Factors affecting access to finance by Smallholder Farmers in Zambia

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ABSTRACT

About seventy-seven percent of Zambia's citizens who are engaged in primary activity in the agriculture sector are poor (Economies, 2017). One of the ways in which the poverty levels can be reduced is by lessening constraints of access to finance in agriculture sector.
The implications of the low access to credit in the agriculture sector is reduced productivity, high food insecurity and perpetual poverty particularly in Zambia's rural areas.

Most of the studies conducted focused on identifying factors which limit participation in agriculture finance from the bank's perspective and not farmers. Therefore, this study sought to fill the gap and assess variables directly related to smallholder farmers access to finance. It further examines the dynamism of access to finance depending on location, gender and transport infrastructure.

The data employed in the study was obtained from a survey conducted in 2013 by IAPRI and UNZA with a sample size of 1,231 households in six districts of Zambia. Agricultural credit for small holder farmers (SHFs) in rural areas is mostly provided in the form of cash or in kind through supply of inputs to these SHFs. This data was modeled based on the logistic regression. The results showed that 14.1% of the SHFs had access to finance. Among these farmers only 13% were female. In addition, secondary education, access to finance information, farm size, access to collateral and distance between the location of the farmer and the financial services, were significant factors in determining access to credit.

A recommendation proposed to policy makers based on results presented include sensitization on various finance facilities available to rural farmers so that they are aware and can make necessary efforts to access the finance. Rural education is directly related to access to finance, therefore government should promote education for its citizens. Lack of collateral has been identified as a factor that gravely hinders access levels by most. Government should implement standardized policies that ensure availability of credit to farmers with little or no collateral.

In conclusion, improved credit permeation in agriculture sector promotes sustainable and inclusive growth in Zambia and will eventually eradicate absolute poverty.

Keywords: Smallholder farmers, agricultural finance, collateral, literacy levels, household.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AFR	Annual Financial Report
CBI	Cash Based Interventions
CEC	Crop Estimates Committee
CMA	Collateral Management Agreement
CSO	Central Statistical Office
FAO	Food and Agriculture Organisation
FI	Financial Institution
FRA	Food Reserve Agency
FSD	Financial Sector Development
GDP	Gross Domestic Product
GRZ	The Government of the Republic of Zambia
IAPRI	Indaba Agricultural Policy Research Institute
IFC	International Finance Corporation
MFI	Micro Finance Institution
MoA	Ministry of Agriculture
MSME	Micro, Small and Medium Enterprises
NAPSA	National Pension Scheme Authority
NBFI	Non-Bank Financial Institutions
NDP	National Development Plan
NFIS	National Financial Inclusion Strategy
NFSD	National Financial Sector Development Policy
RALS	Rural Agricultural Livelihoods Survey
SAGIS	South African Grain Information Service
SDG	Sustainable Development Goal
SHF	Smallholder Farmer
SMA	Stock Monitoring Agreement
SME	Small and Medium Enterprises
SNDP	Sixth National Development Plan
SSF	Small Scale Farmer
UN	United Nations
UNDP	United Nations Development Organization
UNZA	University of Zambia
ZAMACE	Zambian Commodity Exchange
ZDA	Zambia Development Agency
ZNFU	Zambia National Farmers Union

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Poverty can be described as the limitation of access to income and resources for livelihood sustainability and it negatively impacts the efficient mobilization of various important social needs such as education and healthcare.[1] Having identified the grave perpetual effects of poverty, one of the Sustainable Development Goals (SDGs) of the United Nations (UN) is to eradicate extreme poverty and of great concern to the UN is Sub-Saharan Africa, with approximately 42 percent of the population living below the poverty line.

Agriculture is cardinal in the fight against extreme poverty. About seventy-five percent of poverty afflicted population globally lives in rural areas, with most of the people sustaining their families through agricultural activities.[2] Agriculture is the mainstay of many developing countries, particularly for most low-income rural and semi-rural communities globally. More than two and a half billion people survive from agricultural activities[3] and the communities in this sector of smallholder farmers (SHFs) are key to ensuring food security and contributing to poverty alleviation in the areas where they dwell. SHFs manage an estimated five hundred million smallholdings in agriculture ; in most developing countries, particularly in Southern Asia and Sub-Saharan Africa (SSA), SHFs provide a significant portion (over 80%) of the food consumed.[4] About fifty percent of the food requirement globally is produced by SHF, however what is surprising is that agricultural productivity in most emerging markets still remains very low.[5]

Improvement of agricultural productivity is possible. Deliberate action needs to be taken to increase access to agriculture inputs such fertilizers, good quality seed and pesticides; in addition, having a readily available off-taker market for the produce (suppliers of inputs, aggregators, soft commodity traders, warehouse receipt systems and commodity exchanges for

[1] https://www.un.org/sustainabledevelopment/poverty/
[2] http://www.fao.org/sustainable-development-goals/goals/goal-1/en/
[3] http://www.ifad.org
[4] International Fund for Agricultural Development (IFAD). 2013. Smallholders, food security and the environment. Available at: www.ifad.org/climate/resources/smallholders_report.pdf.
[5] Scaling up access to finance for agricultural SMEs: Policy review and recommendations. Available at: http://www.ifc.org/wps/wcm/connect/04da89804a02e2e19ce0fdd1a5d13d27/G20_Agrifinance_Report.pdf?MOD=AJPERES

agriculture products particularly grains) furthermore, making credit facilities more accessible to a wider farming community (Soko Directory, 2016)

Despite Zambia's population being sustained through agricultural activities about seventy-seven percent of the population whose primary activity is in agriculture are considered poor (Economies, 2017). There are a number of challenges faced by agricultural producers particularly in low income emerging markets, some of which are; low agricultural output, difficulty accessing off-taker markets for their products, lack of appropriate risk mitigating products or services and little access to funds or credit facilities (IFC, 2014).

Majority porof the population in most developing countries is employed in the agriculture sector and this is has been identified as a key driver for economic activity in Africa employing about 55% of the population. Despite the evident importance of the sector, only an estimated one percent of bank lending is channeled to the agricultural sector. Furthermore, in rural areas only 4.7% of adults have accessed credit from a formal financial institution and only 5.9% own a bank account (IFC, 2014). Implementation of solutions to stimulate access to finance by SHFs has been identified as cardinal to the Government of the Republic of Zambia (GRZ) and policy makers have made efforts to embark on various programs and measures to support SHFs in Zambia as means to develop the agriculture sector, alleviate poverty in rural areas and subsequently diversify the economy.

In Zambia, the agriculture sector is the fourth largest contributor to GDP and accounting for 8.7 percent in 2017. Previously in 2011, the sector contributed around 16% to GDP and continues to be the largest employer of the Zambian labour force. Through various initiatives the Government targets to create over 500,000 new jobs in the agriculture sector over a five-year period (Sebatta *et al*, 2016). In addition, Sebatta *et al* (2016) notes that the agricultural sector in Zambia supports about 80% of the population and part of the population that is exclusively dependent on agricultural related livelihoods are significantly poor and live in the rural country side. The author further purports that in order to improve the status of poverty and the quality of rural lives, access to rural finance should be of high priority. Increased access to rural finance should focus on ensuring wider access to banking services and credit in rural areas (Sebatta *et al*, 2016).

It has also been observed that in most African countries that not only does agriculture increase income food security, it is able to stimulate growth in other sectors of the economy and

ultimately reduce poverty and enhance sustainable rural development. However, agricultural productivity in Africa has been on a declining trend as a result of a host of factors such as war, lack of knowledge on agricultural resource management, drought, limited land or farming space, financing, climate change, floods and global warming (World Bank, 2013).

Agriculture is the backbone of most rural income generation in Zambia and will remain the mainstay of the economy for decades to come. Despite favorable weather conditions, fertile land and a wealth of water resources, only fifteen percent of the forty-seven percent of the total land is under cultivation meaning that there is potential for the country to increase its agricultural productivity. The Government of Zambia (GRZ) recognizes that a key constraint to developing the sector is the cost of finance and aims to give direction to the financial sector by putting in place measures to improve credit provision to MSMEs.

Similarly, the International Finance Corporation (2015) notes that access to financial services, while not a means to an end, is critical for the provision of funds for investments in farm productivity, improve post-harvest practices, smooth household cash flow, enable better access to markets and promote better management of risks. Access to finance can also play an important role in climate adaptation and increase the resilience of agriculture to climate change, thus contributing to longer term food security. The access to a comprehensive range of financial services is a significant challenge for smallholders, who constitute the vast majority of farmers in developing countries. The crux of this paper is to unbundle the factors that prevent this much needed finance permeated to small holder farmers.

1.2) Overview of Agriculture Finance

Meyer (2011) defines agriculture finance as the extension of various types of financial support for agriculture activities and businesses for inputs, cultivation, distribution, post-harvest requirements, processing and marketing. Meyer further describes agricultural financing as provision of financial services for farm and farming related activities in addition to support of the whole value chain from supply of inputs such as fertilizers right through processing, off-takers and marketing of the produce (Meyer, 2011).

According to a report published in 2010 by the Zambia National Farmers Union (ZNFU), Zambia's market for agricultural financing does not operate efficiently. According to most

farmers, they have difficulty with accessing agricultural financing coupled with the fact that it is not affordable and the lenders are biased towards the larger corporate clients . The turnaround time for processing of loan applications is too long and the tenor of most credit facilities is often too short to be practical to service appropriately. Thus making this sector even more risky if the loan repayment dates are not correctly matched to the borrowers expected income from their sales proceeds. This income and expense mismatching augments the risk level of the sector further.. The ZNFU further notes that from the bankers' perspective, agricultural lending is both risky and expensive and consequently banks are reluctant to lend without requesting a very high collateral coverage and a high-risk premium. In instances where banks have lent to clients in the agriculture sector they have had to record hefty losses. The large number of non-performing loans extended to agriculture is significantly high and exceeds thirty seven percent when compared to thirteen percent across all other sectors of the economy. This in turn has deterred banks from lending to the sector. (ZNFU, 2010).

However, agriculture financing in Zambia remains a window of opportunity for the growth of investment portfolios of many private sector enterprises interested in providing funding to agriculture, as well as for smallholder farmers, off-takers and processors of agricultural products but accessing this finance faces a number of challenges (CABRI, 2014). Some of these challenges include, among other, seasonality of production and the sporadic sales proceeds, high cost of doing business, and systemic risks, such as floods, El Nino weather patterns, crop diseases coupled with lack of sufficient agricultural risk mitigants. All of which make access and availability of financing more difficult (IFC, 2014).

Therefore, this paper seeks to investigate the factors which influence access to finance by smallholder famers in Zambia as the Small Scale Farmers (SSF) are the main contributors to the country's food security.

1.2 The Problem Statement

Africa faces challenges with access to markets and financing in the agricultural sectors for basic infrastructural development[6]. Access to finance allows small businesses to undertake productive investments and contribute to the development of the national economy and reduction of poverty in most of Sub- Saharan African countries (Beck and Demirguc-Kunt,

[6] https://www.howwemadeitinafrica.com/agriculture-africa-potential-versus-reality/57635/

2006). Though Zambia's agriculture is dominated by smallholder farmers, it still remains underdeveloped (Chirwa and Odhiambo 2016). A survey conducted by the World Bank on Enterprise Development in Zambia (2007) identified poor access to finance as a major impediment to investment and growth in Zambia. CABRI (2014) conducted a case study on Zambia with regards to credit access and found that only 13% of small-scale farmers had access to credit. Additionally, Sebatta *et al* (2014) reported that the economic reforms in Zambia caused the melt down of extension of loans to SHFs after the liquidation of banks which led to only 11% of SHFs being able to access credit in the 1990s.

The implication of the low access to credit is reduced productivity, high food insecurity and perpetual poverty among small scale farmers.

The studies cited above mainly concentrated on identifying the factors that limited participation from the banks' perspective and not farmers. Other studies conducted focused more on a qualitative and descriptive approach which may not have resulted in robust results. It is thus critical that a study is done to identify the factors that affected smallholder farmers' access to finance from their perspectives and adopt a robust approach by using a quantitative approach.

1.3 Research Objectives

1. To determine the proportion of smallholder farmers accessing finance in Zambia.
2. To identify the factors that affect access to financing by smallholder farmers in Zambia.

1.4 Research Questions

1. What is the proportion of smallholder farmers that have access to finance in Zambia?
2. What factors determine smallholder farmers' access to finance in Zambia?

1.5 Justification for the study

Small scale farmers play a crucial role in the fight against poverty. Knowledge on factors that affect small scale farmers access to finance will lead to improved implementation of programmes that are aimed at enhancing farmers access to finance. In addition, knowledge of factors affecting farmers access to finance will help policy makers to come up with agriculture finance strategies that will result in farmers accessing affordable finance which will enable them have the financial muscle to access inputs on time which is critical for increased production.

This will not only result in improved productivity among SHFs but also result in increased food and income security among farm households, communities and Zambia as a whole.

Additionally, increased productivity will significantly contribute to the growth of the country's GDP and effectively reduce poverty in the country as per the SDG1 goal. Furthermore, the study will also add to the existing body of knowledge on agricultural finance in Zambia and Africa in general.

1.6 Organization of the study

The paper is organized in five main sections. Chapter one is the pre-amble to the research topic. Chapter two details the literature review which includes both the theoretical and empirical review of the literatures on the research topic, the chapter further unbundles the overview of the agriculture sector in Zambia and elucidates on government support structures and policies. To further understand the topic under study, related studies on factors influencing access to financing for agriculture growth in other countries and their findings are discussed. Chapter three describes the methodology adopted for the research which includes the study area, the analytical framework and regression model adopted and provides data analysis to ensure research reliability and validity. Chapter four articulates the results of the statistical analysis and unearths the factors affecting agriculture funding in Zambia. This chapter also covers the demographic characteristics and factors affecting smallholder farmers' access to finance in Zambia. Finally, chapter five summarizes the study, provides conclusions and recommendations for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The main thrust of this paper is to assess factors affecting agriculture finance and help inform policies to ensure these factors are addressed and managed. This chapter builds on theoretical and conceptual literature. The key concepts include the factors affecting access to finance which are cost of credit, collateral and accessibility of financial institutions, the structure of the financial sector in Zambia. Furthermore, the chapter includes definition of key terms and the theoretical foundation as the basis of the study. The chapter also articulates the impact the factors have on number of facilities accessed by smallholder farmers in Zambia. The chapter concludes with the conceptual framework for the study.

2.3 Definition of Key Terms

2.3.1) Smallholder Farmer

This study is based on the factors which impact the agricultural population with respect to access to finance in particular smallholder farmers. The agriculture population refers to the section of a population whose livelihood is dependent on agriculture, livestock raring, fishing, hunting, fishing and forestry. This includes all households whose primary economic activities are in agriculture inclusive of their non-working dependents (Morton, 2007). Though there is no widely recognized definition of a smallholder farmer (Morton, 2007), most farmers who fall under the category of smallholder farmer usually cultivate less than ten hectares (Ha) of land for which the main use is domestic food security and as a source of income (Cornish, 1998; Nagayets, 2005). It is estimated that smallholder farmers occupy eight-five percent of the world's farms (Nagayets,2005) and produce eighty percent of the world's food consumption in emerging markets (IFAD,2013). In Africa they occupy an estimated sixty-two percent (FAO, 2014). Whilst in Zambia roughly 80 percent of the country's food requirements is produced by

smallholder farmers[7]. The Ministry of Agriculture categorizes the agriculture sector into four main divisions as follows:

Table 1: Farmer Categories by Land Size

Category	**Hectares**	**# of Farmers**	**Crops**	**Type of Production**
Small-scale	less than 5 ha	792,212	Food	Subsistence
Emergent/Medium Scale	5 to 20 ha	20,728	Food/Cash	Subsistence and Sales
Commercial/Large Scale	20+ ha	2,052	Cash	Commercial

Source: CSO (2001)

2.3.2) Agriculture Finance

According to Meyer (2011), agriculture finance is the extension of various types of financial support for agriculture activities and businesses for inputs, cultivation, distribution, post-harvest requirements, processing and marketing. Meyer (2011) further describes agricultural financing as provision of financial services for farm and farming related activities in addition to support of the whole value chain from supply of inputs such as fertilizers right through processing, off-takers and marketing of the produce. Agriculture finance also referred to as agriculture credit may be sourced from institutional and non-institutional channels which include cooperative organizations, commercial institutions such as banks and MFIs, and development organizations. According to Olomola (1999) funds sought from non-institutional sources for agricultural credit cannot be used for developmental purposes. In reference to the IFC, agriculture finance and agricultural insurance are key instruments for alleviating dire poverty. Globally there are approximately five hundred million smallholder farming households representative of 2.5 billion people of whomto a great extent rely on agricultural production for their livelihoods. IFC provides agriculture finance and insurance which facilitate the growth of up scaling of smallholder farmers through commercialization and access to upgraded technologies, deployment of appropriate climate friendly practices, risk management and access to financial management tools and smoothing the transition of non-commercial farmers out of agriculture and facilitating the consolidation of farms, assets and production (IFC).

[7]Integrated Production and Pest Management Programme in Africa
www.fao.org/agriculture/ippm/projects/zambia/en/

2.3.3) Financial Sector

A financial sector facilitates the use of money for payments through various channels, investments and savings. It also includes financial infrastructure that is reinforced by legal and regulatory frameworks supporting the operations of payments systems , financial transactions, audit , accounting practices and financial disclosure.[8] The World Bank further describes the financial sector as "the set of institutions, instruments, markets, as well as the legal and regulatory framework that permit transactions to be made by extending credit."[9] In Zambia, the role of the financial sector is equally concerned with the monetary policy and banking matters and provision of financial services to commercial and retail banking clients. This sector is regulated by the Central Bank (The Bank of Zambia), the Pension and Insurance Authority (PIA - for all local pension funds and insurance companies excluding NAPSA) and the Securities Exchange Commission which regulates the capital markets. (NFSD Policy, 2017).

2.3.4) Collateral

An asset pledged as security for a loan serves as a way to mitigate default risk in the event that a borrower fails to meet their obligations to make repayments of interest and principal. This form of security can take various forms; the suitability of collateral which should be pledged by a borrower is determined by a lender. The most common form of security is that of brick and mortar (residential or commercial property). Other types of collateral which are commonly acceptable are credit insurance and securities such as equity, treasury bills and bonds. In some countries with well-established commodity exchanges, both hard commodities such as minerals, metals and soft commodities can be pledged as collateral for a loan. Additionally, some banks offer structured products which facilitate the pledging of soft commodities such as maize, wheat and soya by depositing it into a bank approved warehouse which is secure and monitored by a bank appointed collateral manager who issues a warehouse receipt as proof of title of the collaterised commodities against which a bank can extend credit. This sought of lending is commonly knowns as Financing Against Warehouse Receipts (FAWR). However, what should be noted is that collateral is a secondary repayment source for a loan whilst the primary source of repayment is the revenue generated from the operations of a company; an understanding of the client's working capital cycle is therefore key for purposes of not exceeding the amount of capital which a company can borrow and to ensure that the revenue

[8] https://www.sida.se/contentassets/d00d7e9fbc0c4fd7a03b9d9a759b4900/sidas-policy-on-financial-sector-development_1161.pdf
[9] http://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/financial-development

collections are matched with the repayment timings. According to a study by Ali Chandio et al (2017), the lack of sufficient collateral is a key factor which often impacts the accessing of formal credit by farmers. Collateral is a great hindrance for rural farmers ability to access finance as most have little or nothing of value to pledge. The most easily accessible collateral in most developing countries is land for which owners can provide proof of ownership such as a title deed to access formal credit. In agriculture financing, the other common types of acceptable collateral by formal lenders are income and livestock.

2.3.5) Literacy level and Education

Whilst pledging of sufficient collateral is a key ingredient for granting of credit facilities, a borrower's education level and business acumen matters. Information asymmetry in most developing countries has hindered credit facilities and has led to most lending institutions being risk adverse. Literacy is a key necessity for human development with the United Nations promoting quality education as one of the SDGs: ensure inclusive and equitable quality education and promotion of learning opportunities for all. Education has vital benefits for the livelihood of people and influences the ability to have access to information and other resources required to have a positive impact in their lives. The literacy and numeracy abilities are a means to a better future and are essential for improvement of various aspects of a community. With respect to smallholders, literacy is required to enable them to practice financial literacy, record keeping, effective communication, business management and marketing (IFC, 2013).

2.3.6) Household

The Central Statistical Office (2010b) define a household as a group of people who normally live and eat together. The people who comprise of a household may not be related by blood, marriage or adoption, but join efforts to provide food and other essentials for living and they have only one person whom they all regard as the head. They further go on to state that a household can also have one member. (Central Statistical Office., 2010b).

2.3.7) Household Head

A household head is defined as a person regarded as such by all household members and responsible for making day-to-day decisions regarding the welfare of the household. These decisions may range from farming to issues related to finance borrowing (Central Statistical Office, 2010b).

2.3.8) Female Headed Household

According to the Central Statistical Office (2010b), a female headed household is a household which is headed by a female (Central Statistical Office, 2010b)

2.4 Theoretical Review

Several theories have been purported on aspects that guide interaction between a lender and borrower. These stylized theories have formed a basis for the identification of eligible borrowers, alignment to lenders' requirements as well as what dynamics determine the choices made by borrowers such as smallholder farmers with respect to best use of financial resources available.

The first theory that guides financial lending and borrowing is called the Credit Rationing Theory. According to Stiglitz and Weiss (1981), the theory describes the behavior of lenders and borrowers in a market which is characterized in a credit market with excess demand and restricted supply of credit facilities, similar to what is experienced by most small holder famers. There are three main items which banks mainly consider with respect to extension of credit to potential borrowers; interest rates, the amount of the loan, collateral required or the "stake" which a bank demands from a potential borrower to invest some "skin in the game". Depending on what rate is set for loans, it can have an adverse selection effect on potential borrowers. Interest rates can be used as a screening mechanism which differs depending on the risk level of a potential borrower. It is common practice amongst banks to request for collateral to secure most loans. However, increasing the amount of security required for a loan can have the effect of discouraging less riskier borrowers or can entice borrowers to invest riskier projects which could result in a bank's profits decreasing. In order to mitigate the moral hazard risk which may arise a borrower behaving irresponsibly with servicing of a loan, it is not uncommon for a bank to request a potential borrower to have an equity investment in a project for which a loan is required. This would enforce prudent management of the project and loan servicing.

Therefore, though there may not be necessarily be a shortage of funds to lend to potential borrowers, the due diligence conducted by banks when giving consideration to potential borrowers may cause the lenders to ration credit despite the existence of excess demand for loans.

The second theory is called the Joint Liability Theory which was put forward by Ghatak and Guinnane (1999). The theory articulates the challenges of extending credit to the poor and denotes that the four main problems faced by lenders are as follows:

2.4.1) Adverse Selection

The first problem identified by Joint Liability lending is Adverse Selection which emanates from asymmetric information due to limited information which the lenders may have or not have at all about the borrowers. The characteristics of a borrower may not be known to the lender or may not be obvious at all. In most cases, lenders carry out a due diligence on borrowers. However, as the business of lending carries certain risk factors, in effort to mitigate the risks associated with lending, lenders may request for collateral to mitigate the risks. However, the dilemma with this mitigating approach is that most poor borrowers may not have a bank acceptable collateral to secure a loan. However, as the poor in a community know each other's characteristics, they can vouch for each other as they know who can take on a higher risk. Therefore, the safe borrowers can subscribe for higher the risk, additionally joint liability contracts can restore full efficiency.

2.4.2) Moral Hazard

The second problem is called Moral Hazard which is builds its premise on the work of Ross (1973) and Jensen and Meckling (1976). The Moral Hazard problem is based on the principal-agency dilemma which describes the challenges from conditions of asymmetric information when a principal hires an agent. The problem is when the agent's motives are different from the interest of the principal. Mechanisms can be adopted to align the motivations of both the principal and the agent. The Principal-Agent problem theory is used to deal with issues of moral hazard. The motives of the borrower may be unknown to the lender. For example, the motive of the borrower may be to access credit but use it for different purpose which would not have been disclosed to the lender. Therefore, joint liability lending provides a mechanism through which peer or communal monitoring can ensure that the funds are used for the intended purpose and instils prudent management of credit facilities.

2.4.3) Costly State Verification

The third challenge under aforesaid theory is the Cost of State Verification. The process of verifying reports provided by poor borrowers can be very costly. Physical accessibility to the

location of the borrowers can be challenging as well because most borrowers would be based in rural location where access to their locations is not easy. Again, joint liability can be a mitigation factor for reducing expected audit costs improving efficiency.

2.4.4) Enforcement

The fourth and final problem is Enforcement. The theory suggests the enforceability of conditions of a loan are easier on for a group of borrowers with joint liability as opposed to single borrowers with limited liability. This option however, can prove to be a daunting and costly task.

With joint liability borrowing, a bank and community can impose sanctions on borrowers and this serves as a preventive mechanism to default on the credit obligations.

2.4.5) The Theory of Consumer Utility Maximization

In addition to the above two theories which look at the identification of eligible borrowers and alignment to the lenders' requirements, the choice by borrowers to either access finance or not, and their effective use of financial resources is affected by a host of factors. Understanding this choice from the perspective of smallholder farmers and the factors affecting the choice, requires guidance by the Consumer Maximization Theory. This theory seeks to explain how a smallholder farmer makes different choices in order to maximize their utility. The decision of a given farm household will be considered to be discrete. For any rational farm household, if accessing credit is seen as a possible choice, then such a farm household is expected to choose to access finance to maximize their utility. According to Greene (2008), the aforesaid approach was based on the linear random utility assumption and is normally expressed as follows:

$$\begin{cases} U_{i0} = x_i'\beta_{i0} + e_{i0} \\ U_{i1} = x_i'\beta_{i1} + e_{i1} \end{cases}$$

Where;

U_{ij} is a measure of utility derived by farm household i from choosing alternative j (with the decision to access finance U_{i0} while that to not to is denoted by U_{i1}), x_j is a vector of characteristics specific to farm household i as well as attributes associated with alternative j and specific to the i^{th} farm household, β is a vector of unknown parameters, e_{ij} is the random disturbance associated with the choice of alternatives j by farm household i.

The probability that farm household i chooses a particular alternative (i.e $Y_i = 1$) versus another (i.e $Y_i = 0$) is associated with the probability distribution of the error differences in the expected utilities from the choices and given by:

P_i = prob($Y_i = 1|x$) = prob ($y_i^* > 0|\ x$) = prob [$e_i > -x_i'\beta|\ x$] = F ($x'\beta$)

From the above stated equation, F is the cumulative distribution function of e_i (=e_{i1}- e_{i0}) evaluated at $x_i'\beta$, and y_i^* (=U_{i1} - U_{i0}) is a latent variable, since it is unobservable, and is linked to Y_i, the observed binary variable, through the relation below:

$$Y_i = \begin{cases} 1 \ \ if\ y_i^* > 0 \\ 0 \ otherwise \end{cases}$$

The specification of a model to describe the relation between the probability of choosing an alternative and the explanatory variables is dependent on the assumption made regarding the distribution of the error term. As this is a non-linear model, the effect of the explanatory variable is measured in terms of marginal effect which is the partial change in the probability of the outcome variable as a result of a change in the explanatory variable.

If the error term in the utility model is assumed to be normally distributed, then the analysis can be conducted using univariate or multivariate regression models.

The above theories focus on two players in the market; the borrowers who we have defined as small holder farmers and secondly the lenders who are a wide range of financial service providers as defined below. We look at the structure of the structure sector to better understand which institutions which have less stringent measures to support the accessibility of financing by SHFs.

2.5 Overview of the Agriculture Sector in Zambia

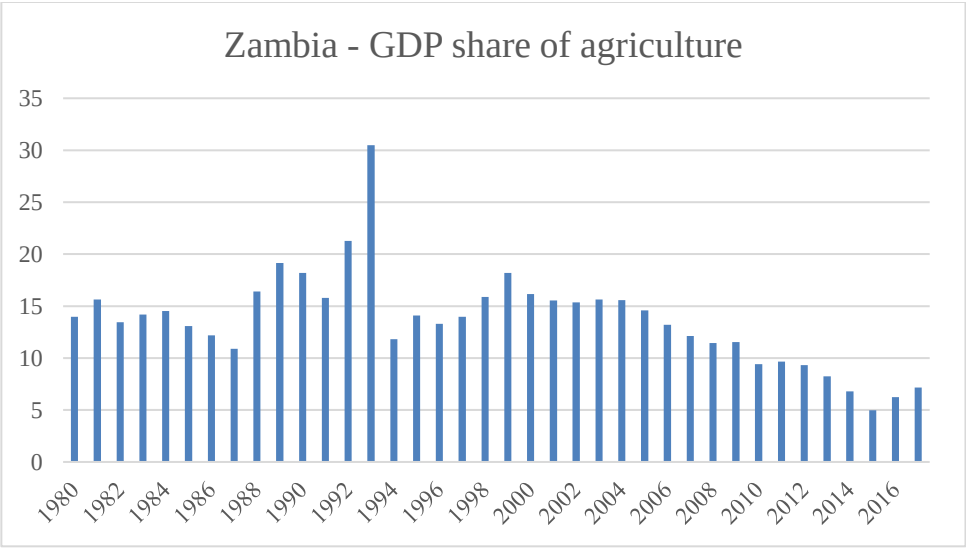
Zambia is a wealthy country with forty-two million hectares of land resources, however less than 4% of the land is cultivated every year. This country is richly supplied with water resources, hosting forty percent of the water in Central and Southern Africa, it therefore has the base to invite investments in advanced irrigation infrastructure and reduce dependence on rainfed crops. The agriculture sector in Zambia includes crop production, livestock farming and fisheries. Crop production comprises of largely maize, millet, sorghum and cassava which are mainly cultivated by smallholder farmers mainly for subsistence consumption with surplus stock off-loaded to the wider market. On the other hand, large scale farmers mainly produce for commercial purposes for the export market supplying maize, wheat, sugar, soya beans, coffee, cotton, groundnuts and rice including horticultural products. Agriculture contributes about 19%

to GDP and employs three quarters of the population (Export Gov, 2017). The agricultural sector continues to be the mainstay of Zambia's economy contributing to the development of the country's economy and ultimately having a positive impact on the Balance of Payments position.

In 2018, the national budget for Zambia was premised on five strategic pillars, two of which were (i) Economic diversification and job creation; (ii) Reducing Poverty and Vulnerability; (PWC 2018). With reference to the aforementioned pillars, Zambia is heavily reliant on export proceeds from the mining sector, and has left the country susceptible to external shocks. Thus, diversifying the economy by investing more in the agriculture sector can achieve both pillars. Furthermore, beyond diversification into agriculture sector, crop diversification is a necessity as Zambia mainly produces maize.

Despite the vast potential, agricultural productivity still remains very low in Zambia having contributed only 4.9 percent to GDP in 2015 compared to 14.5 percent in 2005.Over the period from 1980 to 2017 (Figure 1 below), the average contribution to GDP from the agriculture sector was 13.7 percent with the lowest contribution in 2015 of 4.98 percent and an all-time peak of 30.5 percent in 1993. Over the past ten years the contribution of the sector to GDP has declined significantly by 40.9 percent. (World Bank). The decline in productivity is due to the several factors coupled with over reliance on rain fed crops such as maize notwithstanding that the sector provides the largest employment in the country with seventy percent of the labour force engaged in agricultural activities.

Figure 1: Zambia – GDP share of agriculture



Source: The World Bank

2.6 The Financial Sector and Agricultural Financing in Zambia

The financial sector in Zambia is split into two sub-sectors which are Financial Institutions (FIs) and Non-Bank Financial Institutions (NBFI). FIs consist of commercial banks and Zambia currently has 17 commercial banks operating in the market and the FIs being the larger of the two sub sectors. The NBFIs comprise of seven classes which are Micro Finance Institutions (MFI), Leasing and Finance Companies, Building Societies, Development Finance Institutions (DFI), Savings and Credit Institutions, Credit Reference Bureaux (CRB) and Bureaux De Change. The overall financial performance and condition of the banking sector for the year ended 31st December 2017 was described as satisfactory based on a strong capital adequacy position, satisfactory earnings performance and a liquidity position which was satisfactory as well. However, there was a deterioration in the sector's asset quality due to a high level of non-performing loans (NPL) noted in the table below:

Table 2: Yearly Bank Performance

Performance Rating	Number of Banks			% of Total assets			% of Total Deposits		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Satisfactory	10	10	9	87.3	86.1	82.3	88.1	88.4	83.7
Fair	4	6	3	5.2	11.6	3.9	5	8.6	3.6
Marginal	3	1	3	5	0.3	8.8	3.9	1	7.8
Unsatisfactory	2	1	2	2.5	2	5	3	2	4.9
Total	**19**	**18**	**17**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Bank of Zambia

The number of operating commercial banks reduced to 17 at end-December 2017 from 18 at end-December 2016 following the merger of two banks in the market. Of the seventeen commercial banks, eight were foreign owned subsidiaries, seven were locally-owned private banks and two were quasi- Government (BOZ Annual Report, 2017)

Micro Finance Institutions (MFI) is a growing sector in Zambia with some of the institutions competing favourably with commercial banks. Microfinance is an effort to provide financial services to micro-enterprises which typically are not able to access financing from commercial banks. The micro-enterprises are generally low-income, enterprise owners with no conventional property title deeds and with limited identification documents. On the other hand, a provider of microfinance services may be include commercial banks, NGOs, cooperative banks all of which attempt to avail these services to the low income population in the market. The providers have

specialized financing programmes most of which have exorbitant profit margins[10]. Microfinance is a powerful instrument of funds disbursement to support micro-enterprises, with special focus on empowering women and helping to alleviate poverty and has now been fused into the mainstream of the financial sector. Commercial microfinance was pioneered by IFC in the 1990s with innovative solutions with policies which imbedded the aspect of financial inclusion to increase accessibility of financial services for the population which are traditionally excluded by traditional commercial banking services[11].

In Zambia micro credit is defined as "a credit facility that does not exceed five per centum of the primary capital of a licensed microfinance institution, as prescribed by the Bank of Zambia. A microfinance institution means a person who, as part of their business, advances micro credit facilities. A microfinance service means the provision of services primarily to small or micro enterprises or low income customers and includes the following: (a) the provision of credit facilities usually characterized by frequent repayments; and (b) the acceptance of remittances and any other services that the Bank of Zambia may designate". Zambia has a total of 34 registered micro financial institutions.

The second class of NBFIs is Leasing and Finance Institutions. In 2017, the overall performance of this sub -sector was rate unsatisfactory including the regulatory capital adequacy, asset quality, and earnings while the management of liquidity was rated as fair. There are a total of 8 registered leasing and finance companies in Zambia.

In Zambia there are only three registered building societies which are the Zambia National Building Society which is quasi- government, Finance Building Society and Pan African Building Society.

Other classes of NBFI are Savings and Credit Institutions of which Zambia has only one which is the Zambia National Savings and Credit Bank. There are also 80 registered bureau de change and one Credit Reference Bureau

[10] Microfinance: A Critical Literature Survey. https://openknowledge.worldbank.org/bitstream/handle/10986/23546/Microfinance000al0literature0survey.pdf?sequence=1&isAllowed=y

[11] Microfinance. https://www.ifc.org/wps/wcm/connect/Industry_EXT_Content/IFC_External_Corporate_Site/Industries/Financial+Markets/MSME+Finance/Microfinance/

The above-mentioned key financial sector players provide the bulk of agriculture finance to SHFs in Zambia.

The last class is the Development Finance Institutions (DFI) and there is only one DFI in Zambia which is the Development Bank of Zambia (DBZ) which is also quasi government. With respect to the current shareholding, the majority shareholder is Government of the Republic of Zambia with 63.53 percent followed by the Export-Import (EXIM) Bank of India with 19.73 percent and the Development Bank of Southern Africa which holds 9.44 percent. As would be expected, DBZ equally prioritized lending to the agriculture sector to align it to the revised Sixth National Development Plan (DBZ AFR, 2016). Though Zambia only has one DFI, there are foreign investors who participate in Zambia. The development financial systems are also categorized as follows:

Table 3: The Development Finance System

<table>
<tr><th>Bilateral Institutions</th><th>Private Commercial Sector</th><th>Multilateral Institutions</th><th>Global Funds</th><th>NGOs</th><th>Private Philantrophy</th></tr>
<tr><td>CDC UK</td><td>Firms eg FDI, CSR</td><td>The World Bank, IMF</td><td>Global Environment Facility</td><td>International NGOs - CARE Int, PLAN Int, Oxfam</td><td rowspan="2">Bill and Melinda Gates Foundation; Ford Foundation; Wellcome Trust</td></tr>
<tr><td>AFD/PROPACO</td><td>Commercial Banks eg loans, export credit, export guarantees</td><td>Asian Infrastructure Investment Bank, New Development Bank</td><td>The Global Fund, GAVI</td><td>National NGOs in Donor Countries</td></tr>
<tr><td>KFW/DEG/ NORFAD</td><td rowspan="2">Private Investors eg portfolio and equity investments</td><td>UNDP and other banks Isamic Development Bank</td><td rowspan="2">UN Special Agencies</td><td rowspan="2">National NGOs in Developing Countries</td><td rowspan="2">Household remittances and other private transfers</td></tr>
<tr><td>Emerging Donors eg China*, India, Brazil, South Korea</td><td>Regional DFI - ADB, AfDB</td></tr>
</table>

Source: GSB, UCT

With Zambia only having one Development Financial Institution, there are selected key cooperating partners who are expected to provide assistance to the development of the agriculture sector in Zambia; these development partners are the European Union, the World Bank, the World Bank's International Finance Corporation, Irish Aid, the USAID, CGIAR, SIDA, DFID, NORSAD, UNICEF, Bill and Melida Gates Foundation and the World Food Programme.

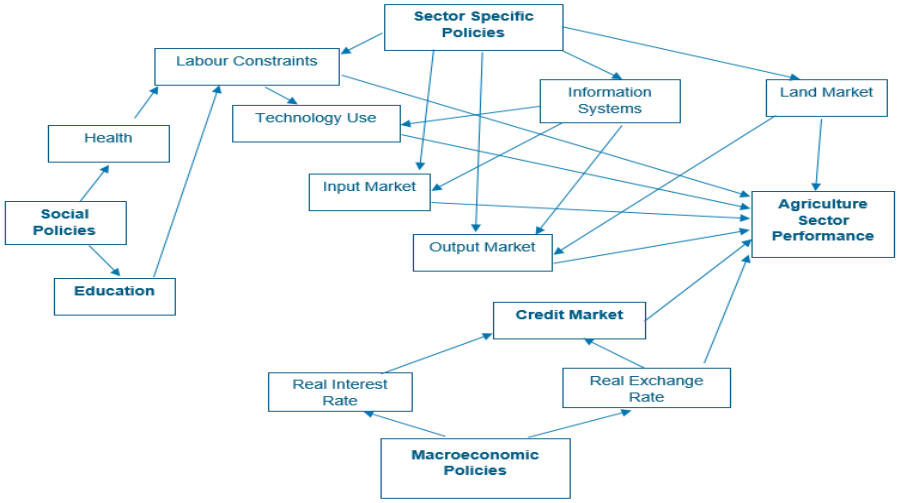
Table 4: Proposed DFI/NGO Program Areas

Proposed Program Areas	Key Donor Investments	Who?
Oil seeds and legumes	Conservation agriculture promotion	European Union, NORSAD
Maize	ZAMACE procurement and storage	World Food Programme, Irish Aid
	Drought tolerant maize/tropical legumes	CGIAR
Horticulture	Peri-urban smallholder irrigation	The World Bank, International Finance Corporation
	Market infrastructure upgrade	European Union, The World Bank, International Finance Corporation
Enabling environment	Agriculture policy support and advocacy	Sida
	Capacity building in Ministry of Agriculture and Co-operatives (MACO)	European Union, The World Bank, International Finance Corporation
	Feeder roads in Eastern province	The World Bank, International Finance Corporation
	Smallholder financial services	Irish Aid
Economic resilience and nutrition	Food vouchers and/or school feeding	World Food Programme, European Union
	Scaling up Nutrition (SUN)	Irish Aid, UNICEF, DFID
	Poverty reduction and social nets	Irish Aid, NORAD, DFID

2.6.1) Government Support Structures and Policies

The diagram below depicts the policies and other major factors which impact performance of the agriculture sector in Zambia. These include, social policies, macroeconomic factors, labor constraints, credit market, land markets, input market, output market and technology usage, all have a direct impact on the agricultural development in Zambia- as in most other developing countries in Africa- (Juliet et al, 2016).

Figure 2: Policies impacting the agriculture sector performance



Source: Wichern et al (1999)

Between the period 2000 and 2010, Zambia's macroeconomic landscape was stable with an impressive average growth rate of 7.75 per annum which elevated the country into lower end of middle-income countries. However, in 2015, the country was hot with a drought which led to a reduction in the maize yield by 21% thus significantly impacting the growth of the sector which mainly produces maize. During the same period, the drought caused an energy crisis with load shedding periods as long as 10 to 14 hours per day, whilst the price of copper slumped negatively impacting the exchange rate and this leading to a depreciation of the Kwacha by 50% against the dollar. This caused the cost of importing goods to become very expensive this was further amplified with the tightening of the monetary policy rate by to 15.5% per annum from 12,5% per annum in an effort to curb inflation which had risen to double digits of 21% in 2015 from a single digit of 7.9% in 2014 (AFDB). Whilst the economic fundamentals continued to spiral, the commercial bank lending rates rose significantly, averaging around 28.9 percent in September 2016. These credit lending rates were exorbitant for the Small and Medium Enterprises (SMEs) thus stagnating the growth of the economy as a whole (Zambia National Budget, 2017).

The government of Zambia supports smallholder farmers with accessing finance indirectly by supplying inputs at affordable prices and presenting an off-taker (output) market for their produce. Through the Ministry of Agriculture, the government has continued to provide subsidies to SHFs for input supplies such as fertilizer, seed and chemicals through a program called the Farmer Input Support Program (FISP) which was implemented in the 2015/2016 farming season. This program has helped to alleviate the burden of SHFs seeking finance for the purchase of inputs. In an effort to automate the distribution of cash for inputs, the ministry introduced an e-voucher system where selected farmers receive their allocations though prepaid cards which they in turn use to purchase inputs of their choice from approved participating agro dealers.

For the 2017/2018 farming season, 716,000 farmers were beneficiaries for this programme through the e-voucher system and a total of 5,800 agro dealers participated thus helping to promote crop diversification within the sector. However, the programme has not been well executed as it has over the years, particularly for the past farming season, 2017/2018 which was been marred with input distribution irregularities, delays, telecommunication connectivity challenges, financial services provision limitations and limited information technology.

Moreover, the ministry is exploring different avenues for reducing reliance on rainfed crops and promotion of crop production all year round through investment in irrigation infrastructure for which 4 districts have been identified which will add 3,000 hectares of irrigation largely for smallholder farmers (GRZ National Budget, 2018). How then does the Ministry of Agriculture (MoA) identify the targeted beneficiaries for the FISP? The identification of beneficiaries is done through Camp Agricultural Committees (CACs) which constitutes of players such as agricultural cooperatives, a representative of an area chiefdom, Camp community based organisations, representative from MoA and other appropriate civil servants other than those from MoA (IAPRI, 2013)

This type of support to the farmers creates a form of value chain financing; out-grower schemes through partnership with the private sector or outright support by multinationals has the capacity to expand value chain financing. Perhaps consideration should be given by the government to formulate policies for foreign investors to support the communities in which they operate by implementing out-grower schemes to upskill the SHFs through improving their agricultural practices, technical knowhow, facilitating access to information. They too can partner with telco to provide cheap phones through which information can be availed in local languages.

Currently there is readily available off-taker market for the produce by SHFs through the Food Reserve Agency (FRA) which buys maize of up to 500,000 metric tonnes annually for Zambia's strategic food reserves. The government also allows the private sector to purchase directly from the SHFs, however, the private companies often do not have the logistics to reach the SHFs in far flung remote areas; this is where the FRA comes in to sweep excess crops which may not have been bought to avoid wastage and as a way of supporting SHFs. More can be done to present a wider output market such as exports within Sub Saharan Africa and globally. This output market is heavily dependent on Zambia diversifying beyond maize produce. Both the FRA and private sector can create opportunities for the export of excess crops in seasons of bumper harvests. ZCF too has the potential to create a platform to facilitate exports of the agricultural produce from smallholder farmers, not only would this further grow the agricultural value chain but it would also empower the local SHFs. Use of mobile money networks by agricultural bodies such as FRA, MUSIKA and ZCF for payments to smallholder farmers for the purchase of their produce would create track records of these farmers and build on formal

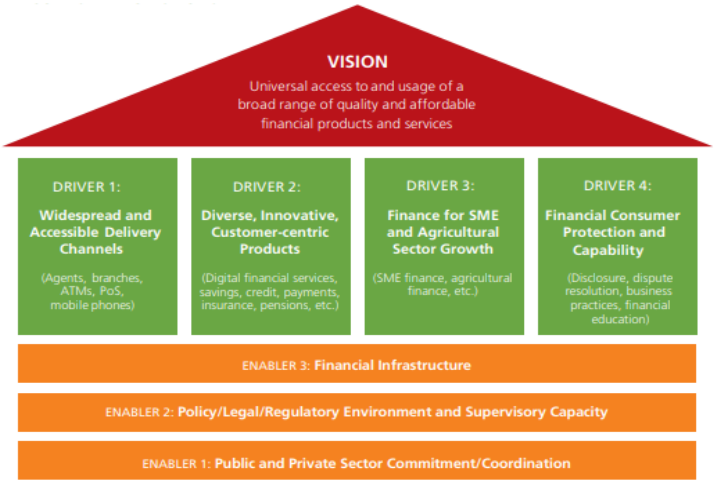
records which would be required to lend to farmers. In addition, it would bring about other benefits such as reduced cash handling risks faced by payout of physical cash to farmers and would also increase awareness for the necessity to save through mobile money use.

2.6.2) National Financial Sector Development Policy and National Financial Inclusion Strategy

According to the Findex Data about 1.7 billion people are still unbanked; financial inclusions features predominantly in eight of the seventeen SDGs as it is a driver for poverty alleviation, promoting food security and growth of sustainable agriculture[12] . The Government of Zambia launched the National Financial Sector Development (NFSD) Policy and the National Financial Inclusion Strategy (NFIS) in November 2017. The National FSD Policy provides strategic guidance and an overall framework for developing the financial sector. To compliment the NFSD is the NFIS whose primary objective of is to achieve universal access to and usage of a broad range of quality and affordable financial products and services. The NFIS bolsters the financial inclusion roadmap which helps the unbanked to be integrated into the financial sector and in turn enhances economic growth, wealth creation, economic growth and sustainable development. The main benefit of financial inclusion is that it facilitates a means for the unbanked to save to save the unbanked, access credit, make payments and have access to various investment products and for more advanced sectors the unbanked can have access to the capital markets.

[12] http://www.worldbank.org/en/topic/financialinclusion/overview

Figure 3: Zambia – Key Enablers of the National Financial Inclusion Strategy Framework



Source: National Financial Inclusion Strategy 2017-2022

Figure 3 maps out the key enablers on which the NFIS Framework is built. A solid foundation is required to achieve the NFIS vision of universal access to and usage of a broad range of quality and affordable financial products. The three key enablers of the NFIS framework are: (i) Public and Private Sector Commitment and Coordination; (ii) Policy, Legal, and Regulatory Environment and Supervisory Capacity; and (iii) Financial Infrastructure. Strengthening these Enablers will provide the foundation for a healthy and inclusive financial sector. The Framework also outlines four key Drivers: (i) Widespread and Accessible Delivery Channels; (ii) Diverse, Innovative, and Customer-Centric Products; (iii) Finance for SME and Agriculture Growth; and (iv) Financial Consumer Protection and Capability; noting the importance placed on the contribution of the agriculture sector to the overall growth of the economy. Of particular importance to this study is Driver 3: finance of SME and agriculture sector growth, as government permeates funds into this sector they can be able to tackle current bottle necks and improve the sector. The policy objectives of this pillar include: improve knowledge of governance of rural SMEs and their cash flow management, build capacity of financial service providers to lend to SMEs and to farmers, improve government-supported SME and agricultural finance schemes, support growth in financing agriculture value chains, develop financing instruments that meet SME/ agricultural needs, and improve credit reporting systems (NFIS, 2017). Furthermore, the government though the Bank of Zambia needs to consider how to integrate the unbanked SHFs into the financial sector. One way of doing this is through the growing partnerships between commercial banks and the telecommunications companies by

making use of mobile money services. These sorts of partnerships speak to the international calls for financial inclusion as there is need to deploy technology to reach the unbanked through cost efficient channels whilst improving the turnaround time for disbursement of funds to SHFs in remote locations where there is no physical presence of financial institutions. Not only would the use of mobile money create a network reach to the unbanked SHFs, it would promote the need for quicker development of a credit registry for smallholder farmers within the exiting financial sector for credit assessment purposes (IAPRI, 2018).

For practical agricultural policies, perhaps Zambia can leverage off the expertise of the International Finance Cooperation which successfully develops and implements agriculture finance policies and procedures which incorporate the private sector, facilitate access to appropriate financial products for farming borrowers, particularly small and medium enterprises (SME). The objective of focusing on enhancing agricultural SMEs is to boost the agricultural productivity and income of this segment of the agriculture sector and attain economies of scale for SMEs. Moreover, to build the value chain system to support the production cycle and marketing of companies in the agriculture sector to build a stable and secure presence in the region.

The growth of the SME agriculture sector requires a strong backbone of effective policies. Leveraging off the expertise of development finance institutions such as the World Bank which provides policy guides on agriculture financing and insurance. We thus look at some of the world bank policy guidelines frameworks on agriculture finance and insurance (World Bank, 2018):

Policy and Regulatory Interventions on Agriculture Finance: this would involve investigative and identification of matters on the state of agricultural finance within client countries and produce concrete action plans to reform public policies and regulations in order to create an enabling environment to mobilize agricultural finance. Some of the policy interventions would make use of monetary policy instruments, warehouse receipt financing frameworks, and regulations governing out-grower schemes. As mentioned above, monetary policy tools can be used to curb lending constraints by introducing lending quotas and interest rate caps. However, in the spirit of increasing access to the credit market particularly for SMEs by lowering the cost of credit, these sort of policy interventions of interest rate capping should implemented cautiously to avoid the reverse happening. A case in point is the Kenya Banking Amendment Act 2016 which was implemented to set a cap on lending and deposit rates. The effect of this law was adverse; some of the effects were a) contraction of credit to the private sector as the

credit risk for some of the borrowers is above the interest rate cap, b) declining profits for the banks due to declined net interest income and asset growth, c) undermining of the independence of the Central Bank (Central Bank of Kenya, 2018).

Strengthening of Relevant Institutions: The World Bank provides expertise which can help to reform and strengthen government institutions, conduct programs targeted on financial cooperatives as they are strategic to organizing formal groups of SHFs, rural agricultural MSMEs and households establish commodity exchanges, and to build capacity of MFIs and other institutions. This sort of policy helps to facilitate integration into a domestic financial system. With respect to establishment of commodity exchanges, Zambia enacted the Agriculture Credits Act law in 2010 to implement a Warehousing Licensing Authority but the Statutory Instrument was only issued in 2014; even then there were political disruptions which delayed the operationalization of ZAMACE until 2017. The Act attempted to address market issues of credit rationing, information asymmetry, costly state verifications and enforcement. However the running of ZAMACE has not been without challenges which have been identified as mainly: i) market size which is dominated by SHFs who require significant sensitization and participation by the FRA in the exchange as the only buy from SHFs for strategic reserves; ii)government intervention – the absence of concrete agriculture polices which would provide more confidence to the market players with respect to, for example, the role of the government in grain marketing, consistency export quotas and licenses and adoption of similar policies as that of SAGIS and CEC in South Africa; and iii) Financial sector participation – best practice in the other markets is to have banks as shareholders in the exchange, the backing of banks gives confidence to other players in the market and would give ZAMACE a stronger governance structure. (CUTS International, 2018)

Developing Innovative Products: the World Bank supports the development of structured products such to increase access to financing particularly through using the underlying asset being financed as the collateral though for example financing against warehouse receipts with a collateral management agreement (CMA) or stock monitoring agreement (SMA), value chain finance, inventory finance (examples include warehouse receipts, CMA, and SMA), partial credit guarantee schemes for agriculture-sector loans, appropriate grants, agricultural insurance for crop cultivation and post-harvest, commodity hedging instruments and financing to promote women in agriculture. Promotion of digital solutions is a fast-growing platform particularly in developing countries. Such platforms are mobile banking and mobile money payments which

has seen the growth of financial inclusion in countries like Kenya (M-PESA), reducing transaction costs, cash handling risks and growing the ecosystem of anchor companies. In Zambia, in an effort to integrate the unbanked into the financial sector, the use of mobile money is fast growing as well. It also speaks to governments efforts of financial inclusion. In 2016, the Bank of Zambia under Circular 01/2016, revised the transaction and balance limits for mobile money issuers and money transfer businesses. The objective of the upward revision was to encourage more use of digital platforms in the market.

2.6.2) Agricultural Financing

Agricultural credit for SHFs is mainly provided in rural areas in the form of cash or in kind through supply of inputs to SHFs through for example out-grower schemes in exchange for the harvested crop which would be sold to the lender who in most cases is the off-taker of the crop as well. The lender would pay the SHFs in the out-grower scheme a mark-up on the cost of the crop. Agriculture finance is strategically vital for alleviating acute poverty and increasing wealth. There is an estimated 500 million smallholder farming households globally, representing 2.5 billion people reliant in various ways on agriculture for their livelihood. Agriculture finance will empower less privileged farmers to increase their wealth and food production to be able to feed at least nine billion people by 2050 (World Bank, 2018). Over the past years, extension of credit to the agricultural sector in Zambia was significant in comparison to the other sectors; it has however declined over the past 10 years in relation to the total bank lending. In 2006, bank lending to the agricultural sector was an estimated 25% of all bank loans; ten years later it significantly dropped to a worrying17.1%. Agriculture is a key sector which could help diversify the Zambian economy which is heavily dependent on the mining sector. In addition, it is one sector which is strategic for achieving SDG 1, poverty alleviation which cannot be emphasized enough. (NFIS, 2017).

Between the 1980s and 1990s, traditional lending to smallholder farmers in Zambia was mainly sourced from three agricultural institutions which were the Credit Union and Savings Association (CUSA), the Zambia Co-Operatives Federation Finance Services (ZCF-FS) and Lima Bank; all of which mainly issued short term loans to farmers. The Government of Zambia allocated an estimated twenty percent of the agriculture expenditure to an estimated twenty percent to the three institutions annually. However, various factors led to the collapse of the institutions. Bad performing loans, poor profitability lines from the borrowers, extension of clean credit facilities to SHFs and the subsequent freezing of funding of the three institutions largely contributed to the demise of the institutions. The collapse of the institutions drastically

reduced credit to SHFs in the market leaving only eleven percent accessing loans in the 1990s (Wichern, 1999).

Therefore, efforts to increase agricultural financing for the smallholder farmers will require a more organised structure for the farming community in commercially orientated groupings such as cooperatives which would make it easier for them to access loans directly from financial institutions (IAPRI, 2018). In the same vain, the organized structures would help curb the challenges of costly state verification. In the agriculture sector's current form, attempts to increasing financing will continue to be a challenge particularly from the commercial banks due to the various high risks associated with the sector. Well established cooperatives is one way of addressing the challenges presented under the Joint Liability theory of adverse selection, moral hazard, costly state verification and enforcement.

2.7 Factors Influencing Access to Finance for Agricultural Growth

In Enterprise Survey conducted by the World Bank in 2013 which revealed that the biggest constraints for firms to grow in Zambia was firstly access to credit where 27.5% of firms reported that it was the main the main barrier; second to access to finance was limited record keeping skills and inadequate corporate governance knowledge of the informal sector listed at 22.5%. Further investigations showed that 53% of small firms (enterprises with 5–19 employees) who recently applied for loans were declined, 9% of medium-sized firms (20–99 employees) and zero of the larger firms (100+ employees) had their loan applications declined. However, where the credit facilities are approved, the cost of borrowing exorbitant which puts a further strain on the capacity of smallholders to meet their loan obligations. It was reported that interest rates offered by commercial banks were as high as 40%, whilst those offered by the micro-finance institutions were an astonishing 70%. In Zambia, access to finance for smallholders is restrictive due to the informal structures of the enterprises, the significant collateral required by lenders and unsuitable lending products offered by banks to SMEs. (World Bank, 2013).

2.7.1) Cost of Credit

While agriculture is the mainstay of most economies in Africa, employing 55% of the continent's population, banks extend only approximately 1 percent of its lending to the agricultural sector. Furthermore, in developing countries globally, only 4.7 percent of adults in rural areas have a credit facility from a formal lender

and only 5.9 percent have a bank account[13].

One of the macro-economic indicators which impact the agriculture industry significantly is interest rates because it affects the cost of borrowing money. As the agriculture industry is a capital-intensive sector, fluctuations in interest rates directly impact profitability of the industry.[14]

Agriculture is an inherently risky economic activity. A wide range of factors can affect output production and prices. In developing countries, farmers also lack access risk management mitigation tools such as such as agricultural insurance, futures contracts, or guarantee funds. Some of the reasons why formal lenders avoid extending credit to the agricultural sector is because of high cost of service delivery, information asymmetries, lack of branch networks, perceptions of low profitability in agriculture. However, the predominant reason is the high degree of uncontrolled production and price risk that industry is exposed to. Consequently, formal lenders tend to overemphasize the use of immoveable collateral as the primary buffer against default risk, thus excluding farmers who do not have sufficient collateral as most SME farmers do not have secured-title land, which is the preferred type of collateral; and if at all they do have secure title land, the value may be insufficient to cover a loan. The result is limited supply or access to formal agricultural financing, even though much of the population of Sub-Saharan Africa and South Asia is rural and depends on agriculture and livestock rearing for their main livelihood activities (Wenner, Mark D., 2010)

The pricing of credit facilities is largely based on the cost of assessing and protecting against default risk. Over the period from 1966 to 1985 it is estimated that default costs are at 29 basis points. Therefore, riskier borrowers are charged higher rates because lenders are exposed to a higher expected default cost (Brent et al, 2005). Like most developing countries, Zambia also has exorbitant interest rates which cripple the ability of potential borrowers to access agricultural financing particularly from the formal financial sector such as commercial banks. The objectives of financing for agricultural purposes is for capital investments in equipment and vehicles and working capital support mainly for cultivation and operational expenses (Sebatta *et al*, 2014). However, Diagne and Zeller (2001) conducted a study where they found

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[13] Access to Finance for Smallholder Farmers: Learning the Experience of Microfinance Institutions in Latin America.

Available at:

https://openknowledge.worldbank.org/bitstream/handle/10986/21679/949050WP0Box3800English0Publication.pdf?sequence=1

1 [14] How Interest Rates Affect Agricultural Markets:
https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sis10122

that the level of interest rates charged on loans had no effect on households deciding in which microfinance institution to participate. Non-price attributes of credit institutions and their services such as the types of loans provided and the restrictions on their use, as well as the types of nonfinancial services provided such as training in the management of microenterprises play are more important when it comes to farmers accessing finance.

In addition, the high cost of credit, along with the lack of long-term lending, creates a vicious cycle. When interest rates are high, the probability that smallholder farmers will fail to repay their loans is increased, since their debt burden is higher relative to their incomes. High rates of non-repayment, in turn, encourage banks to raise the risk premium and charge higher rates. Similarly, when a farmer must repay a loan for purchase of capital equipment over one or two years instead of five, there is a greater chance that the farmer will not earn sufficient revenue to repay the loan on time. Delinquencies rise, which reinforces the banks' tendency to offer only short-term loans (ZNFU, 2010).

2.7.2) Collateral

Most SMEs encounter challenges with accessing credit facilities from formal credit lenders due to their inability to provide sufficient collateral, if any. Even in cases where some form of collateral is available, it is either insufficient or in a form which cannot be easily liquidated thus not making it acceptable for a lender (Jessop et al, 2012). Credit providers to borrowers in the agriculture sector have limited instruments to mitigate the various types of risks faced in agriculture lending, therefore the credit providers guard themselves through excessive credit rationing and lean more on traditional collateral such as real estate in urban areas which is preferred by lenders as opposed to borrowers' assets in rural locations. Additionally, rural assets are less desirable by lenders due to legal and administrative challenges coupled with cultural factors which make it more difficult to register such assets as collateral. Thus, in the event of default, it would be difficult to foreclose on a property in a rural area. Therefore, for a lender to grant credit to a borrower in a rural area the ratio of collateral to the financing amount tends to be much higher (IFC, 2011). Hansungule (2007), conducted a research in the Eastern part of Zambia which focused on factors affecting farmers access to credit and he found that collateral was an important factor which affected farmers when it came to accessing credit. Furthermore, it is vital that the borrowers do not just provide some form of collateral, suitable collateral which is acceptable to a bank should be provided; collateral can take various forms which can also include guarantors, properties and proof of income such as a pay slip (Njuguna & Nyairo, 2015). In a study done on traditional landholding certificates were introduced in Petauke district

in the Eastern Province of Zambia, one of the main purposes of the document was to quicken the resolution of land disputes when they arise amongst in a village which would be easily resolved by a chief (Green & Norberg, 2018). Similarly, in Chibombo district in Central Province in Zambia, land certificated were issued for the same purpose of dispute resolution. The issuance of these certificates is a step in the right direction for the agriculture sector as it provides a sense of security for smallholder farmers with respect to identifying their land, minimize land disputes and participate in longer term agricultural investments. Additionally, it speaks to gender balance for female land users over and above increasing land productivity and returns. These certificates, known as ParcelCerts, were processed by Madeem Zambia with logistical and technical support provided by MUSIKA. The next steps being considered under the Madeem process is the possibility of credit providers and input suppliers such as banks and agro dealers accepting the ParcelCerts as proof of ownership which can be used as collateral to source credit and inputs respectively.[15]

2.7.3) Literacy Levels

Another reason for reluctance by formal lenders to grant credit to borrowers in the agricultural sector the low levels of farmer education and financial literacy (Wenner, Mark D., 2010). SHF usually practice subsistence farming which has been done for generations. If SHF are to be competitive and be part of agriculture value chains, they are required to certain level of agricultural knowledge and management skills. In addition to lacking agriculture technical know how, SHFs often do not possess the business acumen and financial and accounting skills and medium-term strategy development.[16] Most smallholders have little or no formal education, many not having completed primary or secondary education and as a result, institutions struggle with the SHFs business partners' lack of capacity.[17] In Zambia, on average smallholder household heads had about 6 years of formal education; those we attained some level of primary education were more than 50%, whilst those we had secondary education were 24%. This data is similar in all the other provinces except for Eastern province which is very low at 14% more household heads with no education relative to other provinces (RALS).

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[15] Chief Liteta Empowers Subjects with Land Certificates: http://www.musika.org.zm/article/120-chief-liteta-empowers-subjects-with-land-certificates

[16] GIZ. 2012. Growing sustainable business with smallholders: A guide to inclusive agribusiness. Accessible at: http://www.agribusiness-with-smallholders.net/fileadmin/user_upload/publications/Guide-Growing_Business_with_Smallholders_large.pdf.

[17] Business Call To Action. Is Finance the Primary Binding Constraint for Smallholder Farmers? Retrieved from http://www.businesscalltoaction.org/sites/default/files/resources/SmallholderFarmingAndFinanceReport_0.pdf

2.7.4) Household Size

Household size refers to the number of adults in a particular home. Household size in agriculture can be a good proxy of labour available to perform various activities on the farm. In Zambia, the average size of each household is six family members. Thus, a household with a small number of adult members may be forced to access credit so as to make investments into labour requirements for improved production. Thus, households with a small number of households is expected to have a positive effect on access to finance as opposed to ones with large number of members.

2.7.5) Household Income

Income earned by small- scale farmers is also an indication of how well the farm business is doing at any particular moment. Thus, it is used by finance lenders to determine the ability of the borrower to back the loan within the stipulated and agreed time. Thus, a small-scale farmer with very low income is highly unlikely to access finance from banks or other lenders. This is supported by Korir's (2013) study on factors affecting access to finance, where it was determined that income was very important in credit access. Other studies have also revealed that high farm income and off-farm income make access to agricultural credit easier, this key ingredient positively influences access to formal credit (Denkyirak et al, 2016).

2.7.6) Age of the Household Head

The definition of population is based on the de facto definition of population as above. A young population refers to people between 0 and 14 years old, while an old population refers to persons who are 65 and above. (World Bank- WDI). The age of the household head is also critical when it comes to finance access. It is used by Banks and Microfinance Institutions when conducting their assessments on whether or not to give finance to a small-scale finance. Age can either have a positive or negative effect on the farmers' access to finance. Forty-eight is the average age of SH household heads in Zambia.

2.7.7) Gender of the Household head

Research conducted by Ali Chandio et. al. (2016) in Pakistani found that male headed households were more likely to access agricultural finance compared to their female counterparts. This could be attributed to various factors including the reason that in most societies (especially developing countries) males have easy access to bank finance requirements such as land (collateral) which is very important for one to access credit. In contrast, Sebatta *et al* (2014), it is reported that there was a notable difference between female farmers who had

access to credit compared to their counterparts who had no access to loans. However, the access to credit by female SHFs is still low because most access to credit facilities has been dictated by cultural norms in which obtaining of loans be endorsed by their husbands. Ironically, if women did not seek consent from their spouses, they have the potential to create job opportunities which would then have a more significant and long-term impact on child health, nutrition and education.

2.7.8) Proximity to Urban Center

In most communities in Zambia and other developing countries, urban centers are where most financial institutions are located. Thus, farmers closer to these centers have a higher chance of accessing credit compared to those located far off. This is mainly due to the reason that finance lending institutions as indicated in the earlier section, incur a lot of costs when processing loan applications especially for clients located in far off areas. This is supported by Lemessa and Gemechu's (2016) in Ethiopia, showed that physical distance between the farmer and lending institution affected access to finance.

2.8 Related Studies

Similar studies aimed at identifying factors that affect small scale farmer's access to finance have been conducted globally, in Africa as well as Zambia specifically. These studies have all produced varying results. For instance, Chandio *et. al.* (2017), conducted a survey in Pakistan to identify factors affecting access to finance zeroing in on the question of what mattered the most between collateral and cashflow when it comes to farmer's access to finance. Results from this study showed that gender, household size, education level, farming experience, farm size, income, and availability of collateral had a positive effect on farmer's access to finance. On the other hand, the study revealed that age of the household head had a negative effect on small scale farmers access to credit. The study ultimately indicated that only farmers with collateral, high income and large land holding size were capable of obtaining formal credit. In Mozambique, Osano and Languito conducted a study which looked at factors that affected SMEs access to finance and they found that there was a relationship between collateral requirements and access to finance. In addition, Elias et al (2015), identified the determinants of access to agricultural credit for small and marginal farmers' in India. In this study age, gender, level of education, family size, landholdings, irrigation facilities, income level, marital status and occupation According to the authors, out of these variables' landholdings, educational status, irrigation facilities, income level and gender were found to be the significant

factors in determining the agricultural credit access of the small and marginal farmers from banks (Elias et al, 2015).

Lemessa and Gemechu (2016), analysed factors that affected farmer's access to formal credit in Ethiopia and found that 34.5% of small scale farmers had access to finance. Furthermore, the study revealed that credit access by female headed households was limited compared to male headed households. In addition, Lemessa and Gemechu reported that frequency of contact with development agents, physical distance of farmers from lending institutions, family size, farm size, experience in credit use from the formal sources, sex of household head, education level of household head, participation of households in extension package program, attitudes towards Risk, farmers' perception of Loan repayment period, farmers' perception of Lending procedures, lack of opportunity to take a second loan , and membership of farmer's multipurpose cooperatives were important factors influencing formal credit access and use by SHFs. Temesgan *et al* (2018) also in Ethiopia conducted a study which analyzed the factors that affected credit access by smallholder farmers. The results indicated that education of the household head, frequency of extension contract and farmers' perception of group lending were positively and significantly affected households' participation in credit access while household size and distance from MFIs were negatively and significantly affected households credit participation in the study area (Temesgan *et al* 2018). In another study conducted in Ethiopia, Yehuala (2008) conducted a study on determinants of smallholder farmers' access to formal credit. The author found that participation in extension package programs, experience in credit use from the formal sources, total cultivated land size, number of livestock owned, collateral or group formation and membership were highly important in influencing access to formal credit use (Yehuala, 2008). In a similar study by Njuguna and Nyairo (2015) on formal conditions that affect agriculture credit supply to small-scale farmers in rural Kenya showed that the requirement for suitable collateral by banks affects the ability for smallholder farmers to access credit. Furthermore, Ferede (2012), researched on determinants of rural households' demand for and access to credit in Ethiopia. Results revealed that family size, marital status, religion, education, cultivated land size and live stock ownership were the main determinants of credit demand while age, education, cultivated land size and distance are the important determinants of credit access. It was also found that, interest rate, group lending and the loan disbursement period are factors that negatively affect the demand for credit. Rural farmers indicated that loan processing time, loan size, the compulsory saving and the loan repayment period are some important areas that MFIs needed to improve on (Ferede, 2012).

In addition, Kiplimo et al (2015), conducted a study which focused on evaluating the factors that affected smallholder farmers access to finance in the Eastern part of Kenya where he found that the level of education of the household head was significant in determining access to agriculture finance. Also, Mbuba *et al* (2018) conducted an analysis of factors influencing microfinance credit uptake among smallholder coffee farmers in Kenya and results indicated that coffee farming experience, gender of the household head, number of coffee trees and access to extension services had significant influence on the uptake of microfinance credit in the aforesaid country.

In another study conducted by Korir (2013) which aimed at analysing factors that affected access to credit, it was revealed that information availability, collateral and income levels were key factors when it comes to credit access. The study also showed that distance to credit sources, past credit participation and assets owned was important in determining credit finance access. Further, Muhongayire (2012) looked at factors that affected access to finance in Rwanda and results indicated that off-farm income, agricultural extension service, participating in informal credit and education level of the household head were important in determining access to finance. The author further found that farmers earning more off-farm income increased the likelihood of participating in formal credit by 4.6 percent. In addition, farmers with higher levels of education and those who receive technical advice from agricultural extension workers were more likely to access finance than those who did not (Muhongayire, 2012).

Jalil (2015) conducted a study in Ghana which looked at determinants of finance access among smallholder farmers and impact on food security. Results indicated that factors such as age, male-headed households, household size, education, farm size and farmer-based organization membership positively affected access to credit and subsequently food security. The author's results also showed that institutional factors such as credit worthiness and guarantor had positive effects on access to credit and food security (Jalil, 2015). Similarly, Madafu (2015) conducted a study in Tanzania which looked at access to bank credit by smallholder farmers. Results revealed that the value of assets invested in farming activities and education were significant factors affecting smallholder farmers' access to bank credit and; lack of collaterals, vital bank information, proximity to banks and high interest rates were some among the major obstacles hindering smallholder farmers' accessibility to bank credit. Further still, access to bank credit was found to have a significant influence on the performance of smallholder farmers as it influenced both output and increase in annual returns (Madafu, 2015).

Baiyegunhi and Fraser (2014) did a study in South Africa which looked at smallholder farmers' access to credit in the Eastern Cape region. The authors found that there was a statistically

significant relationship between gender and smallholder farmers access to credit. Results further showed that education level and income of the household head was significant in determining smallholder farmers' access to credit. The value of assets, savings and social capital such as belonging to farmer groups also had a statistically significant relationship with farmers' access to credit (Baiyegunhi and Fraser, 2014). Still in South Africa, Mayowa's (2015) study in Limpopo Province focused on factors that affected smallholder farmers access to agriculture credit using a prohibit regression model. Results indicated that the variables gender, education, farm income, pension, land size, cooperative, fixed assets and registered business had a significant positive influence on smallholder farmers' accessing agricultural credit from the Land Bank in the last three years. In addition, marital status, farming experience, off-farm income, loose assets, farm commodity and farm record had an insignificant positive influence. Results also showed that the age of the household head had a significant negative influence on smallholder farmers' accessing agricultural credit. In addition, household size, employment, distance to the nearest town and farmers' association membership had an insignificant negative influence on credit access (Mayowa, 2015).

In Nigeria, Adeyonu et al (2017) analysed the factors influencing access to credit. Results of the analysis showed that the factors that were found to be important in explaining access to credit included extension visits, distance to formal credit sources, hours of entrepreneurial training and commercial broiler production enterprise, years of education, household size and broiler parent stock enterprise were the important factors influencing the amount of credit received Adeyonu et al (2017). Further, another study by Anyiro and Oriaku (2011) in Nigeria showed that the age of the household head, education level, farm income, extension contact and distance between home and loan source were statistically significant in determining farmers' access to credit. In addition, farming experience and farm size were also significant. However, the coefficient of education, farming experience extension contact, household size and distance between home and size, and marital status were negative. The coefficient of membership of co-operatives and gender possessed a negative sign (Anyiro and Oriaku (2011). In another related study on Nigeria, Filli *et al* (2015) conducted a study in Nigeria which focused on analysing the factors that influenced credit access among small scale fish farmers. Results exhibited that interest rate, farm insurance, payments period, age and subsidy were the positive and significant coefficients, while those of collateral on loan, installment of payment and formalities were negative and significant. The results also indicated that the major problems hindering access to credit were amount acquired, formalities involved and lack of collateral (Filli *et al*, 2015). Ololade and Olagunju (2013) examined the determinants of credit access by rural farmers in

Nigeria. Their research results revealed that significant relationships existed between sex, marital status, lack of guarantor, high interest rate and access to credit. The authors also observed that there was a need for financial institutions to help investigate the conditions for obtaining credit by farmers, so that the less privilege among them will be able to benefit from credit disbursement especially in the aspect of high interest rate, guarantor and collateral security (Ololade and Olagunju, 2013).

Adams (2015) identified the determinants of microcredit access and farmers' investment in small scale peri-urban agriculture in Ghana. The author's results showed that gender of the household head, source of credit, awareness of credit services on offer and land ownership had significant influence on access to credit (Adams, 2015). Still in Ghana, Anang et al (2015) identified the factors that influenced smallholder farmers' access to agricultural microcredit. Results showed that gender of the household head, household size, farm capital, cattle ownership and improved technology adoption were the significant factors determining access to loans (Anang et al, 2015). Sekyi (2017) conducted a study around rural farm households' credit access and loan amounts in Ghana as well. His results indicated that gender of the household head, age, farming and trading occupations, credit history, and household income were significant determinants of rural households' credit access. Results also revealed that gender, education, marital status, trading, formal sector workers, distance and credit source are significant predictors of loan amount to be given to the farmer (Sekyi, 2017).

The Zambia National Farmers' Union (2009), assessed the Zambia agriculture finance market (supply and demand) and found that farmers felt that credit was scarce and costly and favoured the largercorporate sector. On the other hand, bankers and Microfinance Institutions indicated that in Zambia, agriculture lending in Zambia was risky business and very expensive.

Sebatta *et. al.* (2014) conducted a study on determinants of smallholder farmer's access to agricultural finance in Zambia. It was found that education level of the household head, size of the household as well as number of daily meals served significantly influenced the farmer's decision to access finance.

It could be noted that the above highlighted studies focused on highlighting the factors that influenced small scale farmer access to finance. However, they did not specifically analyse in a quantitative way, the relationship that existed between access to finance and the cost of credit which is very critical in determining the level of participation by farmers in agriculture finance

market. Therefore, this study will go a step further and analyse the quantitative relationship that exists between farmer's access to credit and its cost.

2.9 Conceptual Framework

In many developing countries, the ability of the poor to access credit tends to be restricted due to lack of collateral to secure loans. Collateral serves as a mitigating factor for both default risk and lender's exposure in the event of a default (P. Ghosh et al, Dec 1999). Stiglitz and Weiss (1981) articulates the adverse selection theory of credit markets which is mainly premise on two assumptions that firstly, lenders cannot distinguish between different types of risk borrowers. Secondly, the obligations of a borrower are limited liability; borrowers do not have "skin in the game". Therefore, providers of credit tend to restrict the credit by increasing the collateral required which in most cases the poor cannot provide.

Whilst the credit rationing theory restricts supply of credit, the lending with joint liability theory articulates a possible solution for making access to credit by the poor feasible. The theory is not without challenges either. Problems of adverse selection, moral hazard, costly verification and enforcement are present. However, the problems examined under joint liability theory can supposedly be mitigated by making a group of borrowers accountable rather than an individual. Further, the theory of consumer utility maximization focuses on the consumer of a product or service with the ultimate objective of maximizing utility from its consumption. In this case, the small-scale farmer chooses to access credit subject to a number of factors with the objective of maximizing its use in his/her activities on the farm.

Considering the above three theories and linking them to the empirical evidence to determine the existence of credit rationing and the practicality of joint liability, the paper examines the hinderances encountered by SHFs with respect to accessing financing while trying to maximize utility from the credit.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter begins with a description of the area where this study will be conducted. This is followed by an elaboration of the sampling and data collection techniques employed. Lastly but not the least, the analytical framework of the study and data analysis procedure is presented.

3.2 Study Area

Zambia is a Southern African, landlocked country which is located 15° south of the equator and 30° east of the Greenwich line. Though landlocked, Zambia is sometimes referred to as land linked because of the eight neighbouring countries surrounding Zambia which present an immediate export market for various types of commodities originating from Zambia. It has tropical climate and is suitable for various agricultural activities. This study used data collected from six districts across four provinces of Zambia. The districts involved in the study were Serenje in Central Province, Mpika in Muchinga Province, Choma and Sinazongwe in Southern Province, and Petauke and Nyimba in Eastern Province. The provincial representation of the study sample is shown in Table 2. About 18 percent of the respondents were from Muchinga Province, 11.5 percent came from Central Province, 22 percent came from Southern Province, while Eastern Province contributed around 48 percent.

Table 5: Sampling Distribution

Province	Number of respondents	Percentage (%)
Central	142	11.5
Muchinga	220	17.9
Eastern	597	48.5
Southern	272	22.1
Total	**1,231**	**100**

Source: (IAPRI/UNZA Climate Change and Land Use Survey (2013) Data).

3.3 Sampling and Data Collection

In this study, secondary data was used. The data was collected in 2013 under the University of Zambia/Indaba Agricultural Policy Research Institute (IAPRI) Climate Change Land Use project. The 1,231 households in the sample were selected from a nationally representative sample of the Rural Agricultural Livelihood Survey of 2012 (RALS 2012) conducted by the

Zambia Central Statistics Office (CSO) and Indaba Agricultural Policy Research Institute (IAPRI). The IAPRI and University of Zambia (UNZA) Climate Change supplemental survey of 2013. The supplemental survey used a structured questionnaire that was administered to the 1,231 household heads. The questionnaire took about 40 – 60 minutes to administer (Kuntashula *et al*., 2014).

3.4 Analytical Framework

3.4.1) The Logistic Regression Model

This study will use the multiple logistic regression model since the required analysis is based on a categorical dependent variable (i.e. either farmer accessed finance or not). Logistic regression is a form of regression, which relaxes the assumption of a metric nature of the dependent variable, and also provides a range of diagnostic and explanatory techniques for non-metric dependent variables (Hair Jr. *et al*., 1995). Generally, logistic regression is free of restrictions, and it has capacity to analyse all types of independent variables (continuous, discrete and dichotomous) (Tabachnick & Fidell, 2007). In addition, the variety and complexity of data sets that can be analysed are almost unlimited (Tabachnick & Fidell, 2007). Unlike multiple regression methods, there is no assumption about the distribution of the predictor variables (such as normality, linearity, or equal variances) (Tabachnick & Fidell, 2007). The outcome variable has to be discrete and if it were a continuous variable, then it would have to be converted to a discrete one (Tabachnick & Fidell, 2007).[18]

The probability of smallholder farmers accessing finance will be modelled as a function of certain characteristics of the small holder farmers. The decision by a farmer on whether to access finance or not is influenced by various factors such as collateral, age, education level of household head, the size of the household, size of farmland owned, the wealth level of the household, access to information, the land tenure systems, as well as distance between farm and nearest urban centre.

The model produced in logistic regression is nonlinear and the outcome variable, Y, is the probability of having one outcome or another based on a nonlinear function of the best linear combination of predictors, with two outcomes. Estimating the probability of finance access for a single binary choice variable (Y) using the logit model, a probability index is formed. The simple logistic regression model has the form (Agresti & Finlay, 2009; Peng & So, 2002):

[18] Discrete Variable is one that is only able to take up a finite number of values while a Continuous Variable has an infinite possible values.

$$\text{In}\left(\frac{\pi}{1-\pi}\right) = \log(\text{odds}) = \text{logit} = \alpha + \beta x$$

This formula uses the log of the odds, called the logistic transformation, or logit for short. Logistic regression equations can also be directly expressed in the form of the probability of success. When we take the antilog on both sides, we derive the equation to predict the probability of the occurrence of the outcome of interest as (Peng & So, 2002):

$$\pi = \text{Probability (Y)} = \frac{e^{\alpha+\beta x}}{1+e^{\alpha+\beta x}}$$

Where π is the probability of the outcome of interest (y=1); α is the Y intercept (constant of the equation); βs are the regression coefficients of the explanatory variables (vector of coefficients to be estimated); Xs are a set of predictors and e is the base of the system of the natural logarithms (Peng & So, 2002). Data are entered into the analysis as 0 or 1 coding for the dichotomous outcome which in this case is access to finance by small scale farmers. Further, continuous values for continuous predictors, and dummy coding for categorical predictors.

The aforementioned factors that influence access to finance will be used as independent variables for the Logistic regression model. The Logistic regression model will have a binary dependent variable: it will take the value of 1 in the event that the farmer accesses finance and 0 otherwise.

Extending the simple logistic regression to multiple predictors creates a complex logistic regression for Y (the logistic regression function which is the log transformation) as follows (Agresti & Finlay, 2009; Peng & So, 2002):

$$logit\ (Y) = In\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots\ldots\ldots + \beta_n X_n$$

Where;

Y: is the outcome of interest (access to finance) and is either equal to 1 when farmer has accessed finance or equal to 0 otherwise.

π: probability of farmer accessing finance,

β: coefficient of the various factors affecting access to finance,

X: vector of various factors affecting access to finance which can be dichotomous or continuous.

The procedure for estimating coefficients is the maximum likelihood, and the goal is to find the best linear combination of predictors to maximise the likelihood of obtaining the observed outcome frequencies (Tabachnick & Fidell, 2007).

Depicted below is a dummy table for the variables that affect access to finance.

Table 6: Dummy variables for affecting access to finance

Variables	Definition	Measurement	Expected sign
Dependent			
Access to finance	Household accessing finance	1=Yes, 0=otherwise	
Independent			
Sex	Gender of head of household	1=Male, 0=Female	+
Household size	Number of people in a household	Number	+/-
Age	Age of household head	Number of years	+/-
Education	Highest level of education of household head	Number of schooling years	+/-
Distance	Distance between farm and urban center	kilometers	+/-
District	District household is located	Name of district	+/-
Finance cost	Interest rate	Percentage	+/-
Farm size	Size of farming land	hectares	+/-
Proximity to the market	Average distance to the nearest market	kilometers	+/-
Access to information	Access to subsidized fertilizer	1=Yes, 0=otherwise	+
Land tenancy	Form of land tenancy	1=Own, 0=otherwise	+

3.5 Data Analysis

Descriptive statistics will be used to characterize the socio-demographic characteristics of smallholder farmers. Excel will be used to characterize the socio-economic as well as farm aspects of smallholder farmers. Thereafter, the data will be exported into STATA and analysed to determine the factors affecting access to finance as well as determine the percentage of smallholder farmers accessing finance.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter starts with a description of the various socio-economic characteristics of the smallholder farm households involved in the study. This is followed by results and discussions on the empirical analysis on the factors that affect smallholder farmers' access to finance. Among the factors analysed include farm size, education level of the household head.

4.2 Demographic Characteristics

Table 7 below shows the demographic characteristics of the household heads by district. The average age of the household head for the total sample was 46.3 years. The oldest average age was recorded in Choma at 48.9 years while the youngest age was 43.6 years in Sinazongwe. In addition, only 19.6% of households were headed by females which is a general reflection of households in most of the rural parts in Zambia. Across the districts, the highest proportion of female headed households was observed in Sinazongwe (20.8%) while the lowest was in Choma (16.5%). This is further supported by research which was conducted by IAPRI (2015) who found that the majority (74%) SHF households are headed by men while the rest headed by women.

Further analysis of the data showed that the majority (73.8%) of household heads were monogamously married while 7.5% were in polygamous marriages. 17.6% of the household heads were either widowed, divorced or separated and only 1.1% were not married. Furthermore, the majority of household heads interviewed were above 50 years of age (figure 4 below). This was mainly due to the reason that in rural Zambia, older household heads' generally engage in agricultural activities while the younger age groups tend to focus more on off-farm income generating activities. Similar patterns of age group distribution were observed in all the districts were the study was conducted. IAPRI (2015) found that the largest age group among farmers they interviewed was 65 at 15.3% more than the other age groups.

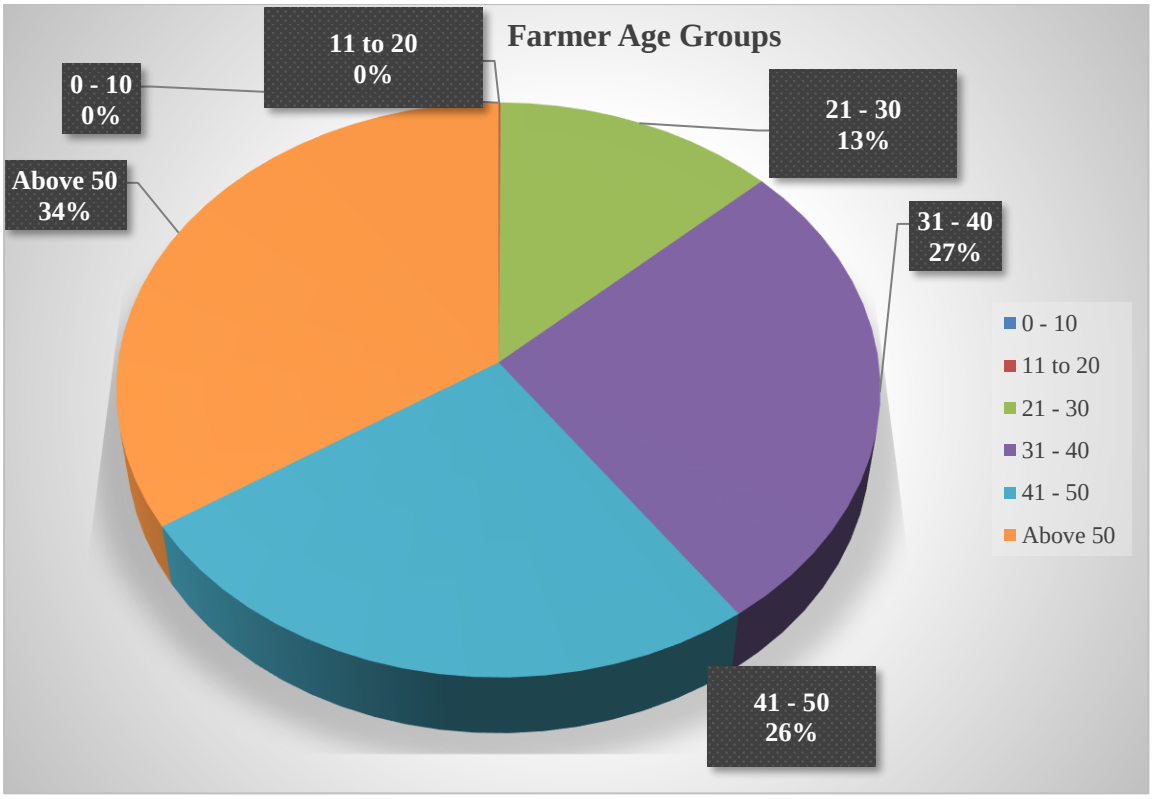

Figure 4: : Smallholder Farmers by Age group

More than half (57.4%) of household heads had managed to complete primary school education while 26.6% had completed secondary education. Only 2.5% of the interviewed household heads had completed tertiary education and 13.6% had never been to school. This is generally the prevailing situation with regards to education in rural areas and is mainly due to lack of proper and adequate tertiary education infrastructure.

Table 7: Household Demographic Characteristics

Characteristics	Total	District					
		Choma	Sinazongwe	Serenje	Mpika	Nyimba	Petauke
Number of Households	1,231	152	120	142	220	285	312
Household head characteristics							
Mean age	46.3	48.9	43.6	46.3	47.3	45.1	46.4
Female headed households (%)	19.6	16.5	20.8	19	28.8	21.4	17.6
Household size	6.1	6.8	6	6.7	6.1	6.2	6.5
Marital status (%):							
Single	1.1	2.6	2.5	0	0	1.8	0.3
Married	73.8	64.5	59.2	80.3	75.9	76.5	77.2
Polygamously married	7.5	20.4	20.4	2.1	2.3	2.1	7.1
Widowed/ divorced/ separated	17.6	12.5	17.5	17.6	21.8	19.6	15.4
Age groups:							
10 years and below							
11 to 20 years	1	0	0	0	1	0	0
21 - 30 years	161	10	23	23	20	43	42
31 - 40 years	332	38	29	39	68	73	85
41 - 50 years	316	40	34	29	54	77	82
Above 50 years	421	64	34	51	77	92	103
Education (%):							
No education	13.6	2.6	10.8	5.6	4.6	15.4	28.2
Primary (1-7 years)	57.4	64.5	56.7	57	55	55.4	57.7
Secondary school (8-12 years	26.6	27.6	27.5	36	37.3	28.8	11.9
Tertiary education (> 13 years)	2.5	5.3	5	1.4	3.2	0.4	2.2

Source: (IAPRI/UNZA Climate Change and Land Use Survey (2013) Data).

In pursuit of achieving the first objective of this study, analysis of the data was done with access and/or non-access to finance being the separating factor. Results from table 8. below showed that only 14.1% of smallholder farmers had accessed finance. This result is similar to studies done by Sebatta *et al* (2014) and CABRI (2014) who found that only 11% and 13% of smallholder farmers in Zambia had access to finance ,respectively. Of the total number of smallholder farmers who accessed finance, 87% were male headed while the remainder were female. This could be attributed to the reason that most agriculture and finance decisions in rural areas are usually determined by males than females, a narrative which needs to change if inclusive and sustainable development is to be achieved in the agriculture sector.

Table 8: Social Economic and Farm Factors

	Total Sample		Access to Finance			
			Accessors		Non-accessors	
Variable name	**Mean**	**Std Deviation**	**Mean**	**Std Deviation**	**Mean**	**Std Deviation**
Dependent variable						
Finance access (=1 if yes)	0.141	0.349	1	0	0	0
Independent Variables						
Household factors						
Gender (male=1 or 0 o/w)	0.804	0.397	0.868	0.34	0.794	0.405
Age of household head in years	46.3	14.942	45.8	12.8	46.4	15.3
Log of Age	3.8	0.309	3.81	0.27	3.81	0.32
Primary education of head	0.574	0.495	0.557	0.498	0.557	0.498
Secondary education of head	0.265	0.442	0.207	0.406	0.275	0.446
Tertiary education of head	0.025	0.157	0.029	0.168	0.025	0.155
Houshold size	6.1	2.42	5.8	2.286	6.1	2.44
Assets						
Own a radio (=1 if yes)	0.6	0.49	0.44	0.48	0.593	0.491
Own a TV (=1 if yes)	1.804	0.397	1.799	0.402	1.805	0.396
Own Mobile phone, (=1 if yes)	1.426	0.495	1.454	0.499	1.422	0.494
Own ripper, (=1 if yes)	0.021	0.144	0.052	0.222	0.016	0.126
Own tractor (=1 if yes)	1.998	0.04	1.994	0.076	1.999	0.031
Own truck (=1 if yes)	1.997	0.057	2	0	1.996	0.061
Own Van (=1 if yes)	1.977	0.149	1.989	0.107	1.975	0.155
Own motorcycle (=1 if yes)	1.966	0.182	1.931	0.254	1.972	0.166
Own cattle (=1 if yes)	0.354	0.478	0.598	0.492	0.314	0.464
Farm level factors						
Farm size	2.969	3.608	3.759	2.796	2.838	3.709
Hectares planted	1.672	1.714	1.826	1.456	1.646	1.753

Hired labour (=1 if yes)	0.174	0.379	0.138	0.346	0.1	0.384
Animal labour use (=1 if yes)	0.35	0.477	0.477	0.501	0.329	0.411
Social factors						
Information access (=1 if yes)	0.887	0.317	0.96	0.197	0.875	0.331
Group membership (=1 if yes)	0.452	0.498	0.483	0.501	0.447	0.497
Independent Variables						
Outgrower scheme member (=1 if yes)	1.898	0.302	1.282	0.451	2	0
Geographical factors						
Distance to nearest town (Kms)	31.8	27.362	28.73	16.76	32.34	28.75
Choma (=1 if farmer located in district)	0.123	0.329	0.575	0.233	0.134	0.341
Sinazongwe (=1 if farmer located in district)	0.097	0.297	0.08	0.273	0.1	0.301
Serenje (=1 if farmer located in district)	0.115	0.32	0.115	0.107	0.132	0.339
Mpika (=1 if farmer located in district)	0.179	0.383	0	0	0.208	0.406
Nyimba (=1 if farmer located in district)	0.232	0.422	0.252	0.436	0.228	0.42
Sample size	1,231		174		1057	

Source: (IAPRI/UNZA Climate Change and Land Use Survey (2013) Data).

The average age of the household head was 46.3 years while for farmers that accessed finance and those that did not was 45.8 and 46.4 years respectively. Further, it was observed that across all groups of farmers, the highest number of both farmers that accessed finance and those that did not was in the age group of household heads above 40 years.

In addition, a larger number of smallholder farmers that had been to school did not access finance as opposed to their less educated counterparts. This could be due to the reason that the educated ones were earning some form of off-farm income and thus did not have any need to get credit.

Furthermore, results showed that the number of people in each household ranged from 1 to 18 members. The average household size for farmers that accessed finance and those who did not was 5.8 and 6.1 respectively.

It was also observed that, overall, 88.7% of the farmers had access to information with regards to agriculture finance. Among the farmers that had accessed finance, 96% had prior information on agriculture finance while 87.5% of farmers not accessing finance had such information.

For household asset ownership, only 2.3% and 0.3% of farmers owned vans and trucks respectively. Further, 0.2% and 3.4% of the farmers owned tractors and motorcycles respectively. In addition, among the farmers that accessed finance, 1.2%, 0, 0.6% and 7% owned vans, trucks, tractors and motorcycles respectively. Similar low ownership of assets was also observed among the farmers that did not access finance. Assets are important if one has to access finance especially from banks and other finance lending institutions. In addition, across the total sample, 35.4% of smallholder farmers owned cattle while 60% and 31% of the finance accessors and non-accessors owned cattle respectively. Thus, the low non-livestock asset ownership among the farmers, could have contributed to the low level of access to finance among the farmers. However, the situation is expected to change, as more banks and MFIs have started to accept livestock owned by farmers as collateral for finance borrowing.

In addition, results showed that more male headed households (47%) belonged to one or more farmers or agricultural related groups as compared to female headed households (36%). It was observed that 48.3% and 44.8% of the finance accessors and non-accessors respectively belonged to an agricultural group. Membership to farming or agricultural groups is critical to the for farmers to obtain information on agricultural finance from their fellow farmers.

It was also observed that the overall average household farm size was 2.97 hectares while it was 3.8 hectares and 2.8 hectares for the farmers that had accessed finance and those that did not respectively. This was expected, as households with more land at their disposal are more likely to use it as collateral in the event of them trying to access finance.

Distance between the farm location and nearest town is also key in determining the ease of farmers accessing finance. This mainly because the longer the distance, the higher the transaction costs to be faced by both the lender and borrower and hence the lower the chances of the farmer accessing finance and vice versa. The average distance from the farmers' location to the nearest town was 31.8 kms for the total sample. On the other hand, the aforesaid distance

was 28.7 kms and 32.3 kms finance accessors and non-accessors respectively. Closely related to distance between farmers' location and town is the actual location of the town with respect to the line of rail. Towns located near the line of rail generally have more banks and MFIs as opposed to the ones off it. This is mainly since independence as development efforts by government have focused more along the line of rail mainly due to ease of access. However, this was not the case in this study, as it was found that towns like Petauke (33.3%), Nyimba (15.4%) and Sinazongwe (11.7%) which are off the line of rail had more farmers accessing credit as opposed to the towns that were located along the line of rail like Choma (6.6%), and Serenje (1.4%).

Further analysis of the data and by calculating the wealth index of the smallholder farmers that were interviewed, 38% of them were wealthy while the rest were not. More than half (55.2%) of the farmers that accessed finance were wealthy while only 35% were wealthy among the farmers that did not access finance. The level of wealth, which is a combination of assets owned and income earned by a household can determine the ease with which a household can access finance. Lenders would usually give finance to wealthy households as they view them as carrying less risk when it comes to paying back the finance.

Among all the farmers that were interviewed, 17.4% had hired labour for farming purposes. Further, 13.8% of farmers that accessed finance had hired labour and on the other hand, 18% of farmers that never accessed finance had hired people to perform various tasks on their farms. The next section, discusses the results from the logistical regression model which was used to determine the factors that affected smallholder farmers' access to finance.

4.3 Factors Affecting Smallholder Farmers' Access to Finance in Zambia

There are various factors that were hypothesized to affect smallholder farmers' access to finance. This was done to assess the second objective of this study which was to determine the factors that affect smallholder farmers' access to finance in Zambia. In order to achieve this, a logistic regression model was used with access to finance being dependent variable and factors like age, household size being among the independent variables. Model diagnostics were performed to check for possible model specification errors. The Wald Chi square statistic equaled 89.9 (Prob > Chi2) = 0.000). This indicated that the hypothesis that all coefficients were equal to zero could be rejected at 1% significance level and thus the model fitted well. The variable collateral ownership was significant at 1% level of significance in the model.

Owning of collateral by a smallholder farmer, increased the odds of accessing finance by 2.1, holding all other factors constant. Chandio *et al* (2017) and Korir (2013) in their respective

studies also found that access to collateral increased the chances of a household accessing finance in Pakistan and Kenya, respectively. Further, results indicated that a household head who has attended secondary school, had higher odds (0.443) of accessing finance compared to their counterparts who have never attended secondary school. This is corresponds with Chandio et al (2017) study in Pakistani who found that education level was important in determining farmers access to finance. Surprisingly, attending tertiary education had no significant effect on the odds of a farmer accessing finance (Table 3). This could be attributed to the reason that a farmer who has attended secondary school has sufficient knowledge needed to access finance and manage it properly. Further, farmers who have attended tertiary education are more likely to have other sources of income (e.g formal salary) and hence are less likely to go to a bank or MFI to get finance for agricultural activities on his/her farm.

Furthermore, holding other factors constant, household heads' who had access to finance information increased their odds of accessing finance by 2.7. This could mainly be because farmers mostly make decisions on whether to access finance or not based on available information. Thus, if a farmer has information with regards to where they can access finance, chances of accessing the finance are increased. In addition, being a member of a farmer group is also important in determining farmers access to finance. This was evidenced by a study done by Kiplimo et al (2015) who conducted an evaluation of the factors that affected smallholder farmers' access to financial services in the Eastern part of Kenya. However, upon analysing the data, it was revealed that farmer group membership was not significant at all confidence levels. In addition, analysis of the data showed that size of the farm was significant in determining access to finance. For instance, increasing the size of the farm by 1 hectare increased the odds of a farmer to access finance by 2. This could be attributed to the reason that land is important for production purposes and thus borrowers look at it as security against the borrowed funds. In addition, larger land sizes can sometimes be a proxy for high production levels and thus lenders could be more comfortable to give credit to farmers with larger pieces of land as opposed to those with smaller land sizes. This was supported by studies done by Chandio et al (2017) as well as Lemessa and Gemchu (2016) who found that the size of the farm had a positive effect on farmers ability to access finance. Further analysis of the data revealed that farmers closer to towns were more likely to access finance than those that were located further from town centres were most banks and MFIs have branches. For example, an increase in distance of 1 km between the nearest town and the location of the farmer reduced the odds of that farmer accessing finance by 1.013. Results found by Lemessa and Gemechu (2016) are in line with the aforesaid results. Other important factors such as size of the household, level of wealth which

are important factors were also analysed but they were not significant in determining farmers' access to finance. Furthermore, during analysis, spatial differences in the data were controlled for by the generation of dummy variables for the respective districts from which the households were sampled. Choma and Serenje districts were significant at 1% confidence level in determining access to finance. A household being located in Serenje than Mpika increased the odds of the farmer accessing finance by 0.1. In addition, being located in Choma than Mpika increased the odds of a farmer accessing finance by 0.22. These results could be explained by the fact that Serenje is located in the farming belt of Zambia where a lot of banks and MFIs have set up branches and thus farmers could easily access credit. On the other hand, Choma is located in the Southern part of Zambia where farmers own large herds of cattle which could easily be used as collateral in the event that a farmer decides to go to the bank to access finance. Further, being in Nyimba than Mpika increased the odds of farmers accessing finance by 0.72. This could be attributed to the reason that Nyimba is located in the eastern part of Zambia where generally, a large number of agricultural credit programmes have been piloted in the past and thus this has increased chances of farmers located there to access finance.

Table 9: Factors affecting access to finance

Dependent Variable - Access to finance	**Odds Ratio**	**P-Value**
Independent Variables		
Farmer and household characteristics		
Gender	1.289	0.35
	(-0.351)	
Age	0.806	0.476
	(-0.244)	
Out-grower scheme membership		
Primary education	0.581**	0.019
	(-0.135)	
Secondary education	0.443***	0.004
	(0.127)	
Tertiary education	0.689	0.522
	(0.401)	
Household size	0.851	0.503
	(-0.205)	
Farm size	1.937***	0
	(0.327)	
Information access and institutional factors		

Dependent Variable -		
Access to finance	**Odds Ratio**	**P-Value**
Independent Variables		
Access to finance information	2.693**	0.018
	(1.129)	
Agricultural group membership	0.807	0.074
	(0.158)	
Collateral	2.053***	0.001
	(0.436)	
Wealth	1.098	0.7
	(-0.266)	
Geographical factors		
Distance to nearest town	1.013***	0.054
	(-0.003)	
Choma	0.218***	0
	(-0.0807)	
Sinazongwe	0.536**	0.048
	(0.169)	
Serenje	0.0860***	0.001
	(-0.0633)	
Nyimba	0.716**	0.128
	(0.157)	
Constant	0.121	0.134
	(-0.171)	
Observations	1,231	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: (IAPRI/UNZA Climate Change and Land Use Survey (2013) Data).

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter threads together the findings and concludes on how the key objectives of the study were addressed. Policy recommendations are purported based on the key findings, as these may help inform key policymakers on various solutions to tackle credit constraint to small holder farmers. The chapter closes by proposing areas where future research related to this study could be undertaken.

5.2 Conclusions

Agriculture finance is cardinal conduit through which increased agricultural production rests. Without agriculture finance, it becomes increasingly difficult for farmers to purchase inputs as well as other important implements which are critical for agricultural production (Sebatta *et al*, 2014). The first objective of this study was to find out the proportion of smallholder farmers that had access to finance in Zambia. The other objective was to identify the factors that had an effect on smallholder farmers' access to finance in Zambia.

To achieve the above-stated objectives, this study used data obtained by the Indaba Agricultural Policy Research Institute (IAPRI)/University of Zambia (UNZA) Climate Change and Land Use Project that implemented a supplemental climate change survey in 2013 on Rural Agricultural Livelihood Survey panel sample of households. The study used the logistic regression model to identify the factors affecting access to finance among smallholder farmers and also to determine the proportion of smallholder farmers that had access to finance.

With regards to the level of finance access, only 14.1% of the interviewed smallholder farmers had access to finance. Among the farmers that had accessed finance, only 13% were female and this showed a biased towards male farmers when it comes access to finance in most rural parts of the country.

Analysis of the factors affecting smallholder farmers access to finance in Zambia yielded various results. For instance, Secondary education, access to finance information, size of the farm, access to collateral as well as distance between the nearest town and the location of the farmer were significant in determining access to credit. Furthermore, farmers located in Choma,

Sinazongwe, Serenje and Nyimba districts were more likely to access finance. However, factors such as household size, tertiary education, and the level of wealth were not significant when it comes to determining access to finance among smallholder farmers.

Results also showed that the average army of the smallholder farmers interviewed was 46.3 years and the majority were above 40 years of age. This showed that less youths engaged in agricultural activities in most of the rural parts of the country. Many would instead emigrate to urban areas in search of jobs. Results also showed that only 19.6% of the households interviewed were female. 17.4% of farmers had hired labour for farming purposes. Further, 13.8% of farmers that accessed finance had hired labour and on the other hand, 18% of farmers that never accessed finance had hired people to perform various tasks on their farms.

The results show that there is strong credit constraint to agriculture farmers in Zambia. The age group of farmers is skewed to range between 40-60 years. An inference that can be drawn is that if there would be more agriculture finance availed to younger age group, agriculture production can not only be boosted but this will ensure succession farming for future generations in Zambia.

5.3 Recommendations

The government of the Republic of Zambia, Banks, Non-Governmental Organisations and Micro Finance Institutions are key facilitators to growing SME agricultural credit and therefore consideration towards increasing their efforts of spreading information on the importance of agriculture finance should be executed. Further, the government needs to create a solid and stable environment which encourages investment into agriculture financing by banks and MFIs especially in rural areas. Government should formulate policies which can induce confidence to agriculture stakeholders in the market to actively participate in trading through ZAMACE and encourage equity participation in the exchange by banks.

Collateral needed by smallholder farmers must be reduced to a lower and attainable standard; there should be harmonization in facilitated loans to farmers by lenders. This way it ensures that finance is availed to farmers with little or no collateral at an affordable price. Traditional banking system is the dominant form financial intermediation in Zambia, and government

needs to work closely with banks to guarantee small holder farmers debt, that way credit risk borne by banks can be reduced and mitigated. Furthermore, the advocacy for Landholding Certificates such as ParcelCerts issued in Chibombo should be taken on board by MoA for presentation to parliament to be passed as a legal document of title as a Title Deed serves as proof of ownership in order for smallholder farmers to be able to provide collateral to source credit.

There is also need to revisit the structure of the farmers' cooperatives particularly in rural areas in order to improve information dissemination, improve education levels and address other factors which emanate from location of farmers. In addition, there is need for banks and MFIs to raise awareness among farmers on the various financial products on offer and ensure that more farmers are enrolled into government programs such as the Zambia Credit Guarantee Scheme (ZCGS). Sensitization of various credit facilities is vital if there is to be greater access of capital by the small holder farmers. Financial Inclusion programs and financial literacy building still remains very low in Zambia, it is therefore imperative to continue encouraging the private sector to build financial awareness in this sector as education is one of the critical factors which impact access to finance it also alleviates moral hazard.

This initiative has the propensity to significantly increase the number of farmers that can access finance in rural areas and broaden financial deepening and inclusion. Through increased credit rationing Zambia can expect increased agriculture production, increased food and income security among farmers as well as enhanced sustainable agriculture development. Furthermore, increased incomes among smallholder farmers places them in an advantageous position where they can purchase their own inputs for production and depend less on government input subsidy programs and ultimately substantially reduce poverty levels. The reduced reliance of government by rural small holder farmers frees up government resources for investment in other sectors of the economy such as infrastructure and foster sustainable development.

5.4 Future Research

Considering the fact that access to finance among smallholder farmers has been generally low for a long time in the country, there is need to draw attention to banks and find out specifically what hinders finance product development to cover smallholder farmers especially in rural areas.

Future research can attempt to elucidate on gender bias towards men in agriculture sector and

assess which factors lead to this asymmetry and further assess if finance to females can boost sustainable development and help galvanize poverty levels.

Sample size for future research should be extended to more parts of Zambia, to gauge if factors that restrict access to credit are uniform in each province.

Further, there is need to conduct a time series analysis using Central Bank interest rate figures and the number of smallholder farmers that have accessed finance over a 20-year period so as to determine the relationship between interest rate (external factor) and smallholder farmers' access to finance.

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