has fallen over the last four decades. Due to this, there seem to be a view that SSA cannot feed itself despite its fertile lands and must import lots of food and/or rely heavily on food aid (Kariuki, 2011). With a few exceptions, this phenomenon is not unique to one country but applies to many countries in Africa.

In addition, it is empirically established that Africa constantly records low yields with its vast uncultivated lands. This suggests agriculture in Africa is highly underdeveloped and calls for change. Stated differently, Africa has 25 percent of the

world's arable land yet produces only 10 percent of global agricultural output (Kariuki, 2011). Obviously, this depicts the underdevelopment of the sector in Africa. However, Wik, Pingali & Broca (2008) argue that several Africa countries like Ghana, Angola, Benin, and Malawi have a promising future. Consider the figure below.

Figure 2: Growth Rate in Agricultural Production Per Capita in Africa by Country



Data Source: FAO, FAOSTAT 2006 *Three-year floating average

From the diagram, some countries have shown a promising trend in terms of their growth rates in agricultural production per capita. Ghana is a typical African country with a potential for a strong agricultural performance yet, it is obvious this potential remains untapped.

According to Breisinger, Diao, Thurlow, & Hassan (2011), agriculture was a key area that historically contributed to Ghana's GDP growth and employment and enjoyed above-average growth economy-wide in the past but has recently lost steam. The Food and Agriculture Organisation (FAO) Report for March 2015 equally affirmed that agriculture is a key sector for Ghana's economy employing almost "half of the national labour force."

Notwithstanding the positive potential for agriculture in Ghana, the sector still remains “largely rain-fed and subsistence-based with rudimentary technology used to produce 80 percent of total output” (FAO, 2015). The main system of farming is traditional which involves hoe and cutlass as tools mostly used (MoFA, 2016). Some scholars have argued that governments over time have de-emphasized the primacy of agriculture and failed to assign the brightest minds and leaders to develop the sector.

Ghana has certainly not been immune from this unfortunate trend. Therefore, it is not surprising that the agricultural sector in Ghana has been declining in recent times given its reliance on outdated technologies and weak/poor leadership. Hence, there is the need for analysing trends in agricultural productivity in Ghana to provide direction for effective policing and decision making. This could help revitalised Ghana’s agricultural sector. In fact, this is true for all other African countries that have a bright future in agriculture as far as productivity is concerned.

One way to examine this productivity performance of sectors is to do trend analysis or sectoral analysis. Trend analysis is a specialized form of a single degree of freedom comparisons often with a quantitative independent variable (Meyers, Gamst & Guarino, 2006). For example, not also can investigations be carried out to find out what has happened with respect to general agricultural sector productivity over the period under review in a country but productivity studies of the various sub-sectors of agriculture can be carried out as well to identify their influence on aggregate productivity.

However, there are many existing studies on total factor productivity and this study is not intended to focus on that but on trends of productivity for the period under review. Hence, this study will gather the stories or causal views behind trends over the period through both quantitative and qualitative data on the topic.

1.1.1 Background to the Study

This research attempts to investigate trends in productivity of the agricultural sector in Ghana. Ghana was chosen because it has been established that agriculture will remain as mainstay sector for the growth of Ghana (Breisinger, Diao, Thurlow, Yu & Kolavalli, 2008 & Diao, 2010). Analysing trends in Ghana's agriculture productivity is vital since current yields are well below the achievable yields for most staple crops in the country and other sectors of the economy are also struggling (MoFA, 2007a).

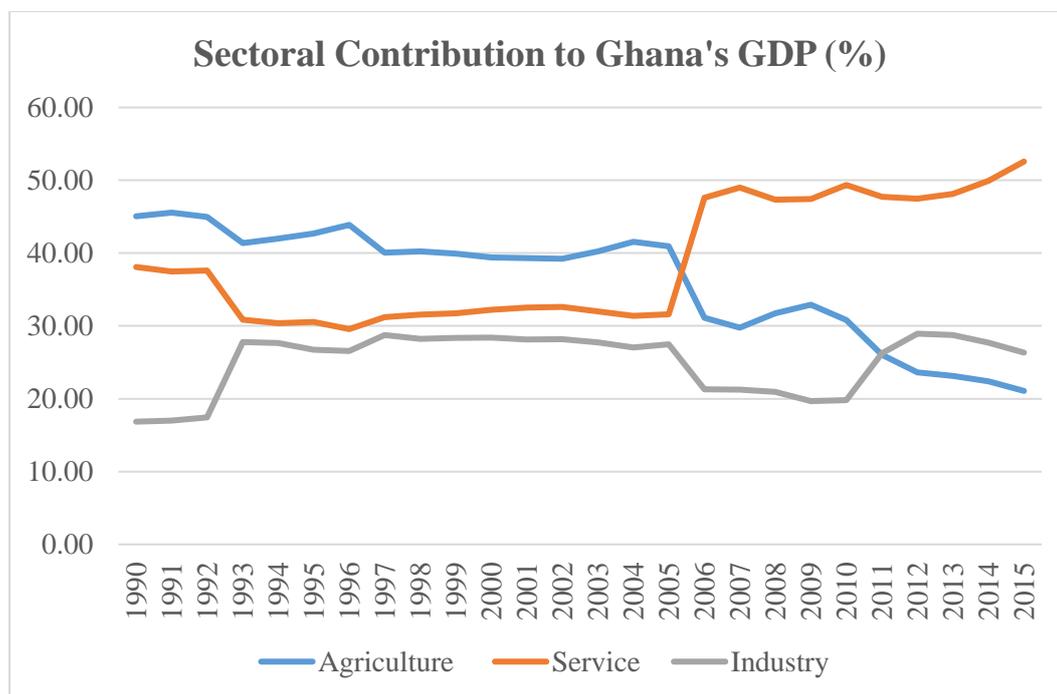
Ghana is, therefore, a key candidate for this study not just because of its current performance in the agricultural sector but also because it has become a frontrunner in the African Green Revolution process and remains as an example for other African countries (Breisinger, Diao, Thurlow, & Hassan, 2011). Fitzgerald-Moore and Patrai (1996) explains that "the Green Revolution was the technological response to a world-wide food shortage which became threatening in the period after WWII". The Green Revolution used effective technology and innovative farming practices to help change farming practice in many parts of the world especially in Asia.

Ghana is a country in West Africa renowned for its political stability in recent times but whose economic performance story has been varied (Armah, 2016). Currently, Ghana is not considered food insecure but recent challenges in the agricultural sector which has been declining with sectors like the broiler industry and staple production hardest hit raises many concerns. At independence in 1957, Ghana's prospects were bright due to its reserves of diamond, bauxite, gold, timber as well as rich and fertile lands, establishing it as the world leading cocoa producer (Wiggins & Leturque, 2011). Despite its resources, Ghana has performed below expectations compared to its peers at independence (Armah, 2016).

Notwithstanding the significant gaps in Ghana's infrastructural needs and poor performance in some sectors as well as its electricity challenges, Ghana has enjoyed some success compared to other Africa nations (Breisinger, Diao, Kolavalli, Al-Hassan & Thurlow, 2011). Though its economic growth has slowed in recent times, Ghana has reduced poverty, elevated to a lower middle income country and aims to become a middle-income country in the next ten years (Diao, 2010).

Nevertheless, Ghana has enjoyed consistent, moderate real GDP growth over the last two decades. Yet, it is not possible, however, to tag Ghana's agricultural sector as a success. Despite the country's progress, there are still many challenges to be rectified if the Ghana can achieve its goal of becoming a middle-income nation. Consider the diagram below.

Figure 3: Sectoral Contribution to Ghana's Gross Domestic Product (%)



¹Data Source: World Bank Data

¹ Note that although some scholarly publications use data from Ghana Statistical Service, this study uses data from the World Bank WDI's. This is because data was unavailable from Ghana Statistical Service and attempts to get it failed. The World Bank WDI's values are available and can be verified on its website.

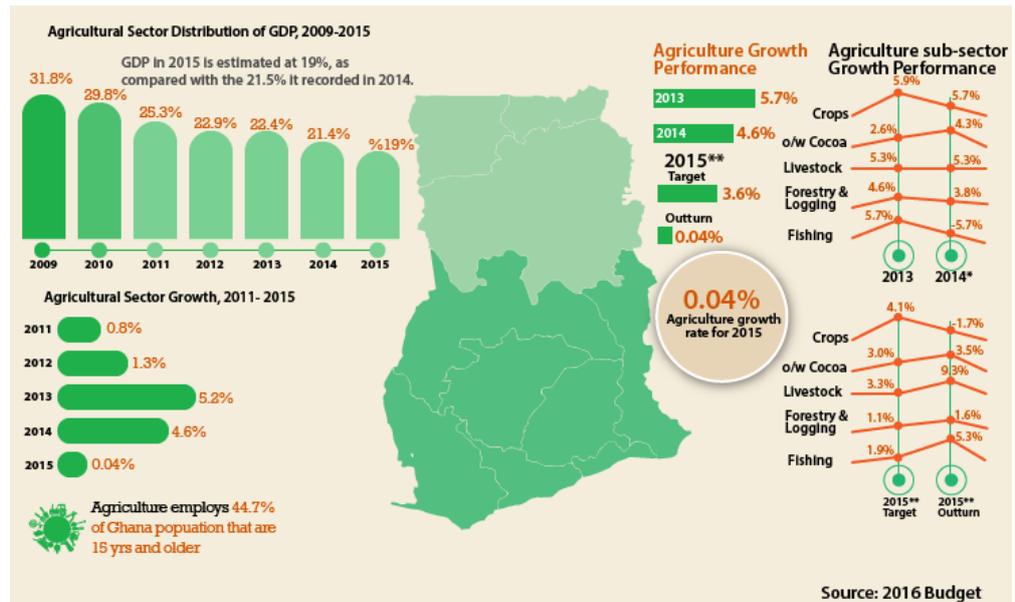
From the above graph, it is evident the agricultural sector was the leading contributor to Ghana's GDP from the 1990's until around 2005 when it lost it to the service sector. It subsequently fell to the industry sector after 2010 and is now the smallest sector despite being still the largest employer (MoFA, 2016). This development seems to be a novel phenomenon and runs counter to the predictions of some historical models in economic development that predicts a transformation of the typical economy from agriculture led to manufacturing led and then finally to service led in the maturation process.

Although this agriculture to service sector dominance is relatively recent, it seems to be typical of other developing African countries and much different from the story in Asia where India, China, and the Asian tigers all followed the traditional model. The current performance of the agricultural sector in terms of its share to GDP and productivity levels leaves much for enquiry especially in this era where food insecurity is a phenomenon for all to be mindful of as the agricultural sector stalls.

Available data from GSS confirms the trend shown above and necessitates change but it seems the Ministry of Agriculture MoFA is in self-denial of the reality in Ghana's agricultural sector. Ghana's MoFA issued a statement to counter the observed trend by indicating that the perceptions of the sector being in a deplorable state is untruth and "unscientific" (MoFA website, 2016).

However, a close look at available data indicates the agricultural productivity in Ghana declined in 2007 and has since, inched at a decreasing rate (MoFA website, 2016). One key enquiry is whether the current levels of productivity would be sufficient considering the rate at which Ghana's population is growing. The diagram below shows the current state of the agricultural sector.

Figure 4: Agricultural Sectoral Distribution to GDP from 2009 – 2015.



Source: Budget Statement, 2016

The main sub-sectors under the agriculture sector are crops (including cocoa), livestock, fishing, forestry and logging (GSS, 2016 & MoFA, 2016). Crops include industrial crops (cocoa, oil palm, etc), starchy staples, cereals and legumes, fruits and vegetables. Livestock includes cattle, sheep, goats, pigs and poultry. It is worth knowing that the crop sub-sector is the largest of all the sub-sectors (GSS, 2016 & MoFA, 2016).

The above diagram confirms the declining rate of the agriculture sector as shown by figure 3. It reveals that sectoral growth has not been consistent. From 0.8 percent in 2011, it moved to 5.2 percent in 2013, decreased to 4.6 percent in 2014 and contracted to 2.5 percent in 2015 (GSS, 2016). A critical look at the main sub-sectors reveals that except for livestock, growth rates have been declining in sub-sectors like fishing, cocoa, forestry and logging since 2012 and for crops since 2013 (GSS, 2016). It presupposes the sector could do better if certain adjustments are made to uplift the various sub-sectors.

Ghana still imports 70 percent and 15 percent of rice and maize respectively despite available land and labour to produce enough for the country. And the

increasing urban growth rate in Ghana is expected to increase the demand for food (Darfour & Rosentrater, 2016). Donkor et al. (2013) found that domestic poultry farmers in Ghana supply only about 10 percent of poultry demand in the country. That means, the remaining demand is catered for by imports. Indeed, globalisation has widened the available options for all populaces especially economies with emerging markets (Donkor et al., 2013).

Furthermore, Ghana is almost becoming a country in which people are dependent solely on imported food which does not bode well for food security. What even makes the scenario frightening is that, the rate of decline in the agricultural sector is greater than the rate of slight increases in the service sector. That is, though the service sector's contribution to GDP is rising, it is not enough to reimburse for the decline in the agricultural sector. Put differently, the service sector is rising but the growth in GDP has not seen much change in recent times and validates the assertion by some scholars that the agricultural sector will continue to play a key role in the growth of Ghana's economy (Breissinger, et al, 2008 & Diao, 2010).

In most instances in a historical and worldwide context, though the agricultural sector may be falling, the overall economy gets boosted due to compensation from other major sectors which the agricultural sectors feeds. However, this seem not to be the case for Ghana. Given Ghana's population of over 27 million people growing at more than 2.4 percent per annum (World Bank, 2015) raises concerns on demand for food, raw materials, especially as Southern fertile land is coop-ted for real estate (Armah, 2016).

It is worth knowing that agriculture serves as the input to complex value chains in both the food and manufacturing industry. So, there are large wholesalers, retailers, and manufacturers in the agriculture sector in the developed world. Apart

from the farm, there are transportation companies, storage companies and elevators, processors, manufacturers, distributors, and retailers involved in the agriculture sector (Boehje, 1999).

However, in Ghana as in other African countries, several players on the higher end of the value chains like storage companies and elevators, processors, manufacturers, distributors and retailer are non-existent. The farm sector is often directly linked to “small open market retail markets” by the farmers themselves or by middle men and women merchants. The small scale of farm operations and the increasing population suggests food insecurity is a possibility in the future indicating that there is the need for studies that draw insights from past trends in agriculture productivity to sharpen policy direction, implementation and increase food production.

1.2. Description of Research Problem

A World Bank Report in 2013 indicated that Africa earns 24 percent of its annual growth from farmers and their crops. In the same report, agriculture and agribusiness together are likely to command a US\$ 1 trillion by 2030. Given the rate at which Africa’ population is growing, is the current agricultural productivity sufficient? With a focus on Ghana’s rising population, will its current sector performance be sufficient or a threat to food security? What are the challenges to policy direction and implementation that historically plagued the agricultural sector of Ghana? What are the trends in agricultural outputs and what were the causes? These questions, among others, indicate the problem with Ghana’s declining agricultural sector and raises a need for research into the area to provide options for change. A part of the inquiry is whether Ghana can learn from other countries that have successfully advanced their agricultural potential.

The need for urgent research is necessary if Ghana's agricultural sector is to experience notable change. It could be argued that, many decisions in most developing countries are often taken without much reliance on data or research. Though not proven, there is evidence that decisions taken based on research studies or observations have resulted in great outcomes. If Ghana's agricultural sector will advance, then, it must commence with studies focused on agriculture. It is expected that the outcome of this study will present answers to the above highlighted questions and contribute greatly to changing the agricultural sector in Ghana.

1.3. Research Question(s)

To analyse the trend of agricultural productivity for the period under review, the study will focus on the following research question(s);

1. What has been the trend in the productivity of the overall sector and the various sub-sectors over the years?
2. What are the causal factors for the booms and declines of the sector?
3. What has been the effect of initiatives and policies towards agricultural productivity in the past?
4. What best practices or lessons can Ghana learn from the analysis of its historical trends in the agricultural sector?
5. What recommendations are needed to transform Ghana's agricultural sector?

1.4. Research Objective(s)

With the above questions in mind, the study seeks to provide answers through the following research objectives.

1. To identify the trends of the overall agriculture sector and its sub-sectors over the years under review.
2. To determine the causal factors responsible for the changes within the sector.

3. To describe the extent to which policies and agricultural related initiatives have been in Ghana.
4. To draw on best practices or lessons from other countries that have advanced in agricultural productivity.
5. To outline options for sustainable growth based on lessons from the history of the agriculture sector.

1.5. Research Motivation and Relevance

The significance of agriculture to Ghana's development necessitates the need for this study. Studies of this nature help to address persisting challenges that cripple Ghana's development. Stated differently, Ghana needs to learn from its past first, if policies are to be outlined for its agricultural sector to improve. It is expected that drawing insights from the past through trend analysis of the agricultural sector and its components would clearly help find effective options for development of agricultural productivity in Ghana and beyond. Many reports have projected Africa to be a continent of numerous opportunities with respect to population, agriculture, etc. but the continent is yet to fully utilized these potentials that other continents do not have presently.

The author believes the time for acting is now and Ghana and Africa at large must rise to research broadly on key areas to propel its growth moving forward. This is one way to help Ghana and Africa capitalize on its competitive edge over its peers. Ghana has enormous opportunities in the agricultural sector and would be well placed to give its best with studies of this kind. To be specific, it is expected that, the analysis of the individual sectors of the agricultural sector will provide unique insights for change and development.

In addition, the study will contribute significantly to existing body of knowledge and benefit relevant stakeholders like Ghana's Ministry of Food and

Agriculture, agriculture focused companies, investors and individuals. For individuals, the findings will help expose them to existing opportunities and may serve as an incentive for some people to invest in the sector more. For agriculture-focused companies and investors, this study will provide the needed information for decision making. For MoFA, the study will provide direction for prioritization and policy. Finally, the findings of the study could be useful to other African countries especially those of West Africa origin and beyond.

1.6. Organization of Study

This study is organized as follows. It starts with the Introductory Chapter which gives an Overview of the topic, Background to the study, Research Problem, Research Question(s), Research Objective(s), Research Motivation and the Relevance of the Study. The next section is Chapter 2 and it presents literature Review of the Study. Chapter 3 follows with the methodology which outlines; Research Design, Strategy, Techniques and Sample Sizes used in gathering the data and analysis of it. The Chapter 4 contains a detailed analysis of the data gathered and findings and Chapter 5 summaries, concludes and present options for sustainable transformation of the agriculture sector in Ghana.

1.7 Research Limitations

Below are the limitations of the study;

1. Values of the data used from the World Bank are slightly higher or lower than the values recorded by GSS where available. Hence, the results found cannot be generalised and said to be the ultimate outcome.
2. Due to financial and time constraint, the study was only limited to Ghana's capital region – Greater Accra Region. This is because, there are more agricultural focused companies in Greater Accra and more experts live in the region.

3. The sample size was limited to 12 experts due to difficulty in securing interviews and time constraints.

CHAPTER 2: LITERATURE REVIEW

2.1 Existing Evidence on Productivity

Productivity growth, especially in agriculture, is a key area or focus for any developing economy because it is one of the fundamental pre-requisite for economic growth. Aggregate productivity is the amount of output gained given the levels of inputs in an economy or a sector (Fulginiti & Perrin, 1998). A higher productivity for a country typically translates into larger income streams for nations. Due to its prominence, productivity growth in general and in agriculture has been one of the major areas for intense research since agricultural sector is essential in many developing economies (Coelli & Rao, 2005).

From literature, productivity measurement in agriculture is often sub-divided into partial or total factor productivity measurements. Analysing agricultural productivity levels and growth have expanded significantly with different techniques (Coelli & Rao, 2005). For example, Coelli and Rao used DEA approach to assessed growth in total factor productivity of 93 developed and developing countries in 2005 and found productivity to be low in developing countries compared to the developed countries.

Nin et al. (2003), Trueblood and Coggins (2003), Suhariyanto et al. (2001), Ball et al. (2001), Chavas (2001), Wiebe et al. (2000), among others respectively used DEA, DEA, DEA, Fisher (EKS), DEA through CDP function to analyse agricultural productivity levels in less develop countries, Asia, Africa and different countries of the world. Lusigi and Thirtle (1997) analysed agricultural productivity for 47 Africa countries using DEA and found productivity to be low and declining in some countries of which Ghana was one. This confirms the evaluation by Coelli and Rao (2005) as mentioned earlier. From the above examples, many works in agricultural productivity have already relied greatly on techniques like data envelopment analysis

(DEA), Cobb-Douglas production function, etc. or mainly as quantitative data research to analyse agricultural total factor productivity.

It has also been argued that studies on productivity growth in the agricultural sector help to compare the agricultural output to rising population in a country (Coelli & Rao, 2005). This provides an opportunity to gauge the vulnerability of the country to challenges of food security, food inflation, poverty, and welfare. Diao et al. (2007) found that, “agriculture is often found to be more important in developing countries” mainly because small family farms dominate such agricultural sectors. Further, according to renowned economist; Jeffery Sachs “the first step out of rural poverty almost always involves a boost in food production to end cycles of famine” (Sachs, 2006). Productivity growth in agriculture is thus fundamental for kick starting and sustaining development.

Development experts and Agricultural Economists have over the years investigated the main sources of (agricultural) productivity growth in different developing countries with respect to specific intervals or periods. For example, Alauddin, Coelli and Rao (2005) did impressive work on this between 1970 and 2000. The determinants of productivity growth, tangible and intangible as well as variations given the context has been of particular important historical interest to developing countries struggling to grow. Constantly, the pace of regular assessment of sectors for measures to advance economies is rising.

Notwithstanding that much scholarly work has been done on agricultural productivity, much of it has been focused on developed economies. Only a few researchers focused on developing economies of Africa or on specific factors in Africa. As Coelli and Rao (2005) puts it, many of these studies used cross-sectional data on countries to estimate Cobb-Douglas production technology using regression

methods that focuses on impact of specific factors. Even the few ones that have focused on Africa have a recurring theme of African countries having a technology regression while the developed economies have technology progress (Coelli & Rao, 2005).

Fulginiti and Perrin (1997) in studying 18 Less Developing Countries (LDC's) found that 14 of them indicated a decline in agricultural productivity from 1961 to 1985. Such results, some researchers have argued, indicate a divergence in agricultural productivity and appear to be in sharp contrast to GDP level productivity which shows signs of convergence (Coelli & Rao, 2005).

In Ghana, Diao (2010) found that Ghana's agricultural sector will continue to play a significant role in the economy given its size. Hence, even with a much higher growth in the non-agricultural sector, agriculture will still play a leading role. The same study further highlights that, Ghana's domestic industry and services sectors can "only grow with income growth for many households and rapid urbanisation" (Diao, 2010). This means growth in industry and services are results of a broad-based growth of which agriculture is key. This confirms what renowned scholar - Jeffery Sachs, have already indicated that no poor country that limits agriculture can hope to sustainably reduce poverty (Sachs, 2006). This implies that even with Ghana's rising population which may mean more people would still be employed in the agriculture sector, it will not unleash its potential if studies like this are not conducted to guide policy direction and sustainable development in the sector.

Moreover, lessons from the transformation of the Asian Tigers have indicated that as economies develop, the agricultural sector contribution to GDP declines as manufacturing and service sectors expand (Benin, 2016). Diao's (2010) studies sought

to find out whether Ghana's experience will be same as the Asian Tigers. His work focused on questions like will Ghana become like the Asian Tigers? Can Ghana transform its agricultural sector as the service take over as the leading segment of the real economy?

Diao's empirical studies which used a Dynamic Computable General Equilibrium (DCGE Model) found that, Ghana's agricultural sector will continue to play a significant role as the country develops over the next ten years. It equally found that agriculture has played a significant role in reducing Ghana's poverty and would continue to play such role in the future. Other studies found agriculture growth in Ghana has not been due to any green revolution growth model (productivity-led). Ghana's agriculture growth has been driven by area expansion though the potential for a green revolution exists (Breisinger et al., 2011).

2.2 Theoretical Approaches of Measuring Agricultural Productivity

Agricultural productivity has always remained a key area for critical assessment mainly because, agriculture serves as the backbone to many developing countries in Africa. According to Odhiambo, Nyangito and Nzuma (2003), factors such as technical change, relative product prices, input use, education, agricultural research and extension, market excess, availability of credit, weather, farm production policies, land ownership patterns, among others often constitute the factors considered to be important in determining agricultural productivity in Africa.

Works on agricultural productivity can be broadly classified into two groups namely theoretical and empirical. Odhiambo et al (2003) points out that, theoretical framework defines productivity and its determinants more thoroughly and set relationships for estimation. It often involves setting hypotheses that are possible to be tested empirically. However, the empirical framework on the other hand examines

trends over time and quantifies impacts of specific inputs, policies, productivity enhancing factors, technologies, just to mention a few.

According to Kelly et al. (1995) there are categorization of productivity work in agriculture namely “macro”, “messo” and “micro” studies. They assessed that, the macro studies use time series data at the national level while that of messo makes use of national data disaggregated into farm types whether small or large, administrative regions, etc. (Kelly et al., 1995, Odhiambo et al., 2003). Micro studies on the other hand uses cross-sectional data for comparative analysis across different sub-regions at a point in time. Since this study is focused on trends, this aspect would not be detailed but an overview of approaches for measuring productivity would be outlined.

2.2.1 Technical Progress

The technical approach involves the change that takes place in output growth due to other factors rather than the “conventional defined inputs” (Odhiambo et al., 2003). In many cases of capturing the effects of change an output, the production function framework is often used. Simply put, the production relationship of output depends mainly on capital and labour. Hence, an increase or decrease in either capital or labour or both reflects directly on the total outcome at a period.

2.2.2 Productivity Growth

The productivity growth approach is closely related to the above technical approach. Odhiambo et al. (2003) explains the productivity approach “as a measure of the increase in output that is not accounted for by the growth of production inputs”. It is worth noting that under this approach, productivity is usually measured by an index of output divided by inputs. Literature has shown that, two measures of productivity are regularly used; the partial factor productivity (PFP) and total factor productivity (TFP) as raised earlier. The PFP is simply the ratio of output and any one of the

inputs, typically labour or land. Though the PFP is commonly used, literature has shown that it has a weakness of not capturing or controlling for other inputs (Odhiambo et al., 2003). Due to the weakness expressed above, the TFP was offered to measure output per unit of total factor inputs. Hence, total factor productivity measures productivity by accounting for other factors of output growth like land, labour, just to mention a few. Odhiambo et al. (2003), have indicated that most analyses of agricultural productivity have been undertaken using the TFP approach.

2.2.3 Efficiency Approach

According to Sadoulet and Janvry (1995), the comparison of an observed and optimal values of an output and input of a production unit constitute the efficiency approach. It is often evaluated by “the ratio of maximum potential output obtainable from a given input or the ratio of the minimum potential to observed input required to produce the given output or some combination of the two” (Odhiambo et al., 2003). Per this approach, a country/company is inefficient when given its level of inputs, is not producing the maximum output possible or given its output, it is using more inputs than required. From this approach, efficiency is closely related to productivity. Hence, any changes in productivity is due to differences in production technology or differences in efficiency of the production process, place or environment in which the production takes place (Grosskopf, 1993; Odhiambo et al., 2003).

2.3 Trends in Agriculture Productivity in other African Countries

Fostering higher agricultural productivity and accelerating agricultural growth are noted to be core strategies for overall development of Africa (Benin, 2016). A study by Benin (2016) reveals that majority of Africa’s poor and malnourished population depends significantly on farming. Therefore, strategies that foster higher agricultural productivity or accelerates agricultural growth could be keen to reducing poverty, hunger as well as advance economies in Africa. However, as highlighted earlier, agricultural growth in Africa lags

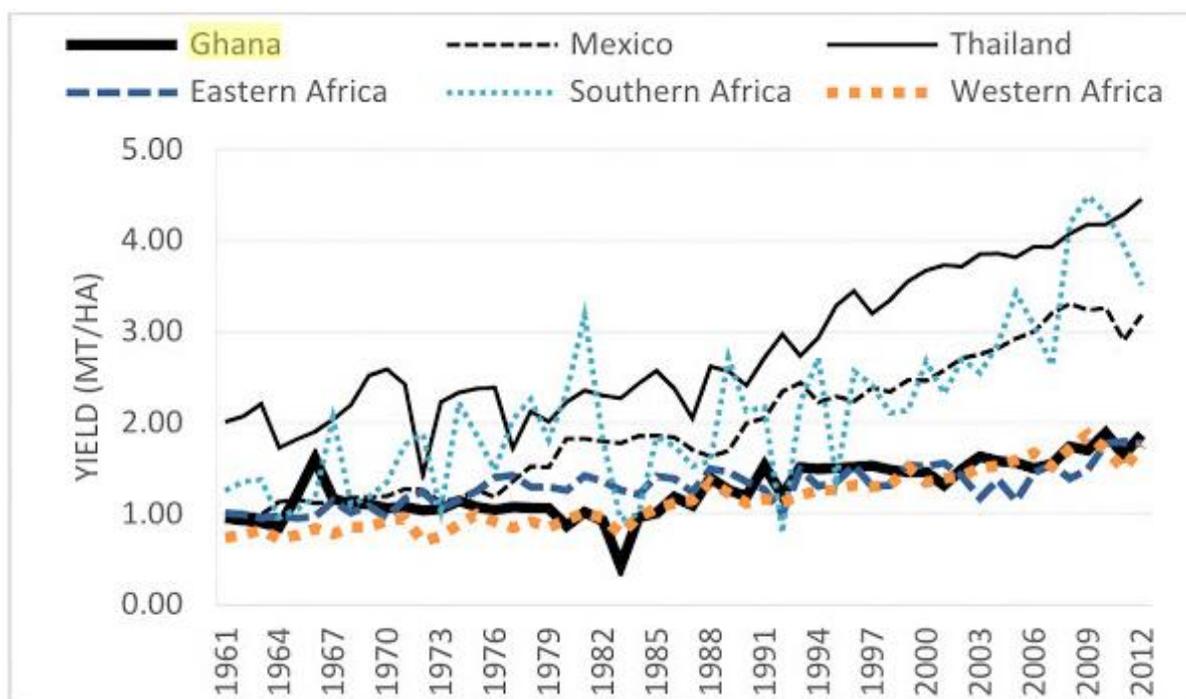
behind overall economic growth and Africa's agricultural performance has fallen when compared to that of other developing continents of the world (Benin, 2016).

Fortunately, agricultural productivity in Africa increased at a moderate rate between 1961 and 2012 (Benin, 2016). Notwithstanding that, there have been variations in the rate of growth especially in total factor productivity depending on which country it is and the region. Benin (2016) explains that "differences in input use and capital intensities in agricultural production" in various farming systems and agricultural productivity zones have affected advancements in technology.

Though productivity embodies different components, changes or trends in productivity could stem from a range of direct and indirect factors when trying to achieve development objectives. Yet, it is not clear which approach is best for Africa in the area of agricultural productivity. For instance, the Asian Green Revolution model which combines high-yielding cereal varieties, fertilizer and intensive use of labour is still under investigation whether it is a viable model for Africa (Benin, 2016). Several recommendations have been suggested by research but no specific model has been discovered as the best fit all for African countries.

A study in Kenya shows that, generally, agricultural productivity has improved in the last decade but not enough to attain food security and poverty reduction (Kibaara et al., 2009). The study revealed that Kenya's maize productivity (9 bags/acre) is ahead of other countries like Tanzania (4 bags/acre), Uganda (7 bags/acre), Malawi (7 bags/acre), among others. Yet, South Africa is ahead of Kenya and other Africa countries with 13 bags/acre (Kibaara et al., 2009). Comparing these countries to Ghana reveals as one of the lowest maize producers in the world, much lower than the average of other countries in Africa (Ragasa, Chapoto, & Kolavalli, 2014; Obeng-Ofori, Opare, & Agyei-Ohemeng, 2014; MoFA 2012). This low productivity as raised earlier is clearly depicted in figure 5 below.

Figure 5: Comparison of maize yield in Ghana to yields in selected countries and regions (1961-2012)



Source: FAOSTAT

In addition, Kenya is renowned in coffee production with 214kg/acre and ahead with 4,507 kg/acre in tea production when compared to countries like Malawi (3,523kg/acre), Uganda (2,601 kg/acre), Tanzania (2,348kg/acre) and Ghana (1,464 kg/acre) (Kibaara et al., 2009; MoFA, 2016). Notwithstanding these successes, Kenya still lags behind in sugar cane production with 25 tonnes/acre as against countries like Malawi with 43 tonnes/acre and Sudan with 42 tonnes/acre (Kibaara et al., 2009). Its dairy sub-sector has also advanced in productivity when compared to the infant dairy sub-sector in Ghana. Overall, Kenya seems to be doing well in agricultural productivity but more could be achieved with relevant resources and good practices given the potential of agriculture in Africa.

2.4 Agricultural Productivity in Ghana

In a study entitled “Economic Importance of Agriculture for Sustainable Development and Poverty Reduction: Findings from a Case Study of Ghana”, Xinshen Diao (2010) posed and answered two agriculture specific questions. First, given the outcome of many Asian countries in which share of agriculture declined in their quest to develop, Diao sought to find out whether Ghana’s story will be same

given that the country is aiming to become a middle income in next ten years.

Secondly, Diao assessed the significance of the role of agriculture in Ghana in its new development agenda for the future.

Overall, Diao's study is a detailed analysis of Ghana's agriculture sector, its impact in the past especially its contribution to poverty reduction and what impact the sector would create moving forward. Diao (2010) used forward looking approach by applying a DCGE model to series of possible growth scenarios with respect to the past and future. Diao found that agriculture will continue to play an active role in the economy of Ghana now and in the future.

Per Diao's findings, rapid growth is expected in the non-traded industry moving forward yet, this anticipated growth will not be enough to outweigh the significant role the agricultural sector is playing now and the impact expected in the near future. It was emphasised that broad-based agricultural development is key for transformation in Ghana if the country is to meet the new Millennium Development Goals to advance.

Diao's analysis reveals that, crop production or the crop sub-sector is the most important sector or activity of many households in rural areas as it serves as an income generating activity and as a source of income. The study indicates crop production estimated in total income has been reducing between 1992 and 2006 though agriculture provides "more than or close to 50% of total income for most rural households" in Ghana (Diao, 2010).

A further consideration of household surveys indicates non-farm employment opportunities are still limited in many rural communities in Ghana. This underscore why agriculture, which employs a majority of rural dwellers, ought to be transformed

to create more jobs for many. Diao's findings also revealed that further poverty reduction efforts must be on regional income gaps between the North and Southern part of Ghana.

In a nutshell, it is evident much work has already been carried on agricultural productivity in Ghana and Africa at large. This study is, therefore, a continuation in that regard but with focus on analysing the trends in the agriculture sector to outline causal factors and options for sustainable growth in Ghana's agriculture sector.

CHAPTER 3: METHODOLOGY

3.1. Overview of the Method Section

This chapter of the study outlines how the study was undertaken. It provides information on the research design, scope, population, sampling techniques, sample size, data collected, its limitations and the ethical consideration during the study.

3.2. Research Design

A research design is basically “the general plan of how you will go about answering your research question(s)” (Mark, Philip, & Adrian, 2012). In other literature, it is described as the framework used for collection and analysis of the data (Bryman, 2004). This study is an exploratory and descriptive type. It is exploratory research because part of the study seeks to outline options for the sustainable growth of the sector under review or to find out causes and options for growth in the sector.

On the other hand, it is a descriptive research because part of the study aims at depicting and analysing the trends in agricultural productivity for the period under consideration. The nature of the study necessitated the usage of both quantitative and qualitative types of data for it. The primary data was gathered through in-depth interviews with lecturers who teach agricultural courses, directors of agriculture institutions, chief executive officers, farmers, and workers of agriculturally focused organisations. The secondary data was gathered from the World Bank WDI's, Ghana Statistical Service, Food and Agriculture Organisation and online journals.

The World Development Indicators (WDI) is the primary World Bank collection of development indicators and compiled from officially-recognised international sources. It presents most current and accurate global development data available. The Ghana Statistical Service is the official national organisation mandated for conducting various censuses, surveys and compiling socio-economic data critical for management and growth of Ghana.

3.3. Research Scope

3.3.1 Study Population & Study Area

A study population refers to the “cases from which a sample is taken” (Mark, Philip, & Adrian, 2012). It is basically the target source from which a sample is selected. The target population for this study is agricultural experts with relevant working knowledge of the trends observed in Ghana’s agricultural sector. This includes lecturers of agricultural courses, chief executive officers of agricultural focused companies, directors from the agriculture ministry, commercial farmers and employees of agricultural focused companies. Time and financial constraints compelled the researcher to limit the population of interest to the Greater Accra Region.

3.4. Sampling Strategy, Techniques & Sample Size

Wister (2009) defines a sample as “the total selected set of subjects or items of whom research questions are asked or on whom hypothesis are tested, taken from the whole available population”. The sampling techniques adopted for the study are purposive and snowball sampling. Purposive sampling refers to a situation in which a researcher relies on judgment per his/her criteria to choose the sample members to participate in the study. Snowball on the other hand is a sampling technique in which sample participants are selected based on the referrals from prior participants (Trochim, 2005). These techniques were used because of the nature of the topic. The respondents include a technical director at MoFA, lecturers from the department of agricultural economics and agribusiness at the University of Ghana, commercial farmers, directors and CEO’s of agriculture focused companies. A lead specialist for Agricultural Innovations Systems at FARA was also interviewed for the study.

Finally, secondary data played a vital role by depicting the observed trend of the agricultural sector for the 20-year period under consideration. The secondary data

was mainly gathered from internet sources, academic journals and budget statements of Ghana. A sample size of twelve was designated for the study and all were interviewed in all. The twelve-people interviewed include 3 CEO's, 2 Directors, 3 Lecturers, 2 commercial farmers, one employee and one lead specialist at an agricultural research organisation.

3.5. Data Collection & Procedure

Due to the nature of the topic, the author used unstructured interviews purposely to allow him to ask open-ended questions whose wording he could easily change if need be. In addition, it was to make the interviews flexible and grant the author the opportunity to probe further on each question where clarification was needed. All the interviews conducted were based on a one-on-one in-depth interview approach. Formal letters from Ashesi University College were sent to institutions and the persons to be interviewed for approval before the interviews were conducted with the permission of the interviewees.

3.6 Data Collection Instrument for the Primary Data

As raised earlier, in-depth interview guide was the main instrument for the qualitative data collection. The author designed open-ended questions pertaining to the topic and included it in the materials submitted to the Ashesi Internal Review Board (IRB) team for approval before embarking on the interviews. Approval was granted by the IRB team for the researcher to conduct the interviews. The questions were composed to address changing dynamics in the structure of the agricultural sector, changes in output mix and quantity of output produced, observed trends in agricultural productivity, causative factors, policies in the sector and interventions for growth moving forward.

3.7 Data Analysis

Content Analysis is the data analysis method used in analysing the study.

According to Patton (2002), content analysis refers to “any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings”. It describes what had been observed and presents information from conducted interviews. It aimed at producing answers to the research questions of the study. Findings from the interviews and secondary data were used to make recommendations to accelerate growth in the agricultural sector.

3.8 Ethical Considerations

The following procedures were followed to maintain ethical integrity of the study.

- ✓ Approval was sought from any person who was interviewed.
- ✓ All interviewees were informed of the confidentiality of their personal details before interviews were conducted.
- ✓ Interviewees participation was based on their availability and informed consent.

Aside the above, the work was upheld by all the ethical standards of academia.

Identity of respondents were held anonymous and all information taken from external secondary sources were properly cited.

3.9 Limitations of Study

- ✓ There is a high possibility that interviewees from the state organisations would be biased towards either the current or previous government since they were or are employed by it.
- ✓ The time available was limited so not many other people were engaged for their views on the topic.

- ✓ Financial constraints led to some people being interviewed on phone rather than physical visits.
- ✓ Some personal and non-personal data requested were marked confidential.
- ✓ Another major limitation was getting respondents on time for the qualitative data. The bureaucratic processes of most public organisations made it more challenging as many did not respond on time.

Notwithstanding the above limitations, data collected was sufficient to produce a vigorous analysis.

3.10 Justification of the Method

Though this study is on agricultural productivity, it does not rely on the conventional approach of measuring total factor productivity but relies on in-depth analysis of the causes and options for growth in the agriculture sector in Ghana. It is valid and justifiable because it meets the objectives set out in the study.

CHAPTER 4: REPORT OF FINDINGS & DISCUSSION OF RESULTS

This chapter presents and discusses the findings of the study. It starts with a discussion of the trends in the major sectors of Ghana's real economy with emphasis on the agriculture sector. The next section is a discussion on trends in the sub-sectors of the agriculture sector. Finally, there is a discussion on causal factors identified from the responses of the interviewees.

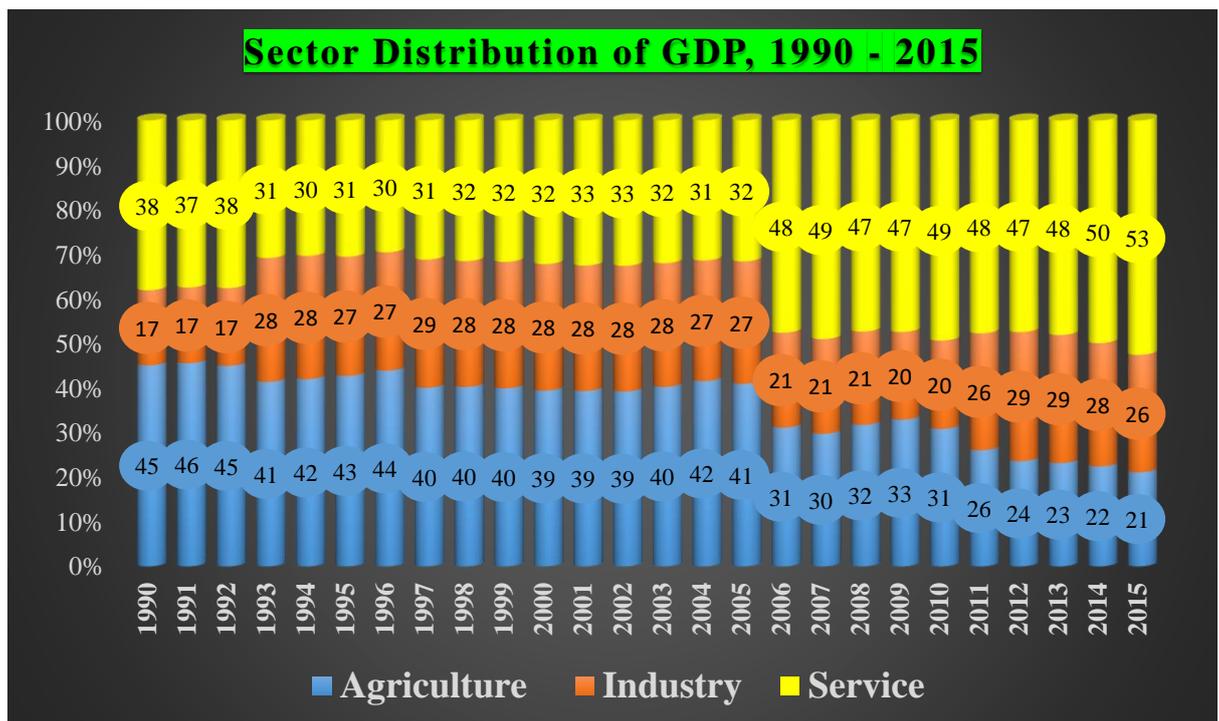
4.1 Trends in Sectors of the Real Economy - Emphasis on the Agriculture Sector

The main sectors of Ghana's real economy are agriculture, industry and service sector. Over the years, these sectors of Ghana's economy have witnessed various changes as the country develops and would experience more changes moving forward. Available data indicates that the service sector is the most significant sector in terms of contribution to GDP and employs 40.9 percent of the population (MoFA, 2016). The industry and agriculture sectors have been varying for some time now and currently employs 14.4 percent and 44.7 percent of the population respectively (MoFA, 2016).

Revised GDP estimates from GSS (2016) indicates that in 2015, GDP showed a growth of 3.9 percent over the 2014 estimates and the service sector recorded the highest growth of 5.2 percent. The agriculture and industry sectors equally recorded growth rates of 2.5 percent and 1.0 percent respectively in 2015. The service sector continues to increase its share of GDP each year and currently stands at 53.3 percent in 2015, compared to 52 percent in 2014. However, its sector's growth seems to slow down with recent growth rate declining from 5.6 percent in 2014 to 5.2 percent in 2015 (GSS, 2016). The industry sector continues to remain the least growing sector with a share of 26.6 percent to GDP. Its growth rate inched up to 1 percent in 2015 from the 0.8 percent in 2014.

Finally, the agriculture sector continues to experience declining share to GDP though it employs the highest percentage of the population (44.7%). Its share to GDP as at 2016 stood at 20.2 percent and the crop sub-sector remains the largest activity under it with a share of 15.7 percent of nominal GDP (GSS, 2016). For historical shares of the three sectors discussed, consider figure 6 below.

Figure 6: Sector Distribution of GDP, 1990 - 2015



Source: World Bank

Focusing on the agriculture sector, it is evident the agriculture sector was the leading contributor to GDP from the 1990's until in 2005 where it was overtaken by the service sector and pushed to second place. It further subsequently lost to the industry sector after 2011, becoming the smallest real sector. The fall was mainly attributed to a decline in reforestation activities which led the forestry and logging subsector to contract by 14 percent though it was the first-year Ghana recorded its first target of one million tonnes of cocoa production under the crop sub-sector (Budget Statement, 2012). The decline in 2011 was also attributed to a 30 percent cut in

budgetary allocation to the sector by government. This negatively impacted the investment activities that have been commenced in the sector in previous years.

This development, although not unique to Ghana because it has emerged in other African countries more recently, seems to be a novel phenomenon and runs counter to the predictions of some historical models in economic development. Such models predict a transformation of the typical economy from agriculture-led to manufacturing-led and subsequently be led by the service sector in the maturation process.

Examples of the transformation from agriculture to manufacturing to service took place in South Korea, Singapore and Taiwan (the Asian Tigers) and even more recently in China and India. In these two later giant Asian countries agriculture has ceded its dominant position to manufacturing with the service sector expanding and ready to take over. The consistent decline in Ghana's agriculture sector with yields below the expected levels is, however, a cause for concern given the sector employs 44.7 percent of Ghana's populace who are 15 years and above and yet its size and output growth are declining (GSS, 2016; MoFA, 2016).

In addition, a look at figure 5 above indicates that the sector has been declining continuously for the past ten years. To worsen matters, growth performance has been responding to the diminishing contribution by equally recording fluctuating growth rates in major sub-sectors as depicted in Table 1 below.

Table 1: Growth Rates of Gross Domestic Product at Constant 2006 Prices (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015*
1. AGRICULTURE	-1.7	7.4	7.2	5.3	0.8	2.3	5.7	4.6	2.5
1.01 Crops	-1.3	8.6	10.2	5.0	3.7	0.8	5.9	5.7	2.0
<i>a.w. Cocoa</i>	-8.2	3.2	5.0	26.6	14.0	-9.5	2.6	4.3	-2.3
1.02 Livestock	4.7	5.1	4.4	4.6	5.1	5.2	5.3	5.3	5.3
1.03 Forestry and Logging	-4.1	-3.3	0.7	10.1	-14.0	6.8	4.6	3.8	3.9
1.04 Fishing	-7.2	17.4	-5.7	1.5	-8.7	9.1	5.7	-5.6	1.3

Source: GSS, 2016 *Revised

Growth rate in the overall sector declined by -1.7 percent in 2007 mainly because there were poor rain falls and many lands were uncultivated. After an impressive 7.4 percent growth in 2008, the growth rate of the agriculture sector has been declining and stood at 2.5 percent in 2015 (GSS, 2016). Though not yet there, it has shown signs of rising by improving to 3.6 percent as at 2016 (Budget Statement, 2017). The crop sub-sector as indicated earlier is the “largest activity” under the agriculture sector (covers over 60 percent of the overall sector) and has a “heavy” dominance on the sector because of cocoa which has been varying in the last few years as shown in Table 1 above.

Many groups and scholars have expressed concerns about the persistent declining observation but it seems not much have changed. The crop sub-sector is of keen interest because it has a direct impact on people’s livelihood. The cultivation, sale and consumptions of cassava, maize and other food stuff consumed by Ghanaians especially those in the low-income class covers the majority of rural population. The decline in those sectors means they could be heavily impacted with negative consequences for food security, poverty, inequality, malnutrition and income security.

From the interviews conducted, many experts attributed the development of the sectors explained above to the discovery of oil by Ghana in commercial quantities in 2007. They revealed that the discovery of oil in that year began to shift attentions

of governments over the years from agriculture to the oil sector. It was established that governments neglected the agricultural sector in favour of oil in terms of resources, effective initiatives, and policies. The government looked on as fertile agriculture lands were co-opted for real estate by parastatals of the oil industry in the Western region and cocoa farming took a back seat. Also, several land owners and community leaders began to develop interest in giving out their lands for galamsey activities than for farming activities because of the rewarding nature of the former.

Although the subsequent significant drops in world oil prices clearly suggest that a return to a focus on agriculture is the smart thing to do, not much has been done through budget allocation to revamp the sector. The responses of the interviewees called for a re-focus on the agriculture sector with respect to increase in budget allocation, prioritization and linking the sector to other sectors of the economy. The current government which came into office 3 months ago seem to put the focus back on agriculture with the “one-village, one dam in the northern regions of Ghana policy”²

Furthermore, the trend in Table 1 prompted many of the interviewees to revealed that there are misplaced priorities within the agriculture sector. Many of the respondents explained that many things are being attended to at the same time without any direction. Emphasis needs to be put on specific sub-sectors with (growth potential) laudable initiatives to ensure steadfast change in the sector. “Galamsey” was also acknowledged to be a major factor contributing to the failure of agriculture

² The New Patriotic Party (NPP) government won the December 2016 elections with Nana Addo Dankwa Akufo Addo sworn in as president. The NPP promised to re-vamp agriculture with their “one village one dam in the north” policy. This involves building a dam in every village in Ghana’s northern region which is still heavily dominated by agriculture but is less fertile than the south. The NPP also promised to pursue a “one district one factory” agenda with attention to agro-industry and hope that a revived agricultural sector will be key to their flagship policies. So far, budget allocations have not sufficiently addressed the needs of the two flagship policies: “one village one dam in the north” and “one district one factory”.

sector in Ghana as acknowledge earlier. Many fertile lands in Western, Central and Ashanti regions have been given out for galamsey activities at the expense of initiatives that would propel growth in the agriculture sector.

In addition, following the declining trend observed in both the agriculture and industry sectors, many of the interviews acknowledged a lack of comprehensive linkage between the sectors. If all things were alright, the success of the agriculture sector must feed into the industry and subsequently into the service sector. It was revealed that, for the agriculture sector to do well, it must be linked to the industry sector as an input-providing sector to accelerate development in both sectors as well as the over-all economy of Ghana.

Cocoa which is a major component of the crop sub-sector needs to be given urgent attention. Also, lack of innovation systems, non-existent of technology and mechanization in the sector were noted to be contributing to the sector's decline. This has resulted in minimal change in production in the sector as well as the entire Ghanaian economy. It was also revealed that the agriculture sector is choked with many small farm holders with few large agribusinesses (MoFA, 2016) which are among the cause of the slow but steady growth experienced over the last 20 years under review.

4.2 Trends in Sub-Sectors of the Agriculture Sector

The sub-sectors under the agriculture sector in Ghana are the crops (excluding cocoa), cocoa, livestock, forestry and fisheries (MoFA, 2016). Cocoa has a significant impact on Ghana that it is almost the apple of the Ghanaian agriculture sector's eye. Ghana is the world's second-largest producer of cocoa with 21 percent of total global production. Cocoa beans from Ghana serve as the global benchmark in terms of quality and attract a premium on the international market (United World, 2016).

Breisinger et al. (2008) explained that cocoa over the years has been the main driver of Ghana's agricultural export growth. In the pre-2000 era "Ghana goes as cocoa goes" was a popular Mantra (Armah, 2007; Gyimah-Brempong, 1987). Although other sub-sectors would be discussed, the focus is on cocoa. Studies show that between 1995 and 2003, cocoa exports increased by 1.2-fold and indicated an annual growth rate higher than 10 percent. Cocoa grew rapidly between 2002 and 2006 mainly because of favourable international prices (Breisinger et al, 2008). Cocoa is one of the major crops in the agriculture sector that generates much of Ghana's foreign exchange.

As such, governments in the past have put policies in place to improve production and expand areas under cultivation. One of such major advancement in policies was when the government in 2006 outlined policies in line with the Millennium Challenge Objectives that Ghana signed in 2006 (United World, 2016). These policies were not only aimed at improving cocoa but transforming the entire agriculture sector through increased mechanisation, an improved rural economy and greater food security throughout Ghana (United World, 2016). Ghana signing the CAADP compact was also another step in the right direction to advance the agriculture sector.

Though agricultural growth has accelerated in the past, recent developments leave much for concern. Evidence available indicates that forestry and cocoa alone reached double-digit growth rates in the late 1990's and early 2000's (Breisinger et al., 2008). Available data on the sector reveals there has been modest growth in the sub-sectors. Consider Table 2, Table 3 and Figure 7 below.

Table 2: Agricultural GDP Growth & Contribution to Agricultural GDP Growth.

	1991-95	1996-2000	2001-05	2006
Growth (annual %)	2.0	3.9	5.5	5.6
Crops other than cocoa	1.5	3.4	4.5	5.8
Cocoa production and marketing	7.0	6.0	14.8	8.3
Forestry and logging	1.9	10.8	5.1	2.5
Fishing	1.8	0.6	3.0	3.6
Share of AgGDP (%)				
Crops other than cocoa	69	68	68	66
Cocoa production and marketing	8	9	10	13
Forestry and logging	7	9	10	10
Fishing	15	14	12	11
Contribution to agricultural GDP growth (%)				
Crops other than cocoa	51	60	55	69
Cocoa production and marketing	28	14	28	19
Forestry and logging	7	24	9	4
Fishing	14	2	7	7

Source: Adopted from Breisinger et al, 2008.

From Table 2, it is evident the crop sub-sector is the major component of the agriculture sector. It has been contributing over 60 percent to the overall sector since the 1990's with 66% in 2006. The fishing sub-sector becomes the next major component registering a double-digit contribution from the 1990's to 2006. Finally, cocoa as raised earlier has been significant sub-sector with improvement of its single-digit contribution to a double-digit in 2005 as well as forestry and logging which forms the least of the agriculture sector per the above table.

Table 3: Contribution of various Sub-Sectors to Agricultural GDP (at 2006 Prices).

Sub-sector	Contribution to Agric. GDP (%)									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*
1. Crops (excl. Cocoa)	60.1	61.1	62.2	64.3	62.4	63.1	63.3	63.8	64.5	64.7
2. Cocoa	9.9	9.3	8.9	8.7	10.5	11.8	10.5	10.2	10.2	9.7
3. Livestock	8.1	8.6	8.4	8.2	8.2	8.5	8.7	8.7	8.7	9.0
4. Forestry	13.6	13.3	11.9	11.2	11.7	10.0	10.4	10.3	10.2	10.4
5. Fisheries	8.3	7.8	8.5	7.5	7.2	6.6	7.0	7.0	6.3	6.2

Source: MoFA, 2016.

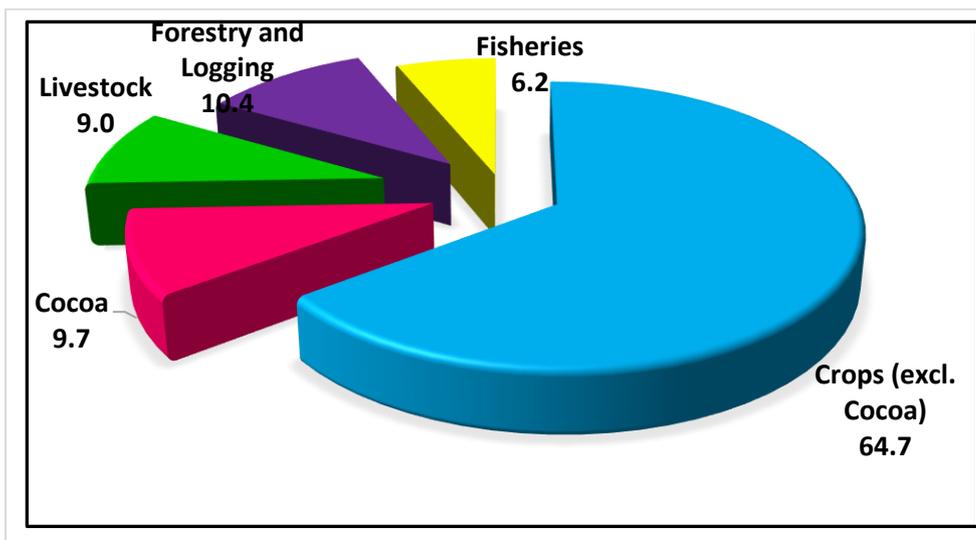
Table 3 validates the trend depicted in Table 2 by providing continuation to agriculture GDP from 2006 where Table 2 ended to 2015. Combining both tables, it

unfolds that, the crop sub-sector has declined from its 69 percent in the 1990's to 60.1 percent in 2006. Some factors attributed for this by interviewees include less attention to the sub-sector which is mainly dominated by small-scale farmers, whether conditions, inputs challenges, just to mention a few. Some of the interviewees acknowledged that though crops constitute a major share of the agriculture, farmers under it are not highly rewarded in terms of market availability and competitive prices as compared to the cocoa sub-sector.

Moreover, Table 3 also shows that the cocoa sub-sector has been declining and lost its double-digit after 2005. Hence, it has been contributing less to the overall sector up to 2010 where it revamped and gained a double-digit contribution. As highlighted earlier, some factors that caused this was due to poor rainfalls, governments giving too much attention to the discovery oil in Ghana in terms of resources and policies to the neglect of the agriculture sector especially the cocoa sub-sector.

Finally, table 3 indicates that the forestry and logging sub-sector has been improving by recording steady share to the overall agriculture sector since 2005 though it has experienced fluctuations as well. The fisheries sub-sector share to the overall has also been declining since the 1990's to a current 6.2 percent share as at 2015. The interviewees attributed the observed trend to pollution of major rivers and lagoons in the Ghana by galamsey activities, less focus on the sub-sector in terms of policies and resources as well as, other technical challenges faced by farmers in the sub-sector. Figure 7 below gives a pictorial overview of the various sub-sectors contributions based on the data contained in Table 3.

Figure 7: Agricultural GDP (%) by Sub-Sectors – 2015.



Source: MoFA, 2016, based on Table 3.

4.3 Discussion of Causal Factors

With the observations in section 4.1 and 4.2, respondents were asked to share the causal factors they deem responsible for the above happenings. Many factors were highlighted but below are the ones that run across majority of the interviewees' submissions.

4.3.1 Budget Allocation

Findings from the study revealed that budget allocation to the agriculture sector over the last few years has not been sufficient given the attention it needs. Many of the experts interviewed lamented that governments continue to allocate fewer resources to the sector compared to other sectors and this affects the outcome of the sector greatly. Drawing insights from the United States, some argued that though less people are engaged in the agriculture sector in the US, the US government regularly allocates a considerable proportion of its budget to the sector to ensure it produces well to feed its people and for exportation. One of the lecturers interviewed revealed that, currently, the US allocates 13 percent of its budget to agriculture as compared to the less than 2 percent of Ghana.

Furthermore, review of countries like Germany, Costa Rica, China and others, reveals these countries committed significant component of their budgets to finance

activities within the agriculture sectors as well as implemented laudable policies aimed at boosting their economies. Ghana must start with similar commitment as the above countries to enact specific policies to help revamp the sector.

4.3.2 Lack of “Binding” National Development Plan

Further analysis of responses from the interviewees revealed that Ghana lacks a national development agenda which has worsen activities in the agriculture sector. Though several attempts have been made in the past at drafting national development plans, it is unclear if one of such plans is in use. Governments come with its own plans and start new projects instead of continuing existing projects. Most of the time, only a few projects of a past government shall receive continuation from a new government in power. This lack of direction in the agriculture sector has resulted in a challenge where most policies and initiatives of governments are mostly undertaken to please party “faithfuls”, elites of the political ranking or party ideologies

Moreover, many governments operate “self-centredness” plans when in office instead of pursuing long-term agenda to advance the sector. This has happened regularly because many political parties in office are always mindful of the next election and their quest to win power. Henceforth, governments are often focused on drafting and implementing projects just to appeal to electorates rather than leaving a lasting impact on the sector. Even outside the agriculture sector, there have been other projects in different sectors of the real economy that have equally witness the above manipulation.

This lack of direction in the agricultural sector must end if the sector is to be revamped and made sustainable moving forward. Over the years, governments have showed interest in only activities that suits them or scores political points for them for the purpose of “next elections”. For example, the SADA initiative implemented by the outgone NDC government has been argued to be one of the projects that were

“rushed” in terms of content development and implementation but was undertaken just to score points for the government in the Northern part of Ghana. At the end, it is noted to be one of the worst projects ever introduced in the agriculture sector that has ruin state funds.

The current situation would be non-existent if Ghana had a development plan in place. Indeed, this same factor is largely responsible for the overall sluggish rate of development in Ghana when its compared to some countries. In essence, there is an urgent need for a laudable national development plan to propel governments to act in line and avoid the current situation on the ground.

4.3.3 Lack of Innovation Systems & Technology Commercialisation

It was also found that, Ghana lacks the local technology to enhance productivity in the agriculture sector. Much work under the agricultural sector was still done with outdated practices that do not yield maximum production. The innovation systems needed to enhance technology commercialisation are missing in most cases. Innovative technologies must be commercialised to reach both the subsistence farmer and the large-scale “agripreneur” whose goal is to produce more for commercial purposes.

The lack of these necessary ingredients within the agriculture sector has been one of the main argument for the less and less performance and underdevelopment of agriculture in Ghana and other Africa countries. Many of the interviewees credited it as a failure on the part of governments not to compliment research institutions and universities to showcase their innovations to farmers across the country to improve production. MoFA (2016) report shows there are 17 agricultural manpower development and research support institutions in Ghana yet not much is known about the interventions or technologies being rolled out to both small and large-scale farmers for commercial production in the agriculture filed.

4.3.4 Misplaced Priorities

In addition to the above points, majority of the interviewees expressed presence of misplaced priorities within the agricultural sector in Ghana. They indicated that though many governments have shown to be doing significant works in the sector, existence of “misplaced priorities” have caused many of such initiatives to either failed or not last for long to unleash the potential in agriculture in Ghana. For example, a lecturer at the department of agricultural economics and agribusiness at University of Ghana wondered why the current government of Ghana would indicate that, sugar canes would be planted in Northern Ghana only to be used by factories situated in Southern Ghana. This, he argued is a clear example of a misplaced priority that need to be halted. Knowing that Northern Ghana operates with one rain season, why would a government dream of planting a crop like sugar cane that needs water all the time and hope to get quality yield. To worsen matters, output harvested would have to be transported to Southern Ghana at extra cost for sugar factories there to use.

Obviously, this does not only drag development in the sector back, it also raises the cost of activities along the sugar value chain. In other words, the lecturer is arguing that, the sugar canes should be at a geographical point where it is less costly to produce (like South Ghana where there are two rain seasons) with factories present. These misplaced priorities have caused many programs commenced by governments and international partners to fail woefully.

Aside the above example of misplaced priority in the sector, other interviewees highlighted the need for key attention to be given to certain sub-sectors like cocoa, fisheries, and crops which employ most the people in the agriculture sector. Oil palm, coconut, pineapple, cashew, among others are crops that if Ghana should pay keen interest to, would generate high yields and processed to add value for commercial purposes. It was revealed that, much investment has already been put in

the agriculture sector but due to misplaced priorities, not much has been achieved.

Scarce investment funds have been spent in sub-sectors where they are not needed

most and do not have any comparative advantage to advance the overall sector.

4.3.4 Lack of Comprehensive Linkages in Sectors, Ministries & Markets

Furthermore, the outcome of the interviews revealed that there is no comprehensive linkage between the agricultural sector and other sectors of the economy. Though it is expected that the agricultural sector would feed the industry sector for effective manufacturing and processing to take place, less of that is seen in Ghana. The sectors seem to operate independently of each other when indeed, they ought to be working together to propel growth and prospects in the economy.

Many of the interviewees argued that there is the need for sub-sectors in the agriculture sector to be linked to each other. In the same way, the various sectors must be linked to effective development within the entire economy. Also, the various ministries under past and present governments seem to operate solely without connection with other ministries. Governments seem to be good at rebranding ministries but not ensuring that there is synergy between them for effective policies and decision making to advance the sector.

For example, a close working relationship between the ministry of trade and ministry of food and agriculture would help to get more produce into markets for good prices or competitive prices for farmers than allowing it to go waste due to lack of storage facilities. Hence, Ghana needs to develop comprehensive linkage between the sub-sectors in agriculture, the various ministerial bodies and the overall sectors of the economy to advance.

4.3.5 Land Regulations Within the Agriculture Sector

In modern times, Ghana has become known for exchanging fertile land for real estate activities/development or for galamsey activities which cause a reduction

in land space for agriculture engagement. Galamsey activities leave huge holes in land and chemicals (mercury) which destroy the fertility of land in the long run. The recent report of MoFA (2016) indicated that, there are 23,884,245 hectares of land in Ghana of which 56.94 percent is allocated to agriculture. Yet as at 2015, less than 48 percent of the agriculture land has been put to use (MoFA, 2016). Irrigation activities which could help areas with insufficient water seem less (only 3.44%) as reported by MoFA (2016).

To worsen matters, land owners prefer to give their land out for modern day activities rather than agriculture. There are no concrete land reforms or regulations to stop this menace which need urgent attention. Weak institutions and corruption of community leaders or chiefs were revealed to be some of the factors for the galamsey and real estate narrative. This situation has become a threat to agriculture productivity in terms of land size for commercial farming and needs to be addressed soon if agriculture in Ghana will advance to the level desired. Land reforms are, therefore, critical for this to happen and Ghana has no better time to act than now.

4.3.6 Policy Framework

Ghana by its location and geographical endowment, have seen many initiatives in West Africa piloted in it. This has given it some advantage that many experts think have not been fully utilized. For example, during President Kuffour era in the 2000's, many agriculture focused programs were implemented in Ghana and that gave rise to the establishment of prominent organisations like the FAO, AGRA, FARA, YARA Group, among others. The coming of these strategic institutions brought implied benefits to Ghana's agriculture sector.

Many policies since then, have been critical to both locals and foreigners alike due to the high potential of agriculture in the country. Even though Ghana is among the countries that have put many policies in place for acceleration in agriculture, it has

not yielded the needed results. Ghana was among the first countries to sign CAADP in Africa which calls for increase in budgets to advance agriculture yet it has not adhered to this commitment effectively.

A lot of policies on inputs such as fertilizers has not been carefully programmed to reach majority of rural farmers. The system in place seem to favour elite farmers who can afford and have access to market information as compared to a typical rural farmer in a village. There are many fertilizer supply firms and over 160 agro-processing firms (MoFA, 2016) that many ordinary farmers are unaware of. Specific policies are needed to address these challenges for the sector to function well.

Finally, the interviewees noted that not many policies on irrigation have produced significant output and need to be re-considered. Most of the policies failed because they only focused on a unit and not the entire value chain approach. Many focused on certain stages such as production without necessarily overlooking its impact on other levels or sectors. Due to this, not many value-added goods are produced under the agriculture sector. Specific policies that will propel certain areas to thrive must be enacted and implemented with the whole value chain taken into consideration.

In conclusion, Ghana as a country has put in many policies in place over the years aimed at improving productivity in the country. Some of these programs have been successful while others could be best described as “lessons” for future use. The SADA initiative, One Village – One Dam, among others are the most common ones in recent times. Notwithstanding the success or failures of these policies, more tailored interventions regarding policy framework are needed to transform the agriculture sector in Ghana and other places in Africa.

CHAPTER 5: CONCLUSION & RECOMMENDATION.

5.1 Summary

Evidence gathered through the interviews conducted indicates that agricultural productivity has been declining over the years. Production yields from major of the sub-sectors under the agriculture sector are below expectation compared to what could be achieved (MoFA, 2016). In a current study by Fayissa and Nsiah (2017) on trends in agricultural production efficiency in African countries, Ghana was identified as one of the countries that were “never efficient” and labelled “struggler” in terms of agricultural production efficiency from 1995 - 2012.

The findings of Fayissa and Nsiah (2017) confirms what literature outlined in chapter two. The above recent study also validates the evidence given by the interviewees from the interviews. Many of the experts interviewed called for enactment and implementation of specific policies, land reforms, good governance, strategic partnerships with the private sector, creating opportunities especially for the youth in agriculture, just to mention a few. Also, a lecturer from University of Ghana explained that strong policies in the agriculture sector will propel technology commercialisation and mass production to occur simultaneously.

Finally, allocating more funds to the sector from annual budgets, intensive research work as well as creating enabling an environment for strategic engagement will transform the agricultural sector. However, to avoid having ineffective policies, the government of Ghana is encouraged to develop strategic partnerships with the private sector to boost productivity and ensure they work together to sustain developments within the agriculture sector.

5.2 Conclusion

The aim of this study was to identify the trends in the agriculture sector and its sub-sectors, determine causal factors, policies in the sector and best practices or options to advanced agricultural productivity in Ghana. Reviewed literature on the topic suggested that much work on this topic often relied on methods like the DCGE model, CDPF Model, TPF, PFP, etc. for the analysis. Few works engaged practitioners in the sector to find out the causal factors for the sudden changes and possibilities for sustainable growth. To meet the outline objectives, this study followed the latter approach and interviewed practitioners in the sector.

My findings revealed that much work has already been carried by previous governments in terms of policies and initiatives to revamp the agriculture sector in Ghana. President Kuffour's era (2001 – 2008) was highly noted by most of the people interviewed as a time that most policies and initiatives were embarked on to transform the sector. It was also revealed that Ghana has become a major point of attraction for many agriculture-focused organisations in west Africa.

Notwithstanding that, many interviewees attested to the declining growth rates and abysmal performance of the sector in recent times. Majority attributed the development in the sector to factors like; less budget allocation, misplaced priorities within the sector, lack of technology commercialisation, political activities, inputs challenge, lack of irrigation facilities, among others. Although the agriculture sector is expected to diminish in terms of its contribution to GDP and the percentage of people it employs as Ghana moves from an agrarian economy, productivity is expected to be high given Ghana's vast resources and potential in agriculture. Besides that, the regular decline in productivity could have consequences on food security for Ghana.

Therefore, the timing of this study is right and relevant given that, most African countries like Ghana can leverage on agriculture to advance and liberate many from poverty. It is hoped that the above findings and the recommendations below would help transform agriculture in Ghana and Africa moving forward.

It is not enough for governments to just roll out policies and budgets in the agriculture sector, deliberate efforts must be undertaken to advance productivity in the sector, create proper market linkages with the aim of improving life for farmers and all those engaged in its value chain.

5.3 Recommendations

Based on the findings and discussion presented above, the following recommendations are outlined for consideration in a bid to propel sustainable growth and development within the agriculture sector in Ghana and other parts of Africa.

First and foremost, the government of Ghana need to develop a regulation policy on land reforms. This will help minimise or prevent the situation of exchanging fertile lands for galamsey activities or real estate development. The government is not to step in and control how individuals and community leaders should use their lands but provide a direction in which the above parties must act. This will help to secure fertile lands in some regions and regulate the exact initiatives that should be carried out on them. Research shows that, China's economic miracle began with land reforms which made it possible for individuals to lease larger lands for a longer period to enhance output (production). Also, Vietnam's recent agricultural revolution began with major land reforms and it paved way for its agriculture sector to thrive. The current complex land tenure system must be strategically tackled by government to enable private sector actors' partnership for sustainable growth and development of the sector in Ghana.

Secondly, there is the need for government to partner with universities, research institutions, technical universities, to commercialized existing knowledge, techniques and innovations for mass productivity in the agriculture sector. Much of the existing knowledge or techniques and innovations discovered by many of the research organisations are unknown to many actors' in the agriculture sector. The fact that, many small scale and large scale farmers are unaware of these innovations means, extra efforts are required to get their technologies out to the public. If adhered to, it would not only increase productivity within the agriculture sector but would create more wealth and jobs for many people. In deploring the knowledge and innovations, it is advisable, the commercialization is done by sub-sector at a time for effective monitoring and implementation.

In addition, the government of Ghana is encouraged to forge strategic partnerships especially on inputs materials to enable many farmers, have access to the needed inputs to improve productivity in the sector. The government would not be able to do everything to transform the agriculture sector but it must create an enabling incentive for private actors to step in and act. However, government must not only create the enabling environment but ensure there is a workable scheme to deliver all required inputs to farmers on time irrespective of one's location. In cases where the government could deal directly with supplying of inputs, it must act strategically to ensure sub-sectors with competitive edge are well served to ensure optimal production. The current gesture by the NPP government by importing 300, 000 tonnes of fertilizers in its 100-days of governance is a laudable step and with good distribution channels, productivity of certain sub-sectors would be advanced. Also, the failing weather conditions of Ghana must be complimented by advanced

technologies of irrigation especially in Northern Ghana where there is huge potential for agriculture but constrained by one raining season.

Finally, political leadership and development of a national plan of advancement is needed to transform Ghana's agriculture sector. Political leadership is key if the agriculture sector would experience any change. Leaders need to reason beyond party ideologies and elections and continue existing vibrant projects by previous governments if they hold an enormous potential for the sector. The tradition of starting all over new projects by every new government is not only costly but sometimes cause backwardness in growth and development. For the national development plan, Ghana must take it seriously not only for transformation of the agriculture sector but its entire economy. Issues and areas of the sector that need pressing attention would easily be outlined by a plan of that kind and help the ministry and government to function effective in the implementation of policies and initiatives needed to transform the sector and Ghana's entire economy.

Besides, these recommendations, Ghana should learn from other countries like Nigeria, Rwanda, etc. who are doing very well as far as agriculture is concerned. Lastly, it is recommended that, a further study is conducted in addition to this and others with focus on individual sub-sectors to outline specific actions to be taken to ensure sustainable growth and development within Ghana's agriculture sector.

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APPENDIX*Appendix 1: Interview Guide – For Agricultural Economists/Specialists*

1. Kindly describe your official professional position and institution. Expand on your core assigned duties.
2. Please tell me how long have you been working in the agricultural sector in Ghana?
3. Describe your understanding of the structure of the agriculture sector in Ghana.
4. Have you observed any changes in the output mix and quantity of output produced over the last 10 – 20 years and what are those changes?
5. Please describe any observed trend in the agricultural output in Ghana over the last 10 – 20 years highlighting on periods of success versus periods of decline and elaborate on causative factors.
6. What factors do you attribute the current changes [especially decline] in agricultural sector to?
7. Kindly list and describe the agricultural policy initiatives undertaken by the successive governments over the period under study that you are familiar with.
8.
 - a. Of the policies taken by the different governments which ones were effective in raising agricultural output and why and how were they effective.
 - b. Of the policies taken by the different governments which ones were ineffective in raising agricultural output and why and how were they ineffective.
9. Does effective policy direction have a role to play in what is happening in the sector now? If yes, could you please explain what exactly it is?

Appendix 2: Interview Guide – For University Lecturers (Agric. Courses Only)

1. Kindly describe your official professional position and your department in University of Ghana. Expand on your core assigned duties.
2. Please tell me how long have you been teaching in your department and what courses you teach?
3. Kindly describe your understanding of the structure of the agriculture sector in Ghana.
4. Have you observed any changes in the output mix and quantity of output produced over the last 10 – 20 years and what are those changes?
5. Please describe any observed trend in the agricultural output in Ghana over the last 10 – 20 years highlighting on periods of success versus periods of decline and elaborate on causative factors.
6. What factors do you attribute the current changes [especially decline] in agricultural sector to?
7. Kindly list and describe the agricultural policy initiatives undertaken by the successive governments over the period under study that you are familiar with.
8.
 - a. Of the policies taken by the different governments which ones were effective in raising agricultural output and why and how were they effective.
 - b. Of the policies taken by the different governments which ones were ineffective in raising agricultural output and why and how were they ineffective.
9. Does effective policy direction have a role to play in what is happening in the sector now? If yes, could you please explain what exactly it is?
10. Were there any interventions that were introduced in the past that made progress but have been halted lately? If yes, please elaborate on them.

11. Which sub-sector of the agricultural sector needs urgent attention in your view?
12. Are you familiar with the success story in agriculture of any African country such as Ethiopia and are there any lessons for Ghana
13. Do you have suggestions for the turnaround of the sector for optimal performance?

Appendix 3: Interview Guide – CEO's/Directors at MoFA

1. Kindly describe your official professional position. Expand on your core assigned duties as CEO or Director at MoFA.
2. Please tell me how long you have been working as a CEO or at MoFA?
3. Please tell me how long have you been working in the agricultural sector in Ghana?
4. Describe your understanding of the structure of the agriculture sector in Ghana.
5. Have you observed any changes in the output mix and quantity of output produced over the last 10 – 20 years and what are those changes?
6. Please describe any observed trend in the agricultural output in Ghana over the last 10 – 20 years highlighting on periods of success versus periods of decline and elaborate on causative factors.
7. What factors do you attribute the current changes [especially decline] in agricultural sector to?
8. Kindly list and describe the agricultural policy initiatives undertaken by the successive governments over the period under study that you are familiar with.
9.
 - a. Of the policies taken by the different governments which ones were effective in raising agricultural output and why and how were they effective.
 - b. Of the policies taken by the different governments which ones were ineffective in raising agricultural output and why and how were they ineffective.

10. Does effective policy direction have a role to play in what is happening in the sector now? If yes, could you please explain what exactly it is?
11. Were there any interventions that were introduced in the past that made progress but have been halted lately? If yes, please elaborate on them.
12. Which sub-sector of the agricultural sector needs urgent attention in your view?
13. Are you familiar with the success story in agriculture of any African country such as Ethiopia and are there any lessons for Ghana
14. Do you have suggestions for the turnaround of the sector for optimal performance?

Appendix 4: Interview Guide – Commercial Farmers

1. Kindly describe your official professional position. Expand on your core assigned duties as a farmer.
2. Please tell me how long you have been working as a farmer?
3. Please tell me how long have you been working in the agricultural sector in Ghana?
4. Describe your understanding of the structure of the agriculture sector in Ghana.
5. Have you observed any changes in the output mix and quantity of output produced over the last 10 – 20 years and what are those changes?
6. What challenges do you face as a farmer?
7. Please describe any observed trend in the agricultural output in Ghana over the last 10 – 20 years highlighting on periods of success versus periods of decline and elaborate on causative factors.
8. What factors do you attribute the current changes [especially decline] in agricultural sector to?
9. Kindly list and describe the agricultural policy initiatives undertaken by the successive governments over the period under study that you are familiar with.
10. a. Of the policies taken by the different governments which ones were effective in raising agricultural output and why and how were they effective.
b. Of the policies taken by the different governments which ones were ineffective in raising agricultural output and why and how were they ineffective.

11. Does effective policy direction have a role to play in what is happening in the sector now? If yes, could you please explain what exactly it is?
12. Were there any interventions that were introduced in the past that made progress but have been halted lately? If yes, please elaborate on them.
13. Which sub-sector of the agricultural sector needs urgent attention in your view?
14. Are you familiar with the success story in agriculture of any African country such as Ethiopia and are there any lessons for Ghana?
15. Do you have suggestions for the turnaround of the sector for optimal performance?