



ASHESI UNIVERSITY

**THE IMPACT OF ACCESS TO CREDIT BY SMALLHOLDER CASSAVA
FARMERS ON CASSAVA PRODUCTION IN GHANA.**

By

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Undergraduate Thesis submitted to the Department of Business Administration, Ashesi University College, a partial fulfilment of the requirements for the award of Bachelor of Science degree in Business Administration

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BUSINESS ADMINISTRATION DEPARTMENT

MAY 2020

DECLARATION

I hereby declare that this thesis is my original work. It has not been reproduced by any author in this institution or elsewhere.

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ACKNOWLEDGEMENT

I would like to thank the Lord for consistently empowering me with His mighty hand throughout this project.

My sincere gratitude goes to Dr Stephen Armah, my supervisor, for his consistent instructions, corrections, patience and guidance from the beginning of the project to the end. I am very grateful.

Lastly, I would like to thank Mr Lawrence Antwi-Boateng, my dad, for his words of encouragement and instructions which has guided me throughout the project.

God richly bless you all.

ABSTRACT

Ghana has over 500 rural banks located at vantage points that could be easily accessible by rural folk engaged in cassava production. About 70 per cent of farmers in Ghana engage in cassava production, and these farmers are mostly in rural areas. These farmers depend on cassava as their source of income, and as food for personal consumption. However, some existing literature reports that rural banks can help alleviate poverty in rural areas by giving out easily accessible credit to rural farmers and households. But is there an impact of access to credit by smallholder farmers on agriculture productivity? Are the farmers gaining access to credit and, is it impacting output?

The objective of the study was to investigate the impact of access to credit by smallholder cassava farmers on agriculture output. The study used mainly qualitative data to gather data from stakeholders such as rural bank officials and Cassava farmers. Interviews, questionnaires and focus groups were used to collect the data. At the end of the research, findings showed that farmers who had access to affordable credit were able to increase their farm size for cassava planting, which increased cassava output. On the other hand, non- credit beneficiaries were not able to increase their increase land size hence had lower output. Lack of collaterals in the form of saving account, high-interest rates, lack of interest in credit accessibility and ignorance were the main credit constraint among smallholder cassava farmers.

key words; Rural Credit, cassava output, poverty Alleviation, Ghana

LIST OF ACRONYMS

ACRONYM	MEANING
SSA	Sub-Saharan Africa
CB	Credit Beneficiary
NCB.	Non-credit Beneficiary
FAO.	Food and Agriculture Organization
IFAD	International Fund for Agriculture Development
MFI.	Institute of Statistical, Social and Economic Research
MOFA	Ministry of Food and Agriculture
NEPAD	New Partnership for Africa's Development
HQCF	High-Quality Cassava Flour

DEFINITIONS AND TERMS

AGRICULTURE CREDIT

"Agriculture credit was defined by Meagan Andrews (2006) as a subset of rural finance dedicated to financing agricultural-related activities such as input supply production, distribution, wholesale processing and marketing".

CREDIT

Some amount of money given to farmers in the form of capital

SMALLHOLDER FARMER

Poor farmers who live in rural areas

AGRIPRENEUR

Another name for farmers

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

The relevance of credit to cassava production in Ghana is what this study tries to investigate. Cassava is a major agricultural produce in Ghana where a majority of the rural population work in the agriculture sector and are engaged in cassava production for consumption and for sale. The problem of cassava production in Ghana is reflective of problems in the Ghanaian agricultural sector.

The relevance of Agriculture cannot be underestimated in the economies of developing countries, and Ghana is no exception. Although Ghana is one of the more prosperous African countries (7th richest African country), it faces similar problems that African countries face. Africa will go far in relation to its economic growth if agriculture is improved (NEPAD, 2003). Agriculture could be enhanced if agriculture was organized as a business (agribusiness) and structured systems and strategies are put in place to facilitate agriculture productions and activities in Ghana and Africa.

Africa is noted to be one of the continents with the fastest-growing populations. Existing literature shows that the people of Africa would double in 2050 (Tempest, 2016). However, with its large number, it is still described as the most impoverished region in the world (Chauvin *et al.*, 2012).

Over the past 30 years, sub-Saharan Africa (SSA) has experienced slow growth in its development though the increase was more deliberate in the

previous decade. While non-SSA developing countries average real per capita income was \$1717 in 2010, that for SSA. was \$688 (in constant 2000 US\$). It is reported that in 2008, 47% of the population of SSA lived on less than \$1.25 a day (United Nations, 2012). This low average GDP per capita has translated to a high level of poverty in SSA.

In 2010, a report by the United Nations Food and Agriculture Organization (UN-FAO) showed that about 239 million people in SSA were hungry and malnourished. Thus, it was concluded that poverty was the leading cause of hunger (Owusu-Antwi et al,2010

However, it is quite disturbing to know that the issue of hunger and poverty has been worsened by economic crises and government reforms (Awotide *et al.*, 2015). This has exacerbated rural-urban African population. Most smallholder farmers have been at a disadvantage due to the persistent increase in the cost of production and consumer prices which are mostly higher than farm produce.

Government decisions involving cuts in expenditure (public, infrastructure) and increased food prices affect low-income groups more than any other group (Bah *et al.*, 2003). Farmers face income risk and loss of assets due to harsh weather conditions and fluctuating of product prices (Olomola *et al.*, 2008).

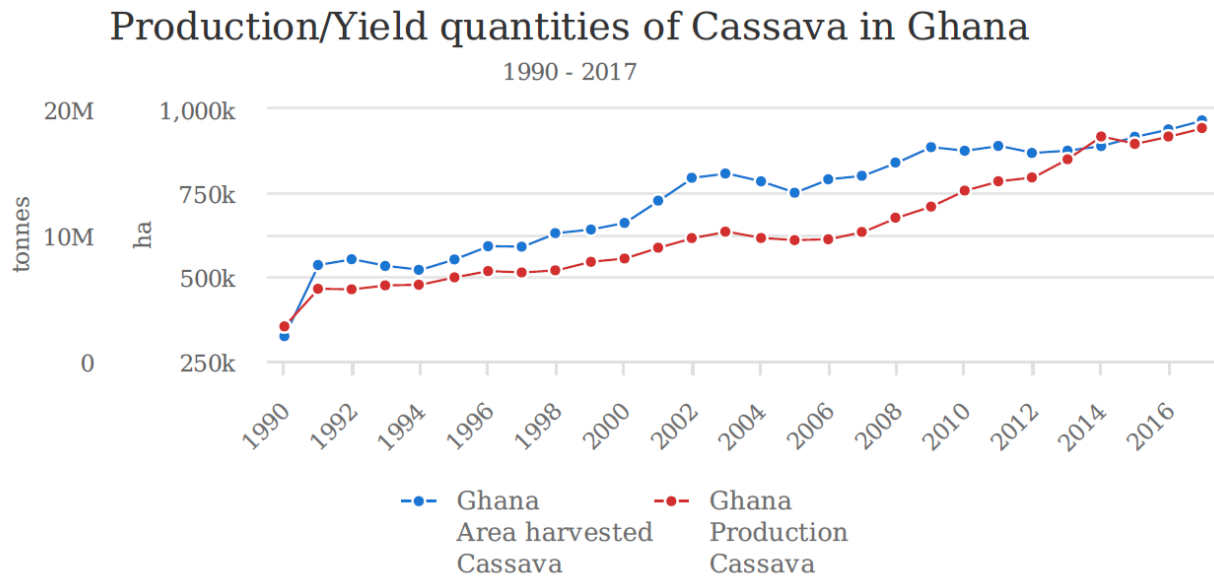
As a result, there has been a reduction in the production of important staple food crops such as cassava in many of the SSA countries, especially Ghana. Though there have been similar studies done in Nigeria, by Awotide et

al. (2015) on the impacts of access to credit by cassava household farmers, there is no corresponding research conducted in Ghana on the same topic.

This study mainly focused on Ghana as cassava production in Ghana is lagging in relation to its growing population though there is an available area for cassava production.

Figure 1.1 gives a graphical representation of cassava production from 1990 to 2017. This is a screenshot from FAOSTAT (2019). From Figure 1.1, it could be seen that the area harvested for cassava is higher than the cassava produced. Though there's available land, the cassava produced is small in quantity relative to area harvested.

Figure 1.1; Cassava production (quantities) from 1990 to 2017

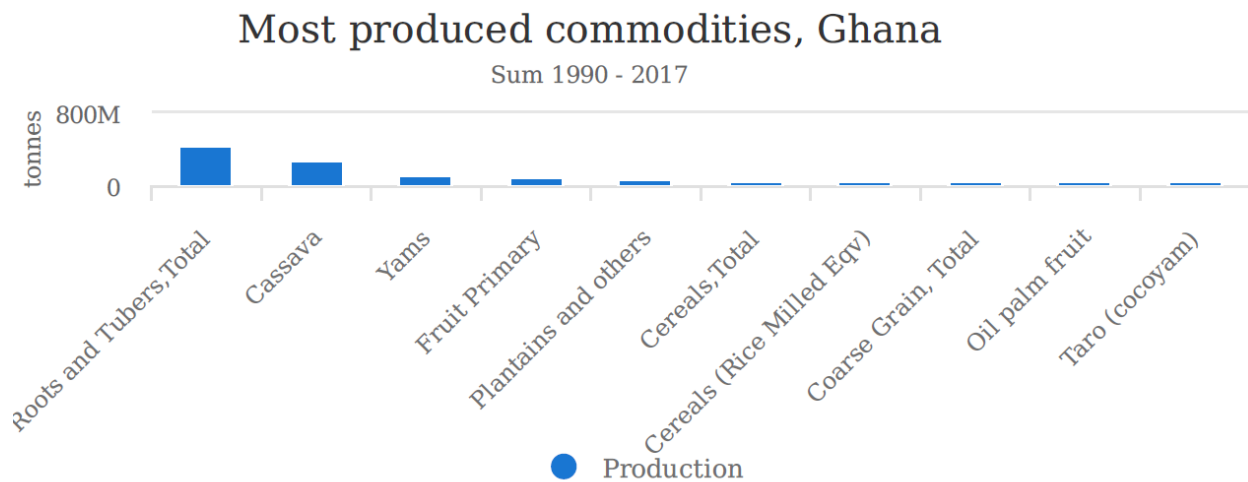


Source :(FAOSTAT, 2019)

Background of Ghana

Ghana is a West African country (2010) with a population of about 24.22 million. The rate at which the people of Ghana increases per year is 2.4% as reported by the worldbank.org. In terms of agriculture, Ghana's main exports are cocoa, horticulture products, seafood, wildlife and timber. Out of the total land size of about 23, 83,900 hectares of Ghana, 13,628,179 is used as agriculture land (MOFA, 2011). Figure 1.2 shows a graph of the most produced commodities in Ghana. This is a screenshot from FAOSTAT (2019)

Figure 1.2- most-produced commodities in Ghana



Source: :(Faostat, 2019)

In Ghana, cassava is one of the major notable food staples among other staple food crops like maize, rice, plantain and tuber. Rural dwellers depend

more on cassava as a source of food for consumption and income. Cassava is very important in the Ghana economy as it contributes about 22% to Agriculture gross domestic product. About 70 per cent of farmers in Ghana engage in cassava production(Dasmani, 2015).

Important of cassava to Ghana

Majority of the population of Ghana either depend on cassava as food and others as a source of income. This shows how vital cassava production is in Ghana. Cassava can be consumed directly by boiling, roasting or frying but can also be pounded to produce "Fufu", milled and used to create "Konkonte" and "Banku" and processed to give "Gari".

Cassava is also a substrate used to produce starch and alcohol, both of which are used in the industry. The benefits derived from cassava are enormous; it enhances welfare and improves the lives of citizens. Increase in cassava production reduces unemployment, so the Government must include cassava production in its policy-making (GOG, ILO and UNDP, 2004).

The total land area cultivation for cassava in Ghana is 87,000ha. The output indicator (2012) for cassava which is measured as metric tonnes per hectare is 19.99(MOFA, 2011). The above paragraphs outline some significant benefits of cassava production.

Firstly, cassava could be described as a domestic and industrial crop. It is one of the food crops, which is on very high international demand (African Center for Economic Transformation (ACET), 2013).

Nigeria and Congo-Kinshasa are known to be the highest producers of cassava, followed by Thailand (Department of Agriculture, Forestry and fisheries, 2010). In 2010, Thailand earned about \$1.5 billion from cassava production as it indulges in internal and external trade. The improvement in the cassava production in Thailand made it possible to ship about 6 million tonnes of dried cassava chips and starch, which contributed significantly to the GDP of Thailand (FAO of the UN, 2013).

Secondly, cassava is the most reliable food crop during locust attack and periods of drought. Cassava is a tropical crop which produces unfailing yield. This is because it withstands drought as compared to food crops like cereals (FAO of the UN, 2013). It is also able to survive acid soil. Cassava is beneficial to human life, animal life, industries, and transport sector as it serves as a source of energy.

In addition, cassava contributes to the elimination of malnutrition in a country. The roots of cassava, known as the cortex, contains a high amount of carbohydrates and some amounts of proteins and other minerals. And the leaves contain a high volume of protein and vitamins, which are all consumed by humans and animals (Food and agriculture organization of the United Nations, 2013).

Not only does cassava helps eliminate malnutrition, but it also serves as a significant raw material in the industrial sector. The various industries receive the fresh cassava and process into multiple forms including high-quality cassava flour (HQCF), Industrial-grade cassava and improved chips or grits.

In the bakery and biscuit industry, the use of wheat or flour in its operations can be replaced by high-quality cassava flour. The Industrial-grade cassava, also known as "traditional kokonte flour" is used in plywood manufacturing. It is also used as a plywood extender. The improved chips or grits provides energy in animal feeds, and wet cassava is being utilized in the Brewery industry (Kleih et al., 2013; FAO of the UN, 2013). Industries, such as the textiles, pharmaceuticals and adhesives make use of the modified starch in their operations.

As cassava is recognized as a major food staple for smallholder farmers in rural areas, strategies were put in place to increase cassava productivity and agriculture productivity in Ghana.

Data showed that the release of an amount of GHS 326.345; which is about USD 56.934 in 2020, to MOFA for agriculture policy and implementation activities boosted the agriculture sector, especially in 2012 (USD 1= GHS 5.73, 2020).

However, in 2013, the percentage contribution of the agriculture sector of Ghana fell from 22.7 % in 2012 to 21.3% in 2013 (ISSER, 2013). Among the three major divisions in Ghana; the service sector, industry and Agriculture, the agriculture sector recorded the lowest percentage of 21.3% with the others recording 50.6% and 28.1% respectively. This fall in the agriculture sector was attributed to the inaccessibility of credit as the money released to support the agriculture dropped by 53.49% in 2013(ISSER, 2013).

Also, some empirical research reveals that the inability of smallholder farmers to access credit have a significant effect on “farm output, farm (Feder *et al.*, 1990; Sial and Carter, 1996), farm investment (Carter and Olinto, 2003) and farm profit (Carter, 1989).”

A scholarly research by Schalkwyk, (2012), showed that lack of funds is one of the significant problems facing almost all smallholder farmers all over the globe. Farmers need finance in order to execute activities such as marketing of surplus farm produce, the production of farm produce and also engage in commercial agriculture and trade. (Jemoh, 2016).

The main focus of the study is to investigate the impact of access to credit by cassava farmers on output in the Akwapim South of Ghana. The research is focused on the Akwapim South District of the Eastern region of Ghana.

The Eastern region of Ghana is the leading cassava production in Ghana. It is then followed by the Ashanti Region and the Brong-Ahafo region. 4, 310, 11 1 MT, 3,481,273 MT and 1,613,607 MT are the volumes of cassava produced in the Eastern, Ashanti and Brong-Ahafo region, respectively (SRID-MoFA, 2006). About 78% of the nation's total cassava production is from the south and middle part of Ghana (FAO, 2000).

This study focused on the eastern part of Ghana, specifically the Akwapim-South district where cassava production is dominant, in order to investigate the impact of access to credit on cassava output.

In rural areas, agriculture is one of the major employers of rural dwellers. The neglect in agriculture could increase poverty, unemployment rate and rural-

urban migration. This would result in the agriculture sector being unattractive to the youth. If the youth are left unemployed, they could indulge in social vices like armed robbery and prostitution, which would be a high cost to the country

Also, neglect in the agriculture sector would mean a fall in economic growth, a deficit in the balance of trade as most staple foods would have to be imported and an increase in malnutrition among women, children and men.

Africa will go far in relation to its economic growth if agriculture is improved and given the needed attention (Nepad, 2003).

1.2 Problem Statement

The welfare of smallholder farmers can be enhanced when there are an improvement and an increase in agriculture production. A renovation and an expansion in agriculture production would enhance farm income, ensure food security, alleviate poverty and improve the household of those in the rural areas. In the macroeconomics of the economy, improvement, and an increase in agriculture production would enhance industrial development hence positive economic growth.

According to Kuznets (1964), the advantages of improvement and an increase in agriculture productivity are numerous. It increases the profitability of industries as agriculture products will be affordable, and it creates rural purchasing power which enables the rural folks to buy industrial goods.

A significant problem that retards growth in the agriculture sector is the non-availability of funds. In every entity, funds play an essential role as it sustains and

maintains the entity. Smallholder farmers need funds in order to have access to resources such as fertilizers, improved seeds and modern technologies in order to enhance their level of productivity (Nweke et al.,2002).

Consequently, access to credit is a vital determinant of the productivity of farmers. Aggregately, smallholder farmer's ability to access credit would eliminate poverty and improve household's welfare. This is because these farmers often invest the funds in high tech inputs, new farm investment and increase land size leading to increase production (Karanja et al.,2014)

The advantages derived from farmers being able to access credit is enormous. However, it is disturbing to know that these farmers are unable to get funds, mainly formal credit (Onumah,2003).

Though there are other sources of credit such as mobile money and informal credit, the money they give out is not enough to help the farmers. The absence of warehouses, small farm sizes accompanied by low production affecting smallholder farmers pose as a high risk to rural credit officials. This is why most smallholder farmers are unable to access formal credit as they lack the requirements needed to access credit. (Onumah,2003).

In 2015, the government of Ghana decided to partner with neighbouring countries like Nigeria in the improvement of cassava production. This is because Nigeria has been able to increase its cassava production, which has improved its livelihood(Dasmani, 2015). Though there have been many other strategies put in place to enhance cassava production such as using cassava to produce high-quality

cassava flour, there are almost no proper strategies regarding smallholders' cassava farmers access to credit in Ghana's case.

Majority of smallholder farmers in the Akwapim South of Ghana have not been able to reach microfinance and rural banks who supply credit. According to Nguyen (2007), there are many factors that limit these financial institutions from reaching the majority of smallholder farmers. This include; low returns received from the credit given out to farmers (i.e. bottleneck), no proper structure put in place to ensure that farmers are being supplied with affordable credits and absence of information between both the financial institutions and the farmers.

However, according to Freeman et al. (1990), it is imperative to analyze and measure the benefits derived from the supply of agriculture credit to farmers in order to increase productivity. In case the marginal return is zero or relatively small with regards to productivity, it would be better off to invest the funds into other sectors with high marginal gains which would equally enhance the welfare of households.

It is why this study seeks to explore the effect of access to credit on agricultural production. Answers to these questions would help improve the credit system in relation to smallholder farmers, eliminate poverty and malnutrition in Ghana. It also explores whether it is worth it to invest resources in strengthening the cassava production through the supply of credit.

1.3 Research Questions

Main Research Question

1. What is the impact of access to credit on cassava output?

Other Related Question

2. How is Cassava farming organized in the Akwapim South?
3. What challenges do cassava farmers face in getting access to credit?
4. What are the channels through which farmers can currently access credit (formal vs Traditional arrangements)?
5. What is the credit requirement for agriculture farmers?
6. What are lessons learnt from the international and African context that are relevant to Akwapim South Farmers?

1.4 Research objectives

Main Research Objective

1. To examine the impact of access to credit on cassava output?

Other Related Research Objectives

2. To determine how Cassava farming is organized in the Akwapim South
3. To identify the challenges, cassava farmers face in getting access to credit
4. To identify the channels through which farmers can currently access credit (formal vs Traditional arrangements)
5. To determine the credit requirement for agriculture farmers

6. To identify lessons from the international and African context that are relevant to Akwapim South Farmers.

1.3 Relevance of The Study

Cassava plays a significant role in the Akwapim South of Ghana. It serves as a source of food to households and livestock. It is also highly demanded internationally in the industrial sector. There is, therefore, the need to improve cassava production by making credit easily accessible to farmers as cassava production is very beneficial to households.

This study is significant as its findings would be beneficial to stakeholders such as the farmers, financial institutions, industries, the Government and households. It would help financial institutions develop the appropriate strategy to give out credit to farmers without making huge losses. It would give insights to farmers on how savings is significant in accessing credits as it could be used as collateral. The study will also inform the public of the impact of access to credit by cassava farmers on cassava production and economic growth. The findings might also attract investors to channel funds into cassava production, especially in the Akwapim South of Ghana. It would also push the Government to implement strategies that would enable smallholder farmers to be supported financially. The study will add knowledge to existing literature and also guide policymakers when taking developmental decisions in the agriculture sector.

Another importance of this study is that it will fill the gap in the literature concerning the issue of access to credit and its impact on agriculture production.

Though there has been many works on credit and its relationship with agriculture, there's no literature that explores the effects of access to credit by cassava farmers in Akwapim South on agriculture production. In this study, emphasis would be placed more on agriculture output. This is because according to Thirtle et al. (1993), production is used to measure the efficiency and performance of the agriculture sector.

1.4. Scope of The Study.

The research focused mainly on stakeholders whose actions directly or indirectly have an impact on agriculture productivity. These stakeholders include Small holder cassava farmers and Rural Bank Officials. Cassava farmers are the receivers of the credit and Rural Bank Officials are the givers of the credit. It also focuses on the Akwapim South District of Ghana.

The Eastern region of Ghana is the leading production of cassava in Ghana. It is then followed by the Ashanti Region and the Brong-Ahafo region. 4,310,111 MT, 3,481,273 MT and 1,613,607 MT are the volumes of cassava produced in the Eastern, Ashanti and Brong-Ahafo region, respectively (SRID-MoFA, 2006). About 78% of the nation's total cassava production is from the south and middle part of Ghana (FAO, 2000).

As the research aims to find the impact of access to credit on cassava production, it would be more appropriate to focus on areas in which cassava farmers are most dominant. This is why the study area is focused on the eastern part of Ghana, specifically the Akwapim south.

1.5 Research Methods

The study is mainly qualitative. Data were collected from rural banks and cassava farmers. Questionnaires, Interviews and focus group were the data collection instruments used in this study. At the end of the data collection, the author was able to gather data on the frequency at which farmer's access credit, challenges faced in accessing credit, inputs employed, the market system and pricing strategies.

1.6 Conceptual Framework.

The Conceptual Framework followed a similar procedure by (Girabi et al., 2013) who also conducted related research. However, the sampling framework was slightly modified by the author of this study to suit its research questions and objectives. This modification was inspired by the research studies of other authors in this field—the framework focused on the access to credit (rural credit) and cassava output.

The framework assumed that some farmers have access to credit while some did not. It also believed that the farmers who have access to credit have some savings records, quite large land size and that serves as collateral. The framework also concluded that farmers who have access to credit are expected to have high output, have new investment, such as education. It also assumed that farmers who have access to credit engage in commercial farming and have available markets.

The increase in output helps reduce unemployment and eliminates poverty. Nevertheless, the framework assumed that farmers who do not have access to credit

do not enjoy all these benefits. According to Olayide and Heady (1982), productivity can only change when the type of inputs and technology employed changes. In this study, the primary input is the change in land size and change in the kind of funds(formal credit) invested in farming activities. It is on this basis that the assumption of this framework was inspired.

Figure-1. Conceptual framework by the author with the help of similar frameworks by Girabi (2013)

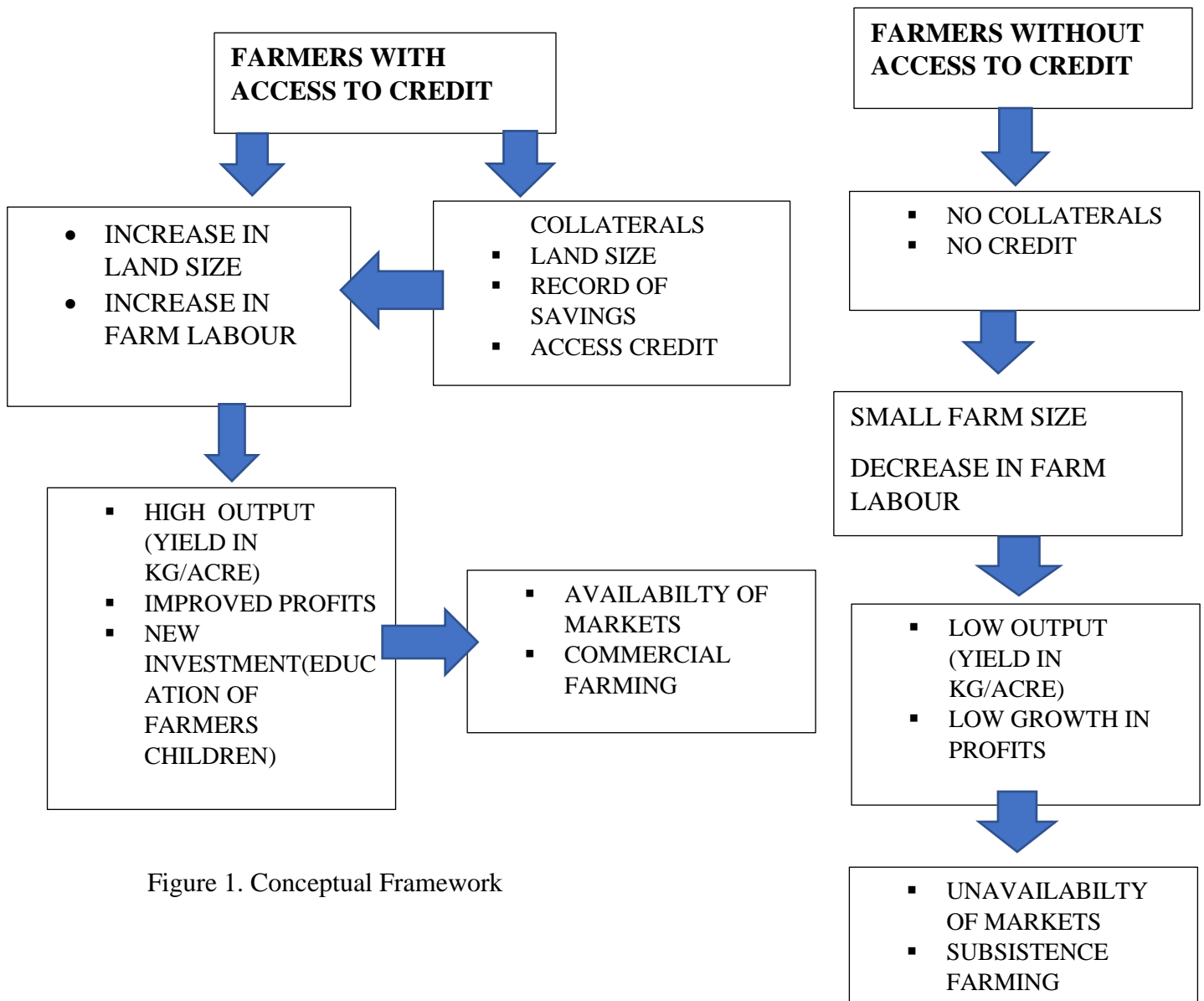


Figure 1. Conceptual Framework

□

1.7 Outline Of Thesis

The following bullets points give an outline of how the research would be organized.

Chapter 1-Introduction

- This Chapter discuss the background and overview of the research topic.

Chapter 2-Literature review

This chapter discusses the existing works on the area of research

Chapter 3- Methodology

This chapter discusses the research technique and design that was used in the collection of the data and gives insights that help answer the research questions of this study.

Chapter 4- Results and discussion

This chapter discusses the research findings and gives indebt details and explanation of the results.

Chapter 5- Conclusions and recommendation

This chapter gives the summary, recommendation and limitation of this research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview of The Literature Review.

This chapter gives a critical analysis of the current discussions on Smallholder farmers' access to credit, especially cassava farmers. It is subdivided into four sections; a discussion of rural credit market system; access to credit and its linkage to agriculture productivity; determinants of cassava productivity in Gha, a discussion on the theoretical and empirical framework used to study the problem of access to credit and its effect on productivity and finally a focus on credit and cassava production. This literature review seeks to justify the gap in the current literature and to make a case for the relevance of the present paper.

2.12A Discussion of Rural Credit Market System

According to Hoff and Stiglitz (1990), formal and informal credit are said to be standard features of the rural credit market system. Formal credit, as defined by Ghate (1992), refers to licensed companies that have been given the authority to provide financial services by a central monetary service. They mostly operate in urban areas. Whiles informal credit as defined by, Kashuliza et al. (1998) is a type of financial services among non-professionals like money lenders, family and friends.

In Africa, smallholder farmers rely more on rural informal credit than the formal credit although formal credit has a more significant positive impact on

household's outcome as it increases rural income and productivity (Binswanger and Khandker, 1995; Khandker and Faruquee, 2003).

Yet, only 5 per cent of African farmers have access to formal credit. (Swain, 2001). Bali Swain (2001) reports that not only does this affect Africa but Asia and Latin America as well. It's been said that only 15percent of rural farmers have access to formal credit, and this is the average percentage for developing countries. Furthermore, literature shows that, out of the many farmers who attempted to access formal credit, only 5 per cent received 80 per cent credit. (Swain, 2001).

This shows that most farmers in Africa are unable to have access to credit to enable them to increase their productivity and is thus a significant problem of smallholder farmers. According to Agnet (2004), smallholder farmers in the rural communities find it difficult to access formal credit from institutions like the commercial banks due to its complex mechanisms and like minimum requirements, collaterals and fixed repayments.

Due to this, farmers turn to use other credit alternatives which includes money lenders, friends, "Susu Operatives" and relatives; this form is known as informal credit, and it's identified to be more costly though funds are supplied for farm operations.

Typically, moneylenders who operate in the informal credit systems have market power. This is because they are few and as a result, charge high-interest rates to maximize profits (Hoff et al., 1996). It is essential that farmers access not just any credit but affordable credit. This is because the credit that is not affordable

pose a high risk to farmers, and this discourages them from accessing credit to expand production.

Nonetheless, these intricate mechanisms in the formal rural credit system run through almost all developing countries. For instance, in Nigeria, according to Onumah (2003), most rural farmers are not attractive targets of rural formal credit as they lack the minimum requirement like collateral to enable rural farmers to access credit. Ghosh et al. (2000) also reported similar conclusions that most smallholder rural farmers could not obtain credit. This is because they do not have the assets that can be used as collateral to access credit. Guarantees are prerequisites for borrowing.

Ghana's informal credit market also has challenges concerning access to credit for farmers. The rural credit system was set up to help supply credit for people in rural areas to help enhance economic productivity (Owusu-Antwi 2010).

There has been schemes and programs established in Ghana to help farmers have easy access to rural credit, but it has been revealed that these policies are in favour of large-scale farmers. Most of the rural credit in Ghana target farmers who are able to use their lands and houses as collateral and these groups are mostly large-scale farmers who form just 20 per cent of the farming population (Owusu-Antwi et al. 2010).

In Ghana, smallholder farmers contribute significantly to the country's agriculture productivity. These smallholder farmers produce farm products like cassava and corn, which are essential to the majority of the people living in the

rural community and the country at large. Being able to access credit easily can help these farmers develop their farms. (Owusu-Antwi et al. 2010).

Farmers who lack collateral pose a risk to the rural banks as there is a high risk of default. This is why most rural banks target farmers who have collaterals in the form of saving account, lands and houses and these groups are mostly large-scale farmers population (Owusu-Antwi et al 2010).

However, collateral is not the only factor that limits rural farmers access to credit, and there exist other factors like high-interest rates, short term loans with fixed repayment that do not favour annual cropping (Philip et al.,2009).

2.13. Access to Credit and its Linkage with Agriculture Productivity.

According to Awotide et al. (2015), access to credit has an indirect relationship with productivity but a direct relationship with the adoption of agricultural technologies and increased capital for farm investment. Access to credit, however, has a direct link with labour hired, improved household welfare through health care and better nutrition. All of these factors positively contribute to agriculture productivity.

Feder et al. (1990) report that farmers who quickly access credit satisfy their cash needs in terms of agriculture activities that comes with the production cycle. Agriculture activities include land preparation, planting, cultivating and harvesting.

Most farmers only have access to revenue during the harvesting period, but the harvesting period is over in a few months. In seasons where the harvesting period is not due, farmers need cash to purchase inputs and materials to enhance

their farms. Farmers need to have access to credit because farmers who are not able to access credit tend to use lower input levels which is inefficient. However, farmers who are able to access credit use high inputs levels which contributes greatly to their agriculture productivity (Feder et al., 1989; Petrick, 2004).

The analysis on the impact of credit and its linkage with agricultural productivity has been explored by many scholarly authors and all results report that there exists a significant and positive link between access to credit and agriculture productivity in most areas but not all areas have been explored.

Similar research was done on the analysis of the impact of credit and its linkage with agricultural productivity in Bangladesh by Pitt and Khandler (1996). They targeted about three credit programs and reported that access to credit by farmers has a positive relationship with household welfare; labour supply, asset holding and education. Freeman et al. (1998) also conducted similar research in East Africa among farmers in dairy production.

Freeman et al. (1998) also reported that the marginal contribution of non-credit constrained farmers was more significant than credit-constrained farmers (Freeman et al., 1998). Low-income rural household farmers who access affordable credit will willingly adopt agriculture technologies. This would increase their income levels because of the use of right inputs which results in greater outputs. (Rosenzweig and Binswanger, 1993; Carter, 1984). Thus, this demonstrates the pertinence of access to credit and its effect on productivity.

2.14. Determinants of Cassava Productivity in Ghana.

Cassava which is one of the major farm products of smallholder farmers in Ghana, has not been produced in both quality and quantity as it is typically provided by smallholder farmers. The use of quality inputs enhance cassava productivity, variety and yield, but smallholder farmers rarely get access to credit to enable them to buy quality inputs. However, it is true that the type of materials implored determines the quality of the roots harvest (Awotide et al., 2015).

The ability for farmers to adopt modern agriculture technologies which include hybrid cassava stake, insecticides, inorganic fertilizer, tractor, appropriate spacing and utilize suitable materials for production all lies in the farmers' access to credit (Nweke et al.,2002).

These technologies increase agriculture production, eliminates poverty and ensure food security in developing countries like Ghana (Iyanda et al.,2014). Feder and Umali (1993) and Cornejo and McBride (2002) also added to the literature that the critical determinant of adoption of most agriculture innovation is access to credit. Farmers' access to credit makes them indulge in risky but efficient investment and become more open to new changes as reported by Eswaran and Kotual (1990), which enhances agriculture productivity.

It is, therefore, true that farmers who have access to affordable credit are able to benefits from smooth consumption and increased production (Swain et al.,2008).

2.15. Theoretical and Empirical Background

Theory-based on the use of credit

Existing literature proves that farmers make decisions based on the existing resources and technologies available to them. Thus, the way most smallholder farmers make decisions concerning the resources to utilize are consistent with the neo-classical profit maximization model (Schultz, 1964). When it comes to the issue of credit, farmers compare the expected utilities of borrowing to non-borrowing. The difference between the possible services is said to be one of the determinants of farmers' decisions in terms of access to credit. (Schulz, 1964).

There have been several empirical models that have been used to assess the determinant of access to credit. Among them are the Tobit, Probit and linear probability models which are the most used models in recent studies. These models treat credit as a binary variable (Owusu-Antwi et al., 2010).

The Tobit model could have been more appropriate for this research as compared to Probit model because it analyses both the probability and the intensity of the credit used by farmers whereas the probit model looks at just the likelihood of the credit assessed by farmers. (Anley *et al.*, 2007). The Tobit model measures the total credit evaluated by the farmer in the production season, taking into consideration the socio-economic and demographic variables.

Nonetheless, though the Tobit model and other models have tried to assess the determinants of access to credit, its weakness is in the fact that access to credit varies from one farmer to the other. Most productive farmers and farmers endowed

with assets have more chance of getting access to credit than the others. The use of simultaneous models, as suggested by Hausa (1993), is the best way to address the varying difference that exists among farmers.

Freeman et al. (1998) in his study, which explored the determinants of credit constraints, employed the switching regression model in its research. It used this model to eliminate any bias that may arise during the collection of data as there are other interventions that provide farmers with multiple services in addition to credit.

"The study used the two-staged switching regression model which adopted the probit model to assess the relationship that exists between the farmers' credit constraint condition and the number of socio-economic and credit variables" (Freeman et al., 1998).

The production behaviour of a group of farmers based on a specified category was assessed using the second stage separate regression equation. The empirical results of this study which was conducted in Kenya and Ethiopia, showed that farmers in Kenya had more access to credit than farmers in Ethiopia. This was because the institutional systems set up to give out credit in Kenya was more effective and willingly rendered more credit to smallholding farmers irrespective of their prior borrowing status as compared to the institutional systems in Ethiopia. The results of the second stage regression model were, however, not different from the first stage.

Past empirical studies reveal that the endogenous switching model identifies a particular decision process and also determines the regression model that is

consistent with each decision model (Alene and Manyong,2007). Farmers access to credit is influenced by both observable and unobservable characteristics, and these unobservable characteristics can either underestimate, overestimate or show the existence of impacts where there is none.

The Endogenous switching controls these unobservable characteristics. "Using the Endogenous Switching Regression model gives a thorough evaluation on the direction and degree of non-random selection of farmers who have access to credit and selection biases that are implicit in Ordinary Least Square (OLS) estimates of access to credit effects" (Mare and Winship, 1987). This can also help to evaluate and investigate how cassava household farmers will fare if they are placed in an alternative scenario. (Mare and Winship, 1987).

2.16. Credit And Cassava Production

According to Schulz (1964), there a positive relationship between access to credit and agriculture output. Credit has a significant impact on farm outputs. Smallholder farmers involved in food crops like cassava are no exception as most of these farmers are rural dwellers and need credit to increase production. There has been quite a number of research in this area, and almost all show proof of how access to credit has a significant impact on agriculture output.

Awotide and Abdoulaye (2015) studied the impact of access to credit on cassava production in Nigeria. The study used stratified sampling to sample the population. Rural cassava farmers were the primary sampling units. A well-structured questionnaire was given out, and data was collected on variables

including gender, credit access, household size, age, years of formal education, and farm size. The study used a Tobit model to find the amount of credit obtained by the farmers and the endogenous switching model to examine the impact of access to credit on agriculture output. Findings revealed that more males than females received access to credit. The research showed that there was a significant difference between cassava farmers who were able to access credit and those who couldn't. Farmers who had access to credit had high output as compared to the farmers who did not have access to credit.

Also, Abhiman and Manjusha (2009) did a similar study on the impact of agriculture credit on agriculture production in India. The study also targeted small scale farmers involved in food crops like cassava. The objectives of the study were to identify the challenges smallholder farmers and credit institutions face in accessing credit and investigate the effect of agriculture credit on agriculture output. The study used economics concepts such as demand and supply analysis. It also used panel data to estimate dynamic econometric models. Findings revealed that inadequate credit provision to small and marginal farmers, over-dependence on funds by major credit institutions were the main constraints in accessing credit. In a nutshell, it concluded that access to credit does have a positive impact on farm output.

Another similar research was done by Frank Girabi in 2013 in Tanzania. The study tried to investigate the impact of microfinance on agriculture productivity. It used stratified sampling to sample its population into two groups; Credit beneficiaries and non-credit beneficiaries. Questionnaires, focus groups and

interviews were the data collection instruments used in the data. Descriptive statistics were used to describe the data, and multiple regression was used to identify the impact of access to credit on farm output. Findings showed that credit beneficiaries had higher production as compared to non-credit recipients. Also, the study showed that lack of information, inadequate credit supply, high-interest rate and defaulting was the significant constraints of access to credit among smallholder cassava farmers.

Finally, a study by Kojo Antwi (2013) on the access to credit and its effect on productivity had similar conclusions as to the aforementioned study in Ghana. The study's objective was to identify how access to credit influence productivity, identify the various forms of credit available to farmers and the factors that influence access to credit. The study used a stratified sampling method to sample its population in the Ashanti region of Ghana. A binary logit model was used to measure the factors that influence farmers access to credit and a multiple regression model was used to determine the impact of access to credit on productivity. In conclusion, it also showed that access to credit has a significant impact on agriculture output.

Even though all three authors used a different methodology and data collection procedures, they all arrived at the same conclusions. That is, access to credit has a significant impact on farm outputs. However, according to Carter and Weibe (1990), agriculture credit does not have a direct effect on production but rather an indirect impact. He explains that this is because the credit is used on

expenses such as the adoption of new technologies, employing advanced farm inputs, hiring of labour and market accessibility.

A difference could be found in the type of data used for the research and the method employed. All the study made were able to use econometric models because they had accessed to a database that contains data of past records of these farmers

However, it could be realized that the commonly used model that was employed to determine the impact of access to credit on agriculture output was the multiple regression. Descriptive statistics were used to describe the statistics of the sample under study.

However, the author of this study employed descriptive statistics with the aid of bar charts, pie charts and themes drawn from the questionnaires, focus groups and interviews administered to the sampling frame in its analysis. This study couldn't make use of multiple regression because of the inability to access quality data. The author couldn't get data for some variable, such as the output of farmers for past years. There's no database that records all the outputs of farmers over the past years as compared to other research done in other countries who had a database that keeps all previous recording of output. Thus this study couldn't employ the multiple regression in this study due to lack of data for some variables.

Furthermore, there hasn't been any research done in Ghana on the impact of access to credit by smallholder cassava farmers on agriculture output. This is the gap in the literature that the study tries to fill. The study attempted to identify the

challenges that smallholder cassava farmers face in accessing credit and its impact on agriculture output.

In a nutshell, this section helps the author of this study understand that credit has a significant impact on agriculture output. However, the credit has an indirect effect on output because it is used on expenses such as the adoption of new technologies, employing advanced farm inputs, hiring of labour and market accessibility.

2.17. Conclusion

The findings presented in this chapter reveals that there exists a credit program that serves as a source of capital for farmers. However, just a few farmers have access to credit as the rest are not able to meet the minimum requirement. Most smallholder cassava farmers are unable to purchase higher levels of inputs to grow their farms and produce on a large scale (Feder et al., 1989; Petrick, 2004).

Access to credit has a significant positive effect on agriculture productivity. The inability of farmers to access credit affects their output as harvest periods are seasonal. Farmers need cash when they are out of season to purchase inputs and materials for their farms. Nonetheless, this does not favour Smallholder cassava farmers as they are mostly poor and are not able to access the right materials to improve their farm activities. Literature also reports that smallholder cassava farmers have not been able to produce in terms of quality and quantity. This is

because they are not able to afford and adopt some modern agriculture technologies and suitable materials due to lack of funding. (Awotide et al.,2015).

There have been numerous researches on Farmers access to credit in relation to key variables like its effect on productivity, GDP, banking sector, diary production, cocoa farmers output, but few on the smallholder cassava farmers access to credit in a typical Ghanaian community like the Akwapim South district where cassava dominates. Policies made to improve agriculture neglect Smallholder cassava farmers as they do not meet the minimum requirement though their contribution to economic growth is very significant (Owusu-Antwi 2010). Most studies focus on African countries like Nigeria but less in Ghana.

Lastly, though there have been similar studies done in Nigeria, by Awotide et al. (2015) on the impacts of access of credit by cassava household farmers, there is no literature or research conducted in Ghana on that same focus. Thus, this study will fill the gap that is missing in the literature and will also help formulate strategies that will enable smallholders' farmers in the cassava production in Ghana have access to credit.

CHAPTER THREE: METHODOLOGY

3.1 Overview of the Method Section

This chapter discusses the specific procedures and techniques that were used in data collection and analysis. It is subdivided into the Research Design, Research Scope, Sampling Strategy, Data Collection, Data Analysis, Reliability and Validity, Ethical Consideration and Limitations.

3.2 Research Design

According to Trochim (2009), the research design gives an outline of the structure of the research work. It guides the researcher during the research process. The purpose of the research design is to provide the researcher with a well-laid out plan as to how the research would be conducted. (Sarantakos, 2005, p. 105). The research design justifies the method being employed in the study and how this method could be used to answer the research question and hypothesis of the study. It also takes into consideration the type of relevant data collected, the sources of the data and the lens through which the data would be analyzed. (Jupp, 2011).

The research design of this study was mixed design but mainly qualitative. Qualitative research enables researchers to derive specific cultural details, including the opinions, behaviours and social context of a population. (Northeastern University, 2015).

Data was collected through questionnaires and interviews. Some farmers couldn't read, so interviews were the best option because it was broken down and done in the language in which they understood. Most of the questionnaires were

handed to the rural officials since they could read and understand the content. The research tried to understand household's credit status, market and production patterns. It also tried to find out farmers view on credit and their understanding of the credit system. It follows a conceptual framework modified by the author and some patterns in similar research by authors such as Girabi et al. (2013). Figure A(which could be found in chapter 1, the introduction of this study) displays the conceptual framework

3.3 Research Scope

These stakeholders included Smallholder Cassava farmers and Rural Bank Officials. The research focused mainly on Smallholder Cassava farmers. This is because farmers directly work on the farms to produce outputs. Smallholder Cassava farmers mostly are the ones who do not have easily accessible and affordable credit based on literature.

They are also the farmers who need resources like credit to improve farm productivity. The reason why rural banks were focused in this study was that the rural banks mainly engage with rural folks like farmers.

The research focuses on the Akwapim South District in the Eastern Region of Ghana. The Eastern region of Ghana is the leading cassava production region in Ghana. It is then followed by the Ashanti Region and the Brong-Ahafo region producing 4,310,111 MT, 3,481,273 MT and 1,613,607 MT of cassava, respectively (SRID-MoFA, 2006). About 78% of the nation's total cassava production is from the south and middle part of Ghana (FAO, 2000).

As the research aims to find the impact of access to credit on cassava production, it would be more appropriate to focus on areas in which cassava farmers are most dominant. The study area of the study is focused on the eastern part of Ghana, specifically the Akwapim south.

3.3.1 Study Population

Cassava farmers in the Akwapim South District were used as the sampling frame for this study. The approximate size of the population of cassava farmers in the Akwapim South is about 500.

The farmers were sub-divided into those who have access to credit and those who do not have access to credit. Farmers were further subdivided into males and females to ensure gender equality. In each gender category, a percentage of each group was selected randomly to make up the total sample. The gender division also helped inform which gender had easy access to credit and whether gender was a factor in accessing credit.

This research divisions of the populations followed a similar format of Girabi et al. (2013) in selecting its sample size. Primary data were from the field research, and the secondary data were collected from resources and materials like past thesis, journals, government and research reports. The secondary data gave a deeper understanding of the rural credit and the agriculture sector productivity.

3.3.2 Study Area

Akwapim South District of Ghana was chosen as the study area because the district has most cassava farmers. Farmers in the Akwapim South District

produce more cassava than any other District. The Eastern region is the leading cassava production in Ghana, followed by the Ashanti Region and the Brong-Ahafo region (SRID-MoFA, 2006). As one of the main categories that the research intends to collect data from are the cassava farmers, it would be quite appropriate to focus on the areas in which these farmers are dominant. Thus, it's another reason why the Akwapim South District was the study area of this research.

3.4.1 Sampling technique

In this study, the primary sampling technique used was purposive and convenience sampling. According to Palinkas, et al. (2013), purposive sampling is a non-random sampling technique that allows authors to select specific cases that are in relation to the research of the author, based on their own discretion. This also means that any group that do not meet the criteria of the study was not included. The purposive sampling was used mainly for sampling financial institutions, and the convenient sampling, which is a type of sampling based on availability and convenience was used in sampling the farmers in the Akwapim South District.

The population was divided into two groups. The first group were credit beneficiaries, and the second group were non-credit beneficiaries. The reason behind this division was to have the opinions of both groups. This was also to identify and compare the outputs of Credit beneficiaries to Non-Credit Beneficiaries. Snowball sampling, which involves participants identifying other participants within the same category, was also used to identify some farmers.

3.4.2 Sample sizes

A sample size of about 50 was employed in this study. This sample size took into consideration gender balance and age (Youth, middlemen, elderly). This sample size included Farmers who were either credit beneficiaries or, non-credit beneficiaries and rural banks..Some farmers were interviews while others were given questionnaires to fill based on their preference.

The sample size of 50 included ten rural banks officials, thirty farmers who were Non-credit beneficiaries and ten farmers who were Credit beneficiaries. Limited time did not permit to have an enormous sample size that is why this study focused on using 50 as its sample size. Also, since the research is mainly qualitative, the sample size of 50 could be considered realistic to be used to make an accurate analysis.

3.5 Data Collection

Data was collected through the combinations of questionnaires, focused groups and interviews. All interviews and questionnaire were put together by the author. All questionnaires and interviews were done on the preference of the participants. No participant, target group or institution was coerced to participate against their will. The author sought permission from the Ashesi Institutional Review Board (IRB), received approval to conduct the research.

The limitation of this data collection was time limitation, and the pandemic, i.e. Covid-19, that is ongoing all over the world. This limitation limited the size of the data that were collected.

3.5.1 Data Collection Instrument and Phases

Data was collected through the combinations of questionnaires, focus groups and interviews. The data collection was in 3 phases. The first phase targeted Rural Credit officials. In this phase, an informant discussion was held among the rural credit officials. Open-ended questionnaires were being used to drive the discussion. The aim of the discussion was to collect data about how the rural credit operate, the benefits and challenges they face in giving out loans to farmers.

The second phase targeted the farmers living in the Akwapim South. This phase used focused group of about 10 participants each to collect data on their opinions on access to credit; the amount supplied, the operations of the rural credit, agriculture output, farm inputs, the availability of markets and their level of education.

In the third phase, open-ended questionnaires and interviews were the data collection instruments. The target group for this phase was the credit Beneficiaries category and the non-credit beneficiaries. 'The main reason for this divisions was to be able to obtain the opinions of each farmer, understand each farmer's credit status and also to know their production and market pattern' (Girabi et al., 2013).

At the end of the data collection, the author was able to gather data on the frequency at which farmer's access credit, challenges faced in accessing credit, inputs employed, the market system and pricing strategies.

3.5.2 Data Collection procedure and processing

Data collection lasted for a period of about one month. During the interviews and focus groups, most of the responses were handwritten. After, these data collected in notes were organized in a well-written report that could be understood and analyzed by other authors who would need a similar source of information in their research.

3.5.3 Data Analysis

Data collected were organized in excel. Data involving numbers and some form of statistics were analyzed using bar charts and pie charts. This facilitated easy comparing of variables and identification of themes and patterns that helped answer the research questions. One focus of qualitative research is identifying themes and trends and being able to interpret the data using the patterns identified (Pell Institute, 2016). Labelled diagrams were also used to give a vivid description of a process. A detailed analysis is included in chapter 4(results section) of the study.

3.5.4 Explanatory variables

The section below gives a detailed description of some variables used in this study

Age: According to Zeller (2001), there is a negative relationship between access to credit and age. This is because older people are ignorant about the operations and procedures of accessing credit from institutions. Thus they are not motivated to go and seek credit from formal or micro-credit institutions. Also, the older people are more risk-averse than, the younger group, so it's very unlikely for the old to go in for credit.

Gender: In most African countries, the activities performed by each gender differ. Men are typically involved in income-earning activities, while women are engaged in household chores and farming activities (Ihahi, 2001). As a result, demand for credit differs with men having the higher chance of accessing credit facility than women.

Level of Education: According to Donald (1976), the higher one's level of education, the more likely it is for the individual to have access to credit. This is because the level of education gives the individual some form of understanding of the operations, procedures and requirement of accessing credit for farming activities.

Member of a collective group: This variable tries to find out whether a farmer belongs to a collective group which aids him to access credit. This is important because the collective group organized for farmers, especially in Ghana helps them to access credit and farm inputs.

Marital status: This variable tells whether the farmer is married or single.

Experience: This variable tries to find out the number of years one has been working as a farmer. The willingness of a farmer to access credit can also be based on its level of maturity in farming.

Farm Size: This refers to the total land size on which the farmer grows cassava. It is a continuous variable. The larger the land size, the more labour needed to work on it. Farmers, therefore, need credit to able to pay these labour during high peaks.

3.5.5 Reliability and Validity

Reliability of a study can be defined as a type of study that has its findings and results being consistent over a long period. In other words in a case, similar methods are used in this field of research, it should produce the same findings (Golafshani, 2003). Validity defines how "true the research is and whether it was able to measure what it intended to measure" from the objectives of the research (Golafshani, 2003). According to Sarantakos (2005) and Trochim (2009), qualitative research should be credible, dependable, confirmed and should be able to be transferred. This is the basis upon which the research was conducted.

The study obtained data directly from the targeted group whose concerns influenced the research only. Accuracy and dependability were ensured in the data collection. The data was thoroughly proof-read and cross-checked to remove errors and redundant data. Also, the data was compared to other studies to reveal whether the findings are consistent with the claims of other authors.

3.5.6 Ethical Consideration

Research involving human subjects should be based on ethics and respect for the consents of participants. (Bailey, 1988). This study, therefore, used ethical values throughout its conduct. The approval of the participant was sought out before the questionnaires were being handed to participants. No participants were forced to take part in any focus group or interviews against their will. Confidentiality was ensured to protect the identity of participants. There was no falsification of results. Results were presented as it is. It was not altered to suit the research.

Most importantly, permission was sought from the Human Subjects Review Committee of Ashesi University College before the research was conducted. This is a unit that ensures that research with human subjects is done in an ethical way.

3.5.7 Limitations of the study.

Time constraint was one of the significant limitations of this study. As a result, large sample sizes (above 50) would not be considered in this study. Also, the language barrier was a limitation as most farmers are fluent in their native language (Akwapim twi). This was a barrier because the author of this research does not fully understand the native language. Methods like the endogenous regression could help to analyze the data quantitatively to give a more in-depth finding. But due to its tedious nature compelled with more extended time periods, this study couldn't employ the endogenous switching model.

Also, the author wanted to employ hypothesis testing in this study. The hypothesis testing was to be used to measure and compare the outputs of farmers who are credit beneficiaries and Non-credit beneficiaries. This comparison would have given deeper insights and understanding of the impact of access to credit on cassava farmers. But due to the pandemic that is ongoing (Covid-19) all over the world, data couldn't be collected, and also the author couldn't reach enough respondents to aid in the hypothesis testing. As a result, the study is qualitative research only.

CHAPTER 4-RESULTS AND DISCUSSION

4.1 Overview of the Results and Discussion Chapter

This chapter answers the research question of the study. It includes sub-headings such as the discussions on how cassava farming is organized in the Akwapim South District, sample demographics of respondents based on a questionnaire survey, challenges cassava farmers face in accessing credit, credit requirement for agriculture farmers and the impact of access to credit on cassava output. The chapter ends with a discussion of the results. Also, all conclusions and implications are based on the questionnaire survey and the in-depth interview sessions used to collect the data from respondents.

4.2 How Cassava Farming Is Organized in The Akwapim South Of Ghana.

The value chain used in the cassava production can be broken down into land preparation, acquisition of inputs, planting and crop maintenance, harvesting and post-harvesting activities.

Land preparation and Planting

Farmers acquire land either by buying the land or on rent. Majority of the farmers do not own a large portion of lands, and so they sometimes rent a piece of land to be able to plant over a wide range. The minimum farm size ranges from 1-5 acres, while the maximum farm size is above 10 acres.

Farmers hire labourers to clear the land, and these labourers use cutlass to do the clearing after the weeded materials are burnt. Weedicides are also used by some farmers to prevent the weeds from growing back. Planting beds are sometimes

made to be able to plant the cassava suckers. The farmers do this together with hired labourers or friends and family. Most of the farmers in the cassava production produce on a small scale, just a few are medium farmers. In the next planting season, suckers from the previous harvesting are used for the new season.

However, most farmers unable to increase output as they sometimes need more people to help in planting the cassava. Hiring labourers raise farm input cost said one farmer, as they do not have enough funding to pay them. This affects their yield because the number of cassava harvested is determined by the amount planted in a season.

Cassava maintenance

In this stage, farmers use equipment like the "spray machine" to preserve the cassava after planting and waiting for harvesting. They also use weed control and disease control, amongst other strategies. According to the farmers, it takes approximately seven months for the cassava to mature. The late maturity is twelve months.

Harvesting

As said earlier, it takes 7 to 12 months for cassava to mature. Hired labourers together with farmers, sort out the cassava and make it ready to be transported to the market.

Trading and marketing

Some Farmers are not able to have access to the market. This is due to financial constraints in the form of farm inputs like tractors or transport cost. Hence they sell their farm products directly on the farm. Market women are the major retailers for cassava farmers as they buy the cassava directly from the market. Farmers also sell at the immediate market within their locality. Trotro (transport system used to convey people and goods) and taxi are usually the means of transporting the cassava to the market.

A farmer narrated that;

If I had access to credit, I would be able to transport most of the cassava to the market for a very good price. This can increase my income. It's almost like the market women who come here to buy the cassava get it for free because they bargain for a very low price. Since they are our main market, we accept it.

It was realized that most farmers had multiple businesses. This is because farming is not profitable enough to cater for their needs. The main challenges of the farmers were lack of access to credits.

4.3. Sample Demographics

4.3.1 Distribution of respondents according to socio-economic characteristics

According to Ogbeide & Ele's (2015), the agriculture sector has more men than women, indicating that the men are the family heads and from which all source of income is derived. The descriptive statistics of respondents in this study in the area of gender is, however, consistent with the claims made by Ogbeide & Ele's.

From the data collected, 85% of the respondents are males as against 15 % of females.

Table 1 summarizes some socio-economic features of the farmers that were used in this research. The table shows that 85% of the respondents are males which reveals that cassava production is dominated by a male-headed household as mentioned already. This could be understandable because of the tedious nature of cassava production as some cassava do well on big heaps which is tedious for female farmers to make. Results show that majority of the farmers (62.5%) have farm size less than 5 acres while 13% have farm size between 6 to 10 acres with just 2% having farm size above 10 acres. From these results, it could be realized that acquisition of land is a problem among cassava farmers and this could further explain why about 60 % of the farmer's plant on rented land while 40% use their own land.

Also, about 80% of the farmers are between the ages of 31 and 60. This shows that cassava farming in the Akwapim South District is in the hands of young people. And these young people are very active. If provided with appropriate inputs in the form of credit and technology, the output of cassava can be increased. The largest household size is about 13 while about, 62.5 % of farmers have a household size less than 10. This reveals that cassava farming is dominated by small scale farmers in the Eastern part of Ghana.

About 85% of the farmers have had some form of formal education ranging from primary school to senior high school. This shows that farmers can read, write

and also understand the process of accessing credit. Yet only 25% of the farmers have access to credit with 75% unable to access credit. About 15% are part of a collective group in obtaining credit, but nonetheless, they have not been able to access the credits. One farmer said;

"The people in the bank kept on tossing us, and so I stopped going there and finally left the collective group".

This was the complaint of one of the farmers who used to be part of the collective group. From the 25 % who were able to access credit, 7.5% used it for agriculture-related activities, 5% acquired the credit for non-agriculture activities while 12.5% used it for both agriculture and non-agriculture related activities.

Table 1: Distribution of respondents according to socio-economic characteristics

Variable	Frequency	Percentage
Gender		
Male	34	85
Female	6	15
Age(years)		
31-40	6	15
41-50	20	50
51-60	9	22.5
61+	5	12.5
Educational level		

No formal schooling	6	15
Senior School	24	60
Primary High School	5	12.5
Junior High School	5	12.5
Tertiary		
Work Experience(years)		
< 10	9	22.5
11--20	15	37.5
21-30	16	40
Farm Size (acres)		
<5	25	62.5
6—10	13	32.5
11—15	2	5
16—20		
21+		
Access to credit		
Yes	10	25
No	30	75
Marital status		
Single	15	37.5
Married	23	57.5
Divorced	2	5

Type of farming		
Subsistence	8	20
Commercial	32	80
Views on credit access		
High risk	33	82.5
low risk		0
Moderate risk	7	17.5
Accessed credit Loans Before?		
Yes	35	87.5
No	5	12.5
Part of a collective group?		
Yes	6	15
No	34	85
Channels used to access credit		
Friends and family	25	62.5
rural banks	10	25
commercial banks	0	0
mobile money	5	12.5
Reasons for not accessing loans		

Collaterals	5	12.5
High-interest rate	19	47.5
no interest	16	40
Sources of financing		
Personal savings	8	20
Mobile money	5	12.5
Friends and family	17	42.5
Credit	10	25
Household size		
<10	25	62.5
11---20	15	37.5
21—30		
land use		
Plant on their own land	16	40
rent land	24	60

Source: Author's Fieldwork, 2020 N=40.*Multiple responses were allowed

4.3.2. Distribution of respondents according to Credit Beneficiaries (CB) and Non-Credit Beneficiaries (NCB)

Out of 40 respondents, 25 per cent were credit beneficiaries, and 75 per cent were non-credit beneficiaries. All the credit beneficiaries were males which reveal that the males are more active in accessing credits than the females. Most of the

women did not have collaterals in the form of an active bank account so that they couldn't obtain credit. Also, most households are male-headed so its males ho go to seek for the credit.

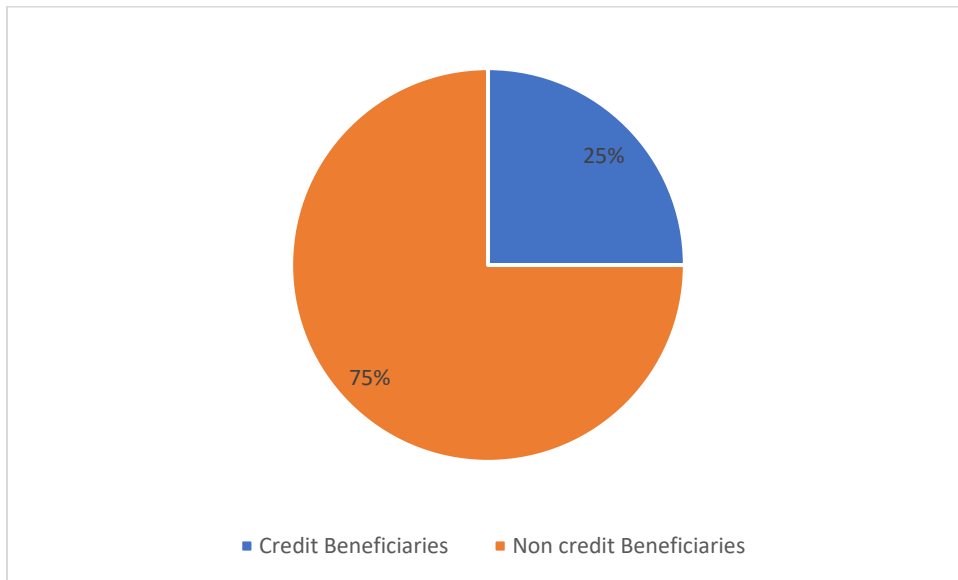


Figure A. Farmer's response on whether they are credit beneficiary or non-credit beneficiary.

(Source: Author's fieldwork, 2020) N= 40

About 98% per cent of the CB are between the ages of 31 and 50. This shows that they are very active as it made up of young people. This group particular could be characterized as the most economically active segment as they have a lot of responsibilities, including paying of school fees, health services, etc. This group of CB have a multiplier effect. This is because their ability to access credit does not only benefit them but also it benefits their dependents. On the other hand, majority of the NCB (35%) were between the ages of 41 and 50.

Comparing the level of education between CB and Non-CB, the results show that about 3.75 per cent of CB out of the 25 per cent attained senior high school while 1.25 per cent attained primary and Junior high school. For NCB, about 33.75 per cent out of the 75 per cent reached to senior high, 5.625 per cent achieved to primary, and 11.25 per cent had no formal education. A comparison between the educational level of CB and NCB shows a slightly significant difference between the educational standards. The only difference was that 11.25 per cent of NCB had no formal education while with all respondent of CD has some form of formal education.

Comparing the family sizes between CB and NCB, the average family size was similar for both. Both groups had an average family size between 6 to 10 persons. In a nutshell, there was no significant difference between the family size and educational level between CB and NCB.

Economic activities of respondents

Findings reveal that 62.5% of the respondents are involved mainly in farming but have other businesses like carpentry, construction work, etc. Just about 37.5% do farming only. According to one farmer, he said

"We don't really make much profit from farming since our funds are not enough to buy the right inputs to increase output. So, I also do construction work on the side to provide for my family".

4.3.3. Profile of Microfinance Institutions

Rural credit Institutions

Table 2 shows a summary of the descriptive statistics of rural credit officials in the Akwapim South District. The results show that almost all the rural credit institutions make provision for credit for farmers. One official said

"the rural folks are the reason why we are still business because of they the ones we mostly work with."

The results also show that about 70 per cent of the rural credit institutions do not sometimes give out loans to farmers due to fear of default. According to rural credit officials, most of the farmers do not meet the requirements needed to access credit. One major requirement of rural credit officials is that farmers should have an active saving account. Farmers who have a dormant account are denied access to credit. This is because the probability of the rural credit institutions not getting their money back is high in this case.

The average minimum amount given out to farmers ranges from about GHS 20,000(USD 3492.86) to GHS 40 000(USD 6985.72) while the maximum amount given out to farmers ranges from about GHS 50,000(USD 8732.15 to GHS 100,000

(USD 17464.30), exchange rate in 2020 is given as USD 1 is equivalent to GHS 5.73,2020. One head of the rural bank institution said

"The amount of money one has in his/her bank account and how active the account determines the amount of credit that the institution would be willing to give to the farmer."

The average interest rate given out on credit is about 30 per cent. The mode of credit payment is mostly done through the farmer's savings account.

Non-rural credit institutions

About five microfinance banks who were non-rural credit were also used in this study. According to the officials in this group, they do not make any special provisions for rural farmers. They operate based on the worth and amount of money in one's bank account. One official said,

"If the farmer already has an active account with them and the face value of his account shows that he can pay back the credit, then he would be the given credit."

Table 2-Distribution on the responses from Bank Officials

Credit officials		
Form of collateral required	Frequency	Percentage
Land	2	20
Warehouse	1	10

savings account	3	30
all three	10	100
Reasons for not giving credit to farmers		
fear of not paying back	7	70
lack of collateral(active bank acc.)	3	30
the minimum amount given by rural banks		
< 2000	5	50
2000-50000	1	10
Maximum		
2000-5000	3	30
<5000	5	50
Mode of loan payment		
credit farmers acc	8	80
In-person	2	20
the average interest rate charged		
30-35%	4	40
20-30%	6	60
Rate of repayment/default		
High	8	80
Moderate	2	20

Low		
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Source: Author's Fieldwork, 2020 N=10 *Blank spaces without answers were allowed

4.3.4. Access to Agriculture Markets by Farmers .

In this study, it was realized that respondents use two main channels to have access to the market. That is through market women who come directly to buy from the farm or the farmer conveying the cassava to the market through tracks. However, it was realized that majority of the farmers sell their farm products directly to these market women on the farm. This channel reduces cost (transport cost).

About 20 per cent of the farmers send their product to the market using trucks when the market women do not give them a good price. This shows that most of the farmers who do not have enough funds to transport the farm products to the market, sell their products at a very low price to these market women (retailers). Hence low income. Nonetheless, out of the 20 per cent of farmers who transport their farm produce to the market, 15 per cent are CB (credit Beneficiaries). From this findings, it could be concluded that making credit easily accessible to smallholder farmers would enhance market access and the bargaining powers of smallholder farmers.

4.3.5. Constraints that limit Smallholder Farmers Access to Credits

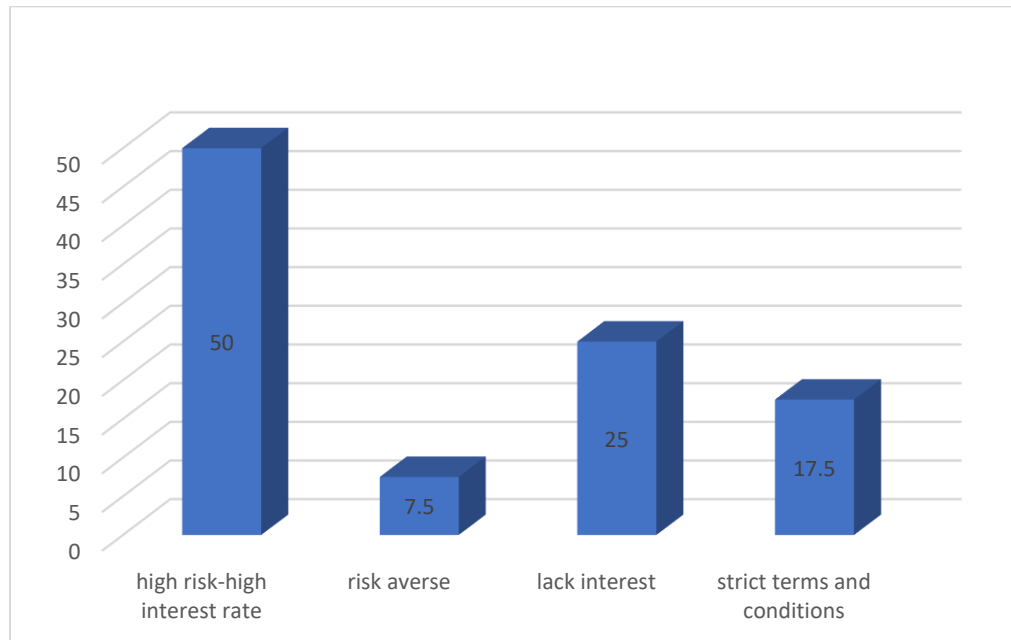
Respondents were asked to rate the main challenges they face in accessing credit in a multiple-choice question. The results showed that 50 per cent view access to credit as highly risky because of the high -interest rate.

7.5 per cent are risk-averse, 25 per cent lacked the interest in accessing credit while 17.5 per cent reported that the terms and conditions applied was too strict. One farmer, who used to be a part of a collective group for taking credit said

"The bank officials told us that if one of us default to pay the credit when it's due, the whole team will pay for that person's debt before we can have access to another credit. So, I left the group because I cannot pay for someone's debt. Also, the people kept tossing us, today they say we should create an account, the next day they say we should bring this document. They never gave us the money, so I got tired and decided to leave the group".

From this, it could be deduced that somehow the rural credit officials fail to give out credits to farmers whether they asked for it and meet all the needed requirement. Could it be that the rural banks are not being fair to the rural folks?

Figure B. Farmer's rating on the challenges faced in accessing credit.



(Source: Author's fieldwork, 2020) N= 40

4.4 Impacts of Access to credit on output and overall farming performance

Farmers can have access to farm inputs and technologies when they are able to have access to credit. Most of the farmers under study reported that if they have access to credit, they will increase the land size to enhance input, hire more labourers to work on the farm, purchase a tractor, and have enough funds to transport the goods to the market. According to Carte (1989), access to credit has a positive relationship with agriculture output.

Unlike the commercial banks that do not make provisions for farmers, especially the rural folks, the rural credit banks do make provisions for the smallholder farmers. The requirement needed to acquire credit at the rural credit is friendlier than that of the commercial banks. The rural credit institutions placed emphasis on the farmers creating an account with the institution and also having an

active account. The institutions further advised these farmers to have a collective group; this reduces transaction cost and collective responsibilities to ensure that each member pays its debts when due.

Market accessibility is made easier for farmers when they have access to credit. Results from respondents showed that farmers who had access to credit were able to transport their farm products to the market and sold their outputs at a good price.

However, non-credit beneficiaries who couldn't transport their farm products to the market sold theirs at a low price to the market women (retailers) who come to buy the farm products directly from the farm. In effect, access to credit has a positive impact on agriculture output (IFAD, 2003). This is because goods sold at reasonable price increases the farmer's income which he further ploughs back into the farming to enhance output. This is consistent with the study by Guirkingner and Boucher (2008) done in Peru, where they reported that output reduced by 26 per cent due to credit constraint but easy access to credit could increase output.

Another finding by Pender et al. (2004) reports that access to credit adds a little impact on agriculture output. This could be concluded that though access to credit is vital to farmers, there could be other factors that affect the output of smallholder farmers. These factors could include efficient markets. Per the results in this study, it was noticed that there were more males than females who had access to credit. This was because the men had ownership over properties such as land,

active bank account or warehouse, which they used as collateral to access credit.

Also, the fact that males are the head of the family, they have the responsibility of taking care of their dependents, but they also have direct control over assets needed for collateral. Gender, age, education and value of assets are the main factors that affect the demand for credit (Ajabe, 2012).

When it comes to the allocation of the credits for smallholder farmers, findings show that about 16% of the credit goes into the agriculture sector. This means that farmers use credit for multiple purposes, including food, health, education, etc. Figure C shows the proportion of credit that goes into agriculture activities and non-agriculture activities.

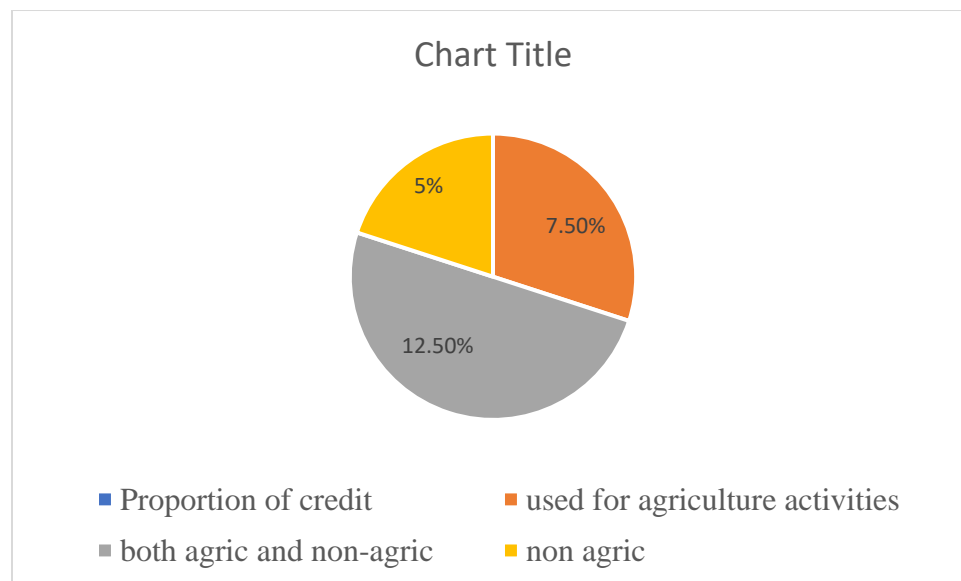


Figure D. Distribution of the Proportion of credit that goes into agriculture activities and non-agriculture activities.

(Source: Author's fieldwork, 2020) N= 10 CB

According to Oboh and Ekpebu (2010), research done in Nigeria revealed that about 43.9% of the credit received by smallholder farmers went into non-farm activities. Farmers who do not use the credit for farming activities are more likely to have no change in their farm output, and this can hinder their ability to pay back the credit.

Farmers should, therefore, be educated on credit before and after they access to credit. Also, farmers who have access to markets are able to purchase farm inputs and sell their farm products at a very high income which boost their income. The ease with which a farmer can have access to market influences his output and farm income (Kamara, 2010).

The findings of this study also showed that farmers who were able to access credit have access to the market had more cassava output, hence increase in income as compared to farmers who were unable to have access to credit. Though rural credit institutions make provisions for credits for farmers, there were some challenges that limit farmers from having access to credit. These challenges include high-interest rates, lack of interest in accessing credit, lack of market information and lack of collateral.

In multiple answers, questionnaires respondent were asked to tick the main challenge they faced in accessing credit, and high-interest rates and lack of interest in obtaining loans were reported to be the main constraint. These results are consistent with the study by Rweymamu et al. (2003) which reported that about

60% and 45% of the respondents in Mbozi and Ukerewe districts respectively, mentioned high-interest rates as the main challenge in accessing credits.

High-interest rate is a disincentive to farmer's access to credit. This is because they would have to use more of their income to pay back the debt, which reduces their income.

Furthermore, according to Gregoire (2006), the cost-efficiency of credit institutions is influenced by a proportion of net assets, financial leverage and portion of farm credits.

From the finding, it could be concluded that rural credit institutions do have a positive effect on farmers output, hence their income. And this positive impact can help alleviate poverty in rural areas. Though it contradicts the study made by Weiss and Montgomery (2005) that shows no evidence of rural credit institutions having a positive impact on poverty alleviation in the rural areas, this study proves otherwise that rural credit does help alleviate poverty in the rural areas.

CHAPTER 5- CONCLUSIONS AND RECOMMENDATIONS

5.1. Overview of the conclusion and recommendation

This chapter gives a summary of the overall study. It is subdivided into a summary of the research, recommendations and further studies that could be explored by other researchers.

5.2. Summary of study

The objectives of this study were to investigate the impact of access to credit on the outputs of smallholder cassava farmers, to determine how cassava farming is organized in the Akwapim south, and identify the factors that constraints the farmers from accessing credit.

The finding shows that farmers who are credit beneficiaries have more outputs and greater access to markets, hence increase in income as compared to non-credit beneficiaries. Most of the farmers under study reported that if they had access to credit, they would increase their land size to enhance output, hire more labourers to work on the farm, purchase a tractor, and have enough funds to transport the goods to the market. But due to lack of funds, they are unable to take on all these activities to increase output.

In the Akwapim South, Cassava Farmer's value chain is broken down into 5 phases, namely land preparation, acquisition of inputs, planting and crop maintenance, harvesting and post-harvesting activities. This is how cassava farming is organized in the Akwapim South. The results also revealed that high-interest rate, lack of interest in accessing credit and strict terms and conditions

applied by rural banks were the major credit constraints among farmers in the Akwapim south. Formation of collective groups to help farmers access to credit as done by the western could be adopted

In a nutshell, access to credit has a significant impact on the output of Farmers. This is because farmers who are credit beneficiaries can purchase extra land and hire labourers to work on the farm. Credit Beneficiaries are also able to transport their farm output to the market to sell at a reasonable price hence increasing their income. Most Credit Beneficiaries can indulge in other investments, like investing in the education of their children. This cycle is more likely to eliminate poverty among smallholder cassava farmers in the Akwapim South.

5.3 Recommendation

In order to ensure consistency in accessing credit, it is recommended that smallholder farmers should build strong collective groups with a strong collective responsibility to make accessing credits from rural banks easier and convenient. It is also recommended that farmers create and have active savings account to enable them to meet the major requirement of most rural banks. Also, the Government should make provisions and create capacity for smallholder farmers to have access to affordable credit. Finally, strict measures should be put in place to ensure that there's a penalty for defaulters.

5.4. Further studies

However, further studies could be done on farmers to understand their investment choices and why a low percentage of the credit received is directed towards farming and a high percentage towards other non-farming activities.

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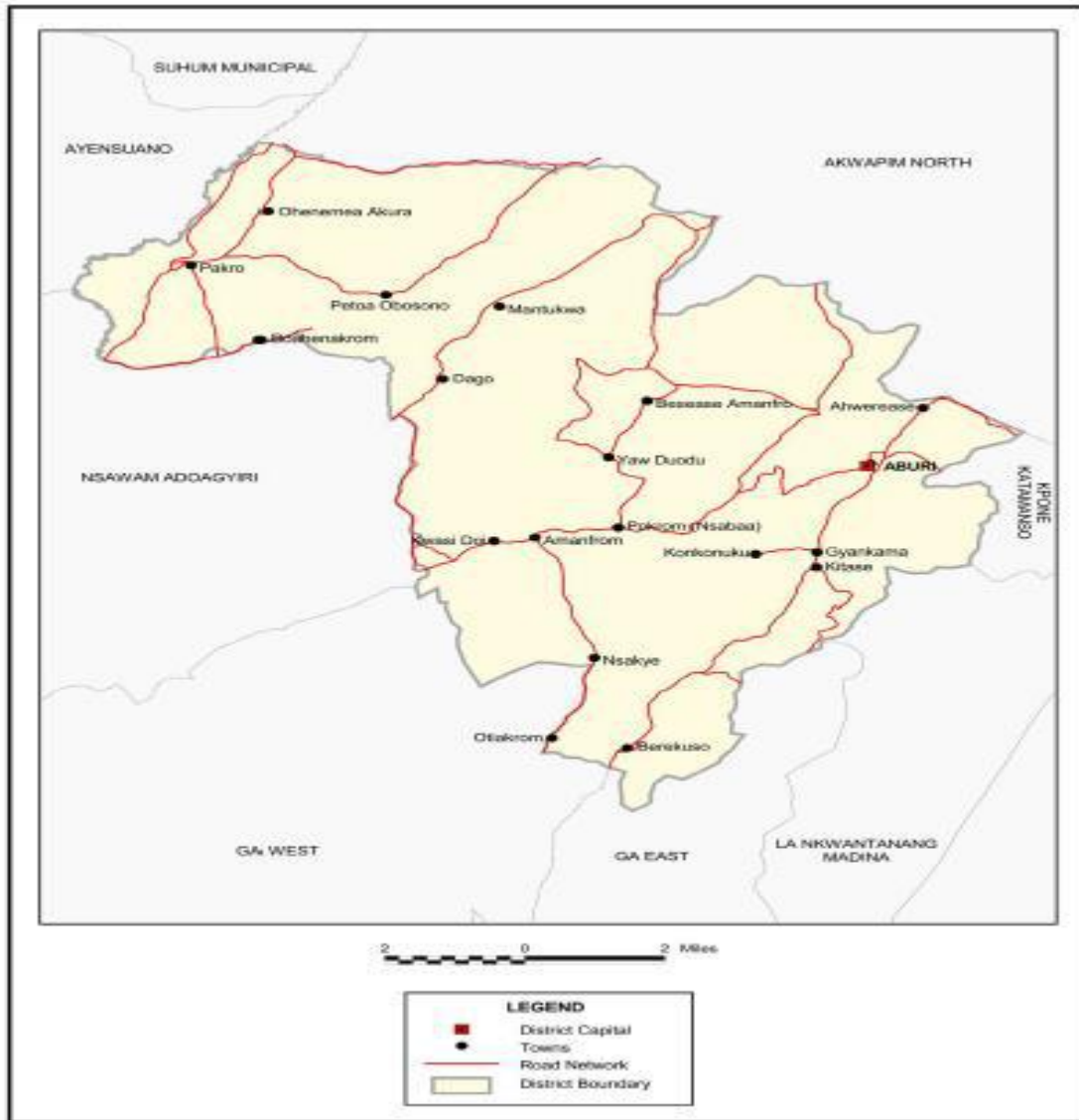
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APPENDICES

A. Map of Akwapim South District



Source: (Ghana Statistical Service, 2014)

B. Interview guide for farmers

Serial number -0011**Section A -All respondents****AREA/VILLAGE:****Date:**

.....

1. Gender

 male female

2. Age

 18 years 19-30 years 31- 40 50 and above

3. Marital status

 single married divorced

4. Level of education

 no school Junior High Senior High University**Section B- Only Farmers**

5. What type of farming do you practice?

 subsistence farming commercial farming

6. How long have you been a farmer?

 below 10 years 11- 20 years 21- 30 years above 31 years

7. Apart from farming, are you involved in any other work/business?

 yes no

8. If yes to question 7, can you please specify the kind of work ?.....

9. Averagely, what is the size of your farm (s)?

Farm A Farm B Farm C.....

10. Do you grow cassava?

Yes No

11. Apart from cassava, what other food crops do you grow?

a..... b..... c.....

12.

Crop	Weight of crop harvested in the previous year (kg)	Area (farm size)/Hectare (s)	Productivity (kg/Ha)

13. How do you transport farm produce to the market?

directly to the market using vehicles picked up by retailers specify

14. What farm inputs do you use?

15. How many people are living in your household?

below 10 people 11- 20 people 21 – 30 people above 30

16. What are your views on accessing loans?

highly risky moderately risky low risk

Forms of Credit available to farmers

17. Have you gone for loans before?

Yes No

18. If yes to question 17, please answer question 18,19, 20 and 21
19. How much were you able to have access to?
- exact amount more than the amount less than the amount zero
20. If you answered no to question 17 please, Tick the one which best explains why you haven't accessed loans before?
- lack of collaterals in the form of land; saving account high-interest rates on loans short term repayment of loans ignorance about loans lack of interest
21. Which sources do you use to finance farming activities?
- personal savings savings and loans funds from relation Credit Union
22. What are some of the channels you've used to access loan? Currently
- commercial banks rural banks money lenders mobile money friends and family
23. What are some of the challenges you have faced when accessing loans? Rate your major challenge on a scale of 1 to 5. With one being the lowest and five, the highest and most critical challenge.
- high interest rates duration of loan repayment lack of collateral (land size) lack of collateral (savings account) lack of collateral (warehouse)
24. What is the credit requirement that must be met before loans are made accessible?
- collateral (land size) collateral (savings account) collateral (warehouse)

25. Did you accessed the loans as an individual or as a collective group?
 Individual Group
26. How long did it take to access the loans?
 immediately within two weeks within a month more than a month

Impact of access to credit on productivity

27. What did you use the loans for? Tick what most applies
 procure farm inputs increase land size to hire labour To buy fertilizer for tractor service to buy improved seeds to buy pesticides to prepare land for cultivation (other -specify)
28. Did the loan access enough for its purpose?
 less more than enough just enough
29. From which institution did you access the loan?
 commercial banks rural banks money lenders mobile money
30. Did you change your farm inputs after getting the loans?
 yes No
31. What new investment did you take on after getting the loan?
 open a saving account invest in Child's education insurance
32. By how much did your productivity increased after you accessed loans?
 below 10 % between 11 – 20 % between 21 -30 %
33. How did the loan influence productivity?
 Positive Negative No influence

Repayment terms

34. What were the terms, conditions and requirement for the repayment of loans?

a..... b..... c.....

35. Were you able to meet the repayment requirements?

yes no

36. If no to question 34, please specify why you couldn't.....

37. In what way do you think the repayment terms can be improved?

C. Interview guide for Rural Credit Officials

Name of Institution.....

Location of Institution.....

1. What are your credit requirements for farmers?

collateral (land size) collateral (savings account) collateral (warehouse)

forming collective groups

2. Reasons why financial institutions avoid giving out loans to small farmers?

fear of not paying back no cash available not profitable lack of collaterals

lack of financial literacy farmers have poor financial management

high cost of extending banking to rural areas most farmers do not have bank accounts

3. Amount of loans given to farmers

Minimum (GHS)

Maximum (GHS)

Frequent amount given..... (GHS)

4. Mode of loan disbursement to farmers.
 crediting the accounts of farmers digital payment to mobile phones
 cash sent to rural areas (mobile banking) collective group
 individual group
5. What is the average interest rate charged by the institution
6. Rate of repayment
 high moderate low
7. Rate of default
 high moderate low
8. Does the institution accept warehouse receipt as collateral
 yes no
9. What are some of the advantages of giving out loans to farmers?
10. Do you have a financial record for farmers?
 yes no
11. If yes to question 10, do you use this records to decide whether to give out loans to farmers?
 yes no
7. If no to question 10 and 11, why not?
9. How often do you give out loan to farmers?
 dry season only whenever farmers need it once a month specify...
10. How is the frequency of farmers repayment?
 meet deadlines exceed deadline before the dead line
12. In what way do you think the repayment terms can be improved?
13. What are some of the challenges in implementing strategies that give farmers easy access to loans?

14. What actions, decisions and strategies do you think would work or would not work in relation to farmers access to credit?
15. 4. Are there any upcoming projects to support farming activities and how will they be implemented