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COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

DETERMINANTS OF ACCESS TO FORMAL CREDIT FOR SMALL LAND HOLDER FARMERS: A CASE IN BAHIR DAR ZURIA WOREDA

By:

Abreu Yirdaw Bezabih

January, 2021

Bahir Dar, Ethiopia

BAHIR DAR UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

DETERMINANTS OF ACCESS TO FORMAL CREDIT FOR SMALL LAND HOLDER FARMERS: A CASE IN BAHIR DAR ZURIA DISTRICT

By:

Abreu Yirdaw Bezabih

A Thesis Submitted in Partial Fulfillment of the Requirement for the Degree of Master of science in Accounting and Finance

Advisor: Honeligne Eshetie (PhD)

January, 2021

BAHIR DAR, ETHIOPIA

DECLARATION

This is to certify that the thesis entitled "***Determinants of Access to Formal Credit for Small Land Holder Farmers: A Case in Bahir Dar Zuria Woreda"*** submitted in partial fulfillment of the requirements for the degree of Masters of Science in Accounting and Finance of Department of Accounting and Finance, Bahir Dar University is a record of original work carried out by me in line with the regulations of the university and meets an accepted standards with respect to originality and quality.

Aberu Yirdaw Bezabih	03/01/2021	Bahir Dar
Name of the candidate	Date	Place

BAHIR DAR UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

Approval of Thesis for Defense

I hereby certify that I have supervised, read, and evaluated this thesis entitled "***Determinants of Access to Formal Credit for Small Land Holder Farmers: A Case in Bahir Dar Zuria Woreda***" by **Aberu Yirdaw Bezabih** prepared under my guidance. I recommend the thesis be submitted for oral defense.

_____	_____	_____
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COLLEGE OF BUSINESS AND ECONOMICS

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Approval of Thesis for Defense Result

As members of the the board of examiners, we examined this thesis entitled "***Determinants of Access to Formal Credit for Small Land Holder Farmers: A Case in Bahir Dar Zuria Woreda"*** by Aberu Yirdaw Bezabih. We hereby certify that the thesis is accepted for fulfilling the requirements for the award of the degree of Master of Science in Accounting and Finance.

Approved by:

External examiner name	Signature	Date
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Internal examiner name	Signature	Date
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Chair person's name	Signature	Date
_____	_____	_____

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ABSTRACT

This study tried to identify the effect of demographic, socio-economic and institutional factors on access to formal credit in Bahir Dar Zuria Woreda. To achieve this objective, the study utilized cross-sectional survey research design. Primary data was collected using self-designed questionnaire from 360 Bahir Dar Zuria woreda household farmers who were selected by multi-stage sampling. Binary logistic regression model was used to analyze the mixed data using SPSS version 23. In addition, interview was conducted with selected ACSI officers to support the data collected by questionnaire. The result of the study revealed that 48 % of the respondents in the study area have access to formal credit while 53 % of the respondents did not have the access to formal credit. It also found that variables like collateral requirement, saving culture of households, source of information, number of livestock unit, experience in credit use and deposit interest rate were important in influencing access to formal credit use as evidenced by the model output. Hence, the researcher suggests that CBE and micro finance institutions should encourage farmers saving culture by strengthening deposit interest rate. MFIs should promote themselves and the type of services they will provide over different local media and mass media such as radio, television and newspapers so, the rural poor will have an improved farmer's accessibility of evidence. In case of collateral, the researcher recommended that the household heads or the respondents form a group to collect loan or credit from banks and microfinances. In case of source of information it is advisable that Small landholder farmers need to find new information about not only financial institutions but also everything related to their country.

Key words: Access to Formal Credit, Small Landholders, peasant association, logit regression

TABLE OF CONTENTS

CONTENTS Page

DECLARATION ..... **III**

Approval of Thesis for Defense ..... **IV**

Acknowledgment ..... **VI**

ABSTRACT ..... **VII**

LIST OF TABLES ..... **XI**

LIST OF FIGURES ..... **XII**

ABBREVIATIONS AND ACRONYMS ..... **XIII**

CHAPTER ONE: INTRODUCTION **1**

1.1. Background of the Study 1

1.2. Statement of the Problem 3

1.3. Objectives of the Study 6

1.4. Research Hypothesis 6

1.5. Significance of the Study 7

1.6. Scope of the Study 7

1.7. Organization of the Paper 8

CHAPTER TWO: LITERATURE REVIEW **9**

2.1. An Overview of Access to Formal Credit 9

2.1.1. The concept of small landholder farmers 9

2.1.2. Theory of access credit 10

2.1.3. Basic principles of credit 11

2.1.4. Credit in rural development 11

2.1.5. Types of rural credit 12

2.1.6. Rural finance reform in ethiopia 17

2.2. An Empirical Review on Determinants of Access to Credit 18
2.2.1. Empirical reviews outside Africa 18
2.2.2. Empirical reviews in other African countries 19
2.3. Summary and Knowledge Gap 22
2.4. Conceptual Framework 23
CHAPTER THREE: RESEARCH METHODOLOGY 24
3.1. Description of the study area 24
3.2. Research approach 25
3.3. Research design 26
3.4. Population of the Study 27
3.5. Sample size 27
3.6. Sampling Technique and procedure 28
3.7. Method of data collection and its sources 28
3.8. Method of Data Analysis 28
3.8.1. Tests of Validity and Reliability 29
3.8.1.1. Validity test 29
3.8.1.2. Reliability test 29
3.9. Assumption of binary logistic regression model 30
3.10. Model Specification 31
Variables Description and Measurement of Variables 33
3.10.1. Dependent variables description 33
3.10.2. Independent variables 33
CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS 38
4.1. Descriptive Statistics 38
4.1.1. Response rate: 38

3.1.2. Demographic characteristics 39

4.1.3. Socio- economic characteristics 41

4.1.4. Institutional characteristics 45

4.1.5. Cross- tabulation between the predictor variables and response variable 47

4.2. Binary logistic regression 53

4.2.1. Model assumptions and data properties 53

4.3. Binary Logistic Regression Result 58

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION 66

5.1. Conclusion 66

5.2. Recommendation 67

5.3. Suggestions for Further Research 68

REFERENCE 69

Appendix 75

LIST OF TABLES

Table 3. 1: Target population of the study 27

Table 3. 2: Dependent and independent variables of the study 36

Table 4. 2: Age of respondents and access to formal credit 47

Table 4. 3: Sex of respondents and access to formal credit 47

Table 4. 4: Education level of households and access to formal credit 48

Table 4. 5: collateral and access to formal credit 48

Table 4. 6: Chi-square test ..... Error! Bookmark not defined.

Table 4. 7: Farm size and access formal to credit 49

Table 4. 8: Saving culture and access to formal credit 49

Table 4. 9: chi-square test of saving and access to credit 49

Table 4. 10: Information and access to formal credit 50

Table 4. 11: TLU and access to formal credit 50

Table 4. 12: Experience in credit use 51

Table 4. 13: Distance and access to formal credit 51

Table 4. 14: Infrastructure and access to formal credit 52

Table 4. 15: Lending procedure and access to forma credit 52

Table 4. 16: Interest rate and access to formal credit 53

Table 4. 17: Chi-square test of interest rate and access to credit 53

Table 4. 18: Case-processing summary 54

Table 4. 19: Omnibus tests of model coefficient 55

Table 4. 20: Hosmer and Lemeshow Test 55

Table 4. 21: Model summary 56

Table 4. 22: Classification table 56

Table 4. 23: Contingency coefficients for explanatory variables 57

Table 4. 24: Variables in the equation table 58

LIST OF FIGURES

Figure 2: Conceptual framework for the study 23

Figure 1: Map of the study area 25

Figure 4: Sex of respondent 40

Figure 5: Education level of households 40

ABBREVIATIONS AND ACRONYMS

ACSI	Amhara Credit and Saving Institution
AIDB	Agricultural and Industrial Development Bank
ANRS	Amhara National and Regional State
BoA	Bureau of Agriculture
DAG	Development Assistance Group
DBE	Development Bank of Ethiopia
FMSC	Farmers Multi-Purpose Service Cooperatives
GDP	Gross Domestic Product
MFI	Micro Finance Institution
NBE	National Bank of Ethiopia
NGO	Non-Governmental Organization
NAROD	Norwegian Agency for Development Cooperation
BDZOA	Bahir Dar Zaria Woreda Office of Agriculture
ORDA	Organization for Rehabilitation and Development in Amhara
PA	Peasant Association
RSCA	Rotating, Saving and Credit Association
UNDP	United Nation Development Program
UNFP	United Nation Population Fund

CHAPTER ONE: INTRODUCTION

Formal credit is one source of finance for farmers to finance their factors of production. Small land-holders may not be able to have the access to formal credit due to their inability to fulfill the requirements requested by lending institutions. This study tries to identify the factors that affect access to formal credit for small landholder farmers in Bahir Dar Zuria Woreda.

This chapter consists of the background of the study, statement of problem, objectives, significance and scope of the study.

1.1. Background of the Study

Access to credit is very critical for small landholder farmer's growth in unindustrialized countries of the world. This is as a result of total production of farmers and enhancement in agricultural production per unit input (Chandio et al., 2017). According to online dictionary (n.d), credit leads to an increase in spending, thus increasing income levels in the economy. This, in turn, leads to higher GDP (gross domestic product) and thereby faster productivity growth. If credit is uses to purchase productive resources, it helps in economic growth and adds to income. Credit further leads to the creation of debt cycles. Additionally, credit is needed for farming purposes and as a bridging finance for family and consumption expenses especially between the planting and harvest periods. Thus, lack of access to formal credit by farmers negatively affects productivity (Chisasa, 2019).

In Ethiopia agricultural sector contributed over 85 % of export earnings, 44 percent of total Gross Domestic Product (GDP) and provides a livelihood to almost 73 percent of the population (DAG annual report, 2019). In addition, agricultural sector supports about 85% of the population that is completely dependent on agricultural related livelihoods, most of whom are poor people in the rural countryside. Therefore, agriculture is the fundamental stay of the economy (Kiros , 2012).

Even though farmers produce the majority of national agricultural production, agriculture is not capable to feed the fast growing population and diminish the dependence of food aid. And it is characterized by small-scale subsistence farmers with average land holding of 2.0 hectare per farm household, until now by using backward farming system which ultimately results in

low productivity (Muse Yuna, 2016). The low level of productivity and lack of ability of agricultural output to improve the livelihoods of the rural poor is as a result of several factors. These includes: limited access to formal credit, poor infrastructure, small land holdings (Ogato et al., 2010) and the nature of land tenure systems (Devereux, 2000).

Provision of access to formal credit is one of the major instruments used to reduce poverty and encourage rural entrepreneurship. Increasing accesses to formal credit holds the promise in reducing poverty and improve development outcomes by enabling the poor to smooth consumption and by increasing or diversify household income. Microcredit is established to benefit poor households who have not collateral and various requirements necessary to gain access to formal credit (Bauchet et al., 2011). Access to formal credit can significantly increase the ability of households to meet their financial needs like acquisition and use of better agricultural implements which are not accessible on the farm. Additionally, access to formal credit encourages household's ability to adopt modern agricultural technologies that increase the revenue of small landholder farmers and discontinuity of the the vicious poverty cycle.

Lack of access to formal credit has constrained small landholder farmer's skill to expand their production and improve their living standard, adoption of modern technology, nutrition and to get health (Bauchet, 2011). This condition attracted the attention of the Ethiopian government to establishing and popularized formal institutions, such as microfinance which have targeted on the delivery of credit to rural poor.

The rural financial systems in Ethiopia are dichotomous in nature. As a result, formal and informal sector co-exists, with the differences in their availability. Formal financial institutions are organizations, which is owned, controlled, licensed and registered by Governments. Informal credit institutions work without physical guarantee, involving small loans and short-term transaction (Yehuala, 2008).

The major difference among formal and informal sector is that the informal sector works without rules and regulations. When formal credit institutions are existed, informal borrowing reduces but eliminates (Singh, 1993). The two forms of credit sources are achieving different purposes for household's transfer of resources. Generally, financial sources in Ethiopia consist of commercial banks, insurance companies, microfinance institutions, multipurpose cooperatives and moneylenders.

There are different microfinance institutions that are established and operating in order to solve the credit access problem of the poor farm households in Amhara region (Befekadu, 2007). This is because of an increase in farmers request for credit and an increase in population number from time to time. Now a day's credit clients and individual voluntary savers are increased in Amhara region.

The entire resolution of accessing agricultural credit for small landholder farmers would be to enable operational and capital investment where farmers get credit to buy seed, fertilizer and other equipment during the planting season. It plays a basic role in covering consumption insufficiencies of farm households and used as income transfer instrument to eradicate the imbalances in income distribution among the small, middle, and big farmers.

Generally, there is unresolved issues as far as small landholder farmers are concerned which is the problem faced by those farmers in obtaining formal credit from banks and microfinance institutions. For example, individual characteristics and institutional characteristics have mixed impact on accessibility of formal credit and the result is varying across countries (Ahmed, 2016).

Different studies have conducted in different countries by different researchers regarding the factors that affect access to formal credit. Few studies are conducted in Amhara region related with the factors that affect access to formal credit on small landholder farmers. The study indicated that access to formal credit has a positive effect on small landholder farmers' productivity (Deresse & Zerihun, 2018; Gizachew, 2017). But, access to formal credit is still low in Amhara region (Obse, 2015).

1.2. Statement of the Problem

Credit has become progressively known to be influential mechanism to lift rural poor out of miserable poverty. Credit plays a vital role in expanding farming productivity through rising up the production assets (Chisasa, 2019).It also allows small landholder farmers to capitalize their land improvements and thereby to approve new agricultural expertise's like high-yielding seeds and fertilizers that rise their productivity and income (Zeller& Sharma 2000). Credit expands the well-being of the rural poor over financing consumption and dropping the opportunity cost of highly valued assets and adopting laborsaving technologies (Zeller, 1994). Furthermore, it is important to insure the rural poor against the vulnerability of

shocks (flood, drought and others) by reducing the cost of the farmer to cope up with those shocks. Generally, Credit is critical to attain rapid and sustainable development (Jemaneh, 2002).

Unavailability of formal credit access limits the rural small landholder farmers their ability to expand productivity and thereby improve their living standard. Formal credit institutions like traditional commercial banks and development banks are not volunteer in delivering financial services to the rural poor farmers (Diagne, 1999). Those institutions are able to spread the credit access to a limited business only. If they provide, they need different types of requirements from poor farmers such as collateral (Jemaneh, 2002). To address these difficulties, the Ethiopian government recognized microfinance institutions (MFIs) to reach a majority of rural poor. According to Bizuayehu et al., 2019), microfinance institutions have no clear rule and regulation with regard to formal credit access to the poorest of the poor showing that MFIs are not working their main task of reaching the poor. A large number of farmers are marginalized, and therefore do not have access to formal credit (as a result of lack of collateral and several requirements imposed by lenders) additionally, as a result of lack of effective enforcing technique and high default of loan repayment of farmers restrict from formal credit access by lenders (Zelalem *et al*., 2013). Access to formal credit is fundamental and still remains a challenge for the growth and survival of small landholder farmers especially in developing countries like sub –Saharan Africa countries including Ethiopia (Chandio *et al*., 2017 & Samuel, 2020). The study undertaken by Akpan *et al*. (2013); Dzadze *et al*. (2012); Shehla & Hasnu (2013) in sub- Saharan African countries to find out what explains access to formal credit by small landholder farmers in those countries indicates that small landholders got higher amount of loan other than medium farmers.

In short, the main concern of this study is the overall aspect of credit access in Bahir Dar Zuria Woreda. The problem of the study was stands from the identified limited or inadequate access to formal credit for small landholder farmers.

A considerable empirical investigation has been made outside Ethiopia on the determinants of access to formal credit; some of them are (Oboh & Kushwaha, 2015; Mohieldin & Wright, 2000; Dzadze et al. 2012; Baiyegunhi & Fraser, 2014). However, their finding lack consistency; for instance, studies conducted by (Kiplimo et al., 2015; Ibrahim & Aliero, 2012; Chivandire & Muhongayire, 2019) indicate that access to formal credit for

farmers rise when there an increase in age and education. Similarly, studies by (Dzadze et al., & Duy et al. 2012; Sebatta et al., 2014) also showed that access to formal credit were determined by saving account, extension contact, distance to lending institution and education level of households. In addition the study by (chisasa, 2019) showed that access to formal credit is not determined by education level of households.

In Ethiopia, prior researchers mainly focused on analysis of determinants of access to credit among smallholder farmers, they didn't give attention to small landholder farmer's microfinance credit access. As per the researcher understanding, from the overall local researcher few researchers (Ayele & Goshu, 2018; kiros, 2012) in Ethiopia have done studies which are used descriptive research design (Muse, 2016; Samuel, 2020; Yehuala, 2008), all the studies conducted out of Bahir Dar., the study by muse (2016) analyzes the determinants of household level access to formal finance in Sidama zone; the study by Samuel (2020) assumed in wolaita zone; the study by Yehuala (2008) assesses determinants of access to formal credit in North Gondar. Those studies are used descriptive research design and do not include all important variable that affect access to formal credit. In addition most of the literatures have inconsistency in their findings. This study seeks to fill the gap by adding new variables that affect small landholder farmers' access to formal credit in Bahir Dar zuria woreda. Therefore, the researcher included some variables besides the studied determinants like, saving culture of farmers in formal credit institutions by small landholder farmers and amount of interest rates charged by formal credit institutions. Finally, the overall purpose of this study was conducted to explore the determinants that affect small landholder farmers' access to formal credit in Bahir Dar zuria woreda and it gives solution for the problems to improve access to formal credit.

This study was intended to deals with the following research questions:

1) What are the demographic characteristics of farmers that affect access to formal credit for small landholder farmers in Bahir Dar Zuria worda?
2) What are the socio-economic characteristics of borrowers that affect access to formal credit for small landholder farmers in Bahir Dar Zuria worda?
3) What are institutional characteristics of lenders that affect access to formal credit in Bahir Dar Zuria Woreda.

1.3. Objectives of the Study

The general objective of the study is to assess the factors affecting access to formal credit of small landholder farmer's in the case of Bahir Dar Zaria Woreda. Specifically, this study tries to achieve the following objectives:

1. To identify the effects of demographic characteristics of farmers on access to formal credit of small landholder farmer's in Bahir Dar Zuria woreda
2. To identify the effects of socio- economic characteristics of farmers on access to formal credit of small landholder farmer's in Bahir Dar Zuria woreda
3. To identify the effect of institutional characteristics of lenders on access to formal credit for small landholder farmers in Bahir Dar Zuria woreda

1.4. Research Hypothesis

Based on objectives of the study, the researcher was hypothesized the following factors to evaluate their impacts on the access to formal credit.

H1. The age of households, have no significant impact on access to formal credit

H2. Sex of the households has no significant impact on access to formal credit

H3. Levels of education have not impact on farmer's access to formal credit.

H4. Collateral has a significant positive impact on access to formal credit for small landholder farmers.

H5. Farm size in hectare has no significance different between farmers in accessing formal credit.

H6. There is significance influence of saving culture on access to formal credit for small landholder farmers.

H7. Information has a significant and positive impact on access to formal credit.

H8. Livestock has a significant negative impact on access to formal credit for small landholder farmers.

H9. Experience in credit use has a significant positive influence on access to formal credit for small landholder farmers.

H10. Distance from lending institutions has no significant influence on access to formal credit for small landholder farmers.

H11. Infrastructure has no significant impact on access to formal credit for small landholder farmers.

H12. The lending procedure of financial institutions has no significant impact on access to formal credit for small landholder farmers.

H13. Deposit interest rate has a significant and positive impact on access to formal credit for small landholder farmers.

1.5. Significance of the Study

The study conducted on factors that affect small landholder farmers' access to formal credit in Bahir Dar Zuria Woreda. Therefore, the study will have the following contributions:

- It will provide useful information on the status of smallholder farmers in accessing agricultural credit from formal credit institutions). The study results will also benefit the development partners and civil society organizations involved in the provision of agricultural credit facilities to smallholder farmers and in improving the lending procedures in order to provide better services to their client
- It also severe as an input for further researchers by providing empirical evidence about access to formal credit to small landholder farmers. In addition to that, it helps the researcher to employ theoretical knowledge in to practice.

1.6. Scope of the Study

The study was delimited to the factors that affect access to formal credit of small landholder farmers'. Geographically the study covers only small landholder farmers under the region of Bahir Dar Zaria Woreda, in Amhara National Regional State (ANRS). The sample size of the study was focused on three selected kebeles; those are Wogelsa, Qembaba and Andasa. The study covers access to Amhara Credit and Saving Institution and commercial bank of Ethiopia. Because those are the main credit providers for farmers in Ethiopia and their branches are expanded all over the area and small landholder farmers are using those institutions

1.7. Organization of the Paper

This thesis is organized in five chapters. The first chapter presents an introduction about the study. It includes background of the study, statement of the problem, objective of the study, hypothesis of the study, significance of the study, and scope of the study. The second chapter describes about review of related literature. It mainly contains two parts-the theoretical literature and empirical literature review. Third chapter is about research methodology. It contains its approach, design, model specification of the study. The fourth chapter focused on data presentation, analysis and its interpretation. Finally, chapter five incorporated the results of the study, conclusion and possible recommendations based on relevant evidence.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter incorporated two important sections. The first one is theoretical review and the other is empirical review.

2.1. An Overview of Access to Formal Credit

Credit can be defined as the control over money and materials used as in exchange of goods and services and it is a promise to repay at a future date (Lawal et al., 2009).

Access to credit mean that where loans for farmers are open and farmers have taken the initiative to apply and utilize these loans. Credit can be available yet not accessible because of restrictions such as costs and strict qualification criteria. Credit touches the performance of agriculture by providing resources for purchase of inputs and the adoption of new technology (Amjad & Hasnu, 2013).

Access to formal credit refers to the ability of individuals to gain external money to allow them ease cash flow problems (Catherine, 2016). It is the most essential means that enables the farmers to increase their tasks or accept new technologies (Dzadze et al., 2012).

A credit business has been crucial to the economic growth of the modern world. Credit situates to use property that would be otherwise lie idle, consequently allowing a country to more fully employ its resources. The existence of credit institutions breaks on the willingness of people to sureness of one another and of court of law to enforce business contracts. Transfer property from those who have money to those who do not but who wish to use it, as in the granting of loans by banks to individuals who plan to initiate a business venture is the major purpose of credit (Yehaula, 2008)

2.1.1. The concept of small landholder farmers

Small landholder farmers classified as subsistence farmers and semi commercial farmers. A subsistence farmer includes the collection of major rural populations, who are still poor. Nevertheless, they try to earn a significant part of their livelihood on farming activities. In addition, their cultivation system is primarily based on traditional technology. Semi

commercial farmer includes the minority of rural population. However those populations are the most promising targeted group of small landholder farmers (Christina, 2017a) .

According to Christina (2017), "small landholders" refers to small landholder farmer who haven't the right to manage their farm land. There are many characteristics of small landholders, notwithstanding of whether they control the land they cultivate or the products they harvest; they harvest generally little produce on moderately little pieces of land. They can grow commodities for export as their leading source of income or as share of an investment of subsistence income making activities.

2.1.2. Theory of access credit

The credit theory was postulated by Stiglitz and Weiss (1981); they provided a framework for analyzing financial market inefficiencies. This framework provides that information asymmetry is the main cause of financial market malfunctioning in developing countries. Financial institutions that advance loans to economic agents are not only interested in the interest they receive on loans, but also the risks of such loans. Most financial institutions screen and monitor borrowers more efficiently than other investors can. They are specialized in gathering private information and treating it. Managing money and deposit accounts, banks own highly strategic information on firm's receipts and expenditures as well as the "way that firms develop (Kashyap, Stein & Wilcox, 1993).

In reference to Stiglitz and Weiss (1981) adverse selection and thus credit rationing still occurs if banks require collateral. They argue that low-risk borrowers expect a lower rate of return on average. Thus, they are less wealthy than high-risk borrowers on average after some periods. Low-risk borrowers are therefore not able to provide more collateral. Increasing collateral requirements may have the same adverse selection effect as a higher interest rate. Walsh (1998) argues that banks only offer contracts in which they simultaneously adjust interest rates and collateral requirements. He proved that there is always a combination of interest rate and collateral requirements so that credit rationing does not occur (Jaffee & Russell, 1996).

The proponents of this theory argue that the most interesting form of credit rationing is equilibrium rationing, where the market has fully adjusted to the public whereby banks ration credit free, available information and where demand for loans for a certain market interest rate is greater than supply. Stiglitz and Weiss (1981) explains that credit rationing occurs if a

financial institution charge the same interest rate to all borrowers, because they cannot distinguish between borrowers and screening borrowers perfectly is too expensive. Both assumptions are very simplifying and do not occur in this manner in the real world. Banks are usually able to distinguish their borrowers up to a certain degree.

2.1.3. Basic principles of credit

According to World Bank (2018), there are five types of credit principle (five Cs).

Principle of character: is the first C more specifically refers to credit history, a borrower's status or record of accomplishment for repaying debts**.** This information appears on the borrower's credit report.

Principle of capacity: it measures the borrower's ability to repay their credit by comparing income against recurring debt and assessing the borrower's debt-to-income ratio.

Principle of capital:

Lenders are considering any capital the borrower puts toward a potential investment.

Principle of collateral:

It is important for the borrowers as a secure loan and it gives the lender as assurance when the borrower defaults on the loan, the lender can get something back by repossessing the collateral.

Principle of condition:

It refers to how a borrower intends to use the money. Condition of loan such as interest rate, amount of principal and influence the lenders desire to finance the borrower.

2.1.4. Credit in rural development

Agricultural credit is the short-term inputs moved to a willing borrower for agricultural purpose, with the borrower's potential willingness and promise to repay in particular for after use and the confidence by the lender that the borrower will comply with terms, utilization and recompense with, or without monitoring (Jan & Khan, 2012). They also defined that agricultural credit is a financial support that a farmer can get in order to link the gap between his/her income and expenditure in the field and noted that it is a basic technique in the development plan of agricultural segment. In short, credit is a sum of money in favor of the person to whom control over it, and who undertakes to pay it back.

As Yehuala (2008) cited in his thesis, kebede (1995) Credit is important for traditional agriculture more productive through purchase of farm tools, other farm tools, introduction to modern agricultural technology.it also used as an instrument for market stability.

According to Dzadze et al., (2012) at a certain period of agricultural improvement agricultural credit clearly does become a strong force for additional enhancement. Provision of credit is an important aspect of local development because it helps to achieve sustainable growth of agriculture. Local credit enable farmers to afford expensive agricultural technology which boost agricultural production (Poliquit, 2006).

2.1.5. Types of rural credit

There are two types of rural credit in unindustrialized countries. They are formal and informal credit. Formal credit institutions are works together with intermediary between depositors and lenders by charging relatively low interest rates. According to Dejene (1993) the credit interest rate is 7% for individual farmers and private enterprises and 6% for state and collective farms (NBE Credit Regulation NBC/CR 1). The greatest agricultural finances of the AIDB (89%) go to state farms which account for not more than 5% of the total agricultural output, whereas the private peasant sector receives an unimportant amount of loans (less than 1%). In informal agricultural credit the cash is given by private persons, professional moneylenders, land lords, friends and relatives, traders, commission agents (Mohieldin & Wright, 2000).

When formal credit institutions are existed, informal borrowing reduces but not completely eliminate. This indicated that formal and informal sources are achieving different purposes for the household's transfer of resources. Formal and informal credit is mutably no interchangeable as a result; formal credit is required and mostly used for agricultural production purposes and investment in extra –farm revenue creating actions however informal credit maybe important for consumption-smoothing purposes (Atieno, 2001).

The practical indication also advises that the imperfect substitutability among formal and informal credit redirects to some extent the presence of due dates and conditionally on informal loan contracts (Diagne, 1999).

According to Dejene (1993) informal credit markets are appropriate only for sectors that were indirectly productive and through which the expenses for social duties was met. In addition to this informal credit, markets are not homogeneous and they are a part of the

dominant political, social and economic networks, including low transaction cost for credit supply.

Generally there are two types of rural credit sources (formal and informal credit).

2.1.4.1. Formal Financial Institutions in Ethiopia

Financial institutions are classified as governmental or private organizations, they have various functions. For instance, gathering money from savers and guiding those savers to individual households, and businesses observing for credit. Financial institutions are composed of deposit-type institutions (bank and non-bank contractual saving institutions), personal and business financial companies, government and quasi-government agencies, and miscellaneous lenders (Greenwald & Associates, 1983 cited as Sisay, 2008).

Formal financial institutions are an organization which is owned, controlled, licensed and registered by Governments (Mohieldin & Wright, 2000). In Ethiopia the expansion of financial sector is a long history and involved collection of banking and non-banking sectors. Financial institutions in Ethiopia include; commercial banks, development banks, specialized financial institutions, insurance companies, credit and savings cooperative, microfinance institutions (owned by regional governments, NGOs, associations and individuals). Those institutions are structured and managed by national bank of Ethiopia (NBE).

In Ethiopia there were 17 Ethiopian insurance companies, 1 is government owned, 9 of which are composite insurance companies, meaning those that transact both general and long term insurance in Ethiopia, and 8 deal with general insurance only (NBE,2018). Despite strict government regulations through lending quota, bond buying, windfall tax and increased capital requirements, banks are reporting strong profit and paying high dividends.

According to December 2018 report of NBE (2018), the number of banks remained at 18 of which 16 were private and 2 public. There is also the Development Bank of Ethiopia (DBE), which is not considered a commercial bank. Commercial Bank of Ethiopia is the largest, controlling the majority assets of the industry. These banks opened 164 new bank branches during the review quarter, raising the total number of bank branches to 4,625 of which about 34.4% were found in Addis Ababa. The report stated that population to bank branch ratio stood at 20,865.56. Of the total bank branches, the share of public banks was 31.8 percent while private banks accounted for 68.2%.

The Insurance Company of Ethiopia are increased their branches to 518 from 465 a year ago and their total capital reached Birr 4.7 billion, of which 74.6 percent was that of private insurers. Of the total branches, about 53.9 percent were located in Addis Ababa (NBE, 2018). In formal credit institutions there are three types of formal institutions. The first one is microfinance, the second one is Amhara credit and saving and lastly cooperatives

Microfinance institutions in Ethiopia

Microfinance is the system of delivering of a wide type of financial services to low-income micro enterprises and households. It is a method of financial development that has primarily motivated on easing poverty by providing financial services to the poor (Bizuayehu et al., 2019)

Microfinance, also named as microcredit, is a type of banking service providing to jobless or low-income individuals or groups who else would have no other access to financial services (Mohieldin & Wright, 2000). In Ethiopia there were 36 micro-finance institutions (MFIs) which organized Birr 28.4 billion in saving deposit. The deposits of MFIs increase annually by 40.2% whereas their credit expanded 38.5 percent (NBE, 2018). The MFIs had a total of 1,755 branches and sub branches, according to Second Quarter NBE bulletin 2017/18. The total number of active borrowing clients of the microfinance institutions in Ethiopia reached over 2.4 million customers.

In developing countries the aim of microfinance institution is by spreading microfinance opportunities, people have access to small amounts of credit, which can then discontinue poverty at a quick step. The extent to which microfinance programs are able to reach the poorest of the poor remains an open argument (Sisay, 2008). Microfinance is also able to let entrepreneurs in developing countries be able to create new employment opportunities for others, with more people able to work and earn an income, the rest of the local economy benefits as there are more revenues available to move through local businesses and service providers. The combination of credit schemes in Ethiopia is initiated by local NGOs. Like the Relief Society of Tigray (REST) and Association for Rehabilitation and Development in Amhara (ARDA).

Amhara credit and saving institution (ACSI)

ACSI can be treated as the first modern microfinance institution in Ethiopia and its task is drawn back to 1995 as a branch by the introduction of the previous Ethiopian relief

organization (ERO) at this time organization for Rehabilitation and development in Amhara (ORDA), an original NGO involved in progress events in Amhara region (Gobezie, 2005). ACSI presently has wide subdivision networks, covering all districts and sub-districts of the Amhara Region, the second populous regional state in Ethiopia. ACSI delivers all chief types of financial services including voluntary savings, credit, money transfer, and fund management services. To expand its reach to the community, ACSI is currently pilot testing mobile banking services (M-BIRR, POS services, e-voucher, and others). ACSI strongly believes that over the coming years, further efforts have to be enhanced to diversify the available financial products and services (ACSI, 2017).

As of March 2017, ACSI has more than 1.1 million active borrowers and 5.4 million active voluntary savings clients. On same period, the total net savings mobilized and the gross outstanding loan amount is Birr 10.8 billion and Birr 11.2 billion, respectively. ACSI's outreach covers the poorest of the poor, all areas including marginalized and geographically remote locations, trying to address most of the financial service needs of economic sectors. ACSI is currently initiating to establish subsidiary companies that can support the development and effectiveness of the microfinance sector, among which the ACSI Training and Research Center (ACSI TRC) is one. ACSI Training and Research Center is recently established to fill the capacity building gap particularly in the areas of training, research, and consultancy services needs of the microfinance and other development programs and industries (Asci, 2017).

Cooperatives

According to Berhan and Geremew (2018) Cooperatives are a business enterprise that searches for to slowdown a balance among pursuing profit and meeting the needs and interests of members and their communities. Cooperatives are not only making available for members with economic opportunities, but also provide them a wide range of services and opportunities. In the past period Ethiopia has experienced modern cooperative movement since 1960 (Sisay, 2008). While the cooperative principles and values were announced in the last imperial period, which is limited to their number, membership and amount of capital mainly paying attention to agricultural activities.

In Ethiopia there was a strong enlargement of cooperative's after the 1974 revolution, however, the international principles and values were despoiled by the government in favor of

encouraging the socialist ideology during the rural areas of the country using cooperatives as means of reaching its objective. This resulted in that; several cooperatives in rural areas remained strong feeling during 1991. In the meantime 1991, still; rules of economic liberalization in Ethiopia have been working in liberating the economy from inelastic state control with uncovering Ethiopians to domestic and international free market competition. Bring about quicker and maintainable economic growth and to make sure that the welfares of growth spread to the poor is the foremost essential agenda of the Government. In proportion to this rule, the government has provided high priority to develop agriculture lead industrialization economic growth partly by stipulating the development of autonomous cooperatives to strengthen the productivity of market and financial sector in the rural areas (Berhan & Geremew,2018). Cooperatives have obtained due attention at least in the development discourse as well as programs design to reduce poverty.

Cooperatives are community-based, rooted in democracy, flexible, and have participatory involvement, which makes them well suited for economic development (Tesfamariam, 2015). In the service provision, cooperatives make decisions that balance the need for profitability with the welfare of their members and the community, which they serve. As cooperatives foster economies of scope and scale, they increase the bargaining power of their members providing them, among other benefits, higher income and social protection is the leading (Bernard, 2013). Cooperative type of business is important for small land – holding, developing countries like, Ethiopia. Because cooperatives promote income distribution, reduce poverty and vulnerability, and improve quality of life and social welfare. Whereas the number, type and the distribution differs from region to region, during 2018, there are more than 26,672 registered primary cooperatives compliant 5,926,433 members throughout the country (Berhan & Geremew, 2018)**.**

In Ethiopia, cooperatives are playing a crucial role in the country's past and current development strategy. As of 2015, there were 56,044 primary cooperatives, both agricultural and non-agricultural having nine million members throughout the country. Of these, 8,435 primary cooperatives are organized in 309 unions. Agricultural cooperatives, however, only account for about one-fourth of cooperatives in the country (Eshetie & Geremew, 2018).

2.1.4.2. Informal Credit Institutions in Ethiopia

Aryeetey et al. (2005) defines informal finance works without rules and regulations forced on the farmers by formal financial institutions. Informal finance includes, professional money lenders, rotating savings and credit associations (ROSCAs), operations of savings and credit associations, and part-time moneylenders like, grain millers, traders, smallholder farmers, employers, relative and friends, as well as cooperative societies.

Informal financial institutions work without physical collateral, involving small loans and short term-transactions, and are described by adaptability and flexibility of operations in certain areas (Guirkinger, 2007). Among the characteristics of informal sector, no data on their activities are available through official statistical office (Abrham,2014). Informal finance is based on mutual trust because it operates outside state control and legal business regulations. The material collateral such as character, reputation, kinship, and family ties-plays an important role in borrowing from informal financial sources (Dejene, 1993). And he also defined that the large mass of the Ethiopian population makes little or no use of the formal savings and lending institutions. In Ethiopia more than 80% of the population lives in rural areas, small number of banks and credit associations that are presently operational are limited to urban areas. Besides, these banks are less used even by the urban population. As a result, the urban people used the non-formal sources like, relatives and friends, money lenders, neighbors, Iddir, Iqqub and Mahaber. From those the primary sources used by the urban people are relative and friends, money lenders and Iqqub and Iddir. According to Sable (1986) the original purpose of iddir is the burial of the dead. Both iddir and mahber are used for community service like school, construction of roads and installation of public utilities.

2.1.6. Rural finance reform in ethiopia

After the removal of power of the Derge government, changes in economic programs as well as political, administrative and institutional structures initiated to be announced by the new government. Later, financial liberalization was among the reforms that have been undertaken by the new government. Financial liberalization is central part of an effective growth strategy. In Ethiopia financial liberalization started at the end of 1992. In Ethiopia financial reforms, reduction of priority of access to credit, interest rate liberalization, restructuring and introduction of profitability criteria, reduced direct government control on financial intermediaries and limits bank loans to the government, enhancement of the supervisory,

regulatory and legal infrastructure of the NBE, allowing private financial intermediaries through new entry of domestic private intermediaries (rather than privatization of the existing ones) and introduction of treasury bills over auction markets (Sisay, 2008).

2.2. An Empirical Review on Determinants of Access to Credit

This study is mostly conduct in the context of unindustrialized countries; the main concern is given to assess empirical evidences in relation of small landholder farmers' access to formal credit in Ethiopia. Many studies indicate small landholder farmers' access to formal credit as problem of developing countries.

2.2.1. Empirical reviews outside Africa

Amja & Hasnu (2007) empirically investigated an analysis of smallholder's access to rural credit and the cost of borrowing using survey data in Pakistan. The result shows that infrastructure quality is the most important factor in determining access to formal credit. In this study, formal borrowers have significantly higher values rather than informal borrowers.

Hussain & Thapa (2015) investigated on credit fungibility and analysis its factors in Pakistan. Smallholders borrowed for the purpose of repayment of outstanding loans in formal credit institutions. Moreover, Saqib et al. (2018), empirically investigated factors influencing farmers access to agricultural in a flood disaster in risk-prone area in Pakistan. The result of weighted least square regression shows that socio-economic factors play a key role in farmer's access to credit. That means Education, farming experience and farm size were significant factors in farmer's access to formal credit.

As discussed by Chandio et al.(2017) in Pakistan, credit is needed by different parts of the world, mainly for the purpose of capital requirement to improve land, purchase of fertilizers, seeds, pesticides and purchase of farm machinery. In this study, the researchers used probit regression model. The result of regression shows that gender, education level, farming experience, farm size and availability of collateral have positive effect on access to formal credit. However, age has a negative impact on access to formal credit.

Kochar (1997), study on the determinants of access to formal credit in India; an empirical analysis using switching regression approach. This study reveals that the operation of formal

credit sectors are significantly affected the rural economy, in both levels of income and income inequality.

Moreover, Poliquit (2006) studied on the accessibility of rural credit among small farmers in Philippines. The result of the study show that most of the respondents borrow for farm production activities, usually during the planting period. Similarly, the farmers borrow more fundamentally for the purchase of production responses like seeds, fertilizers and chemical.

2.2.2. Empirical reviews in other African countries

Kiplimo et al. (2015), tried to found the main factors that affect smallholder farmers financial services in Kenya. The result of this study reveals that household's education levels were statistically significant with positive effect on access to formal credit. Conversely, distances to the credit source were statistically significant with negative influence on access to formal credit financial services by using logistic regression model.

Owuor (2009) observed in Kenya that literacy and education level has a significant positive influence on farm households' ability to access credit information. Using discriminant analysis to differentiate between borrowers, non-borrowers and potential borrowers, Miller and Landman (1983) realized that higher resource base, higher risk management and higher level of education characterized borrowers.

Ololade & Olagunju (2013) studied on the determinants of credit access by rural farmers in Oyo state Nigeria by using cross-sectional data and binomial logistic regression model. The finding of these study indicated that there is significant relationship between gender, guarantor, high interest rate and access to formal credit.

Akpan et al. (2013) conducted a study on the entitled that determinants of access and demand for credit among poultry farmers in southern Nigeria by using double hurdle model. The result of hurdle indicated that farmer's age, gender, education, farm size and distance from farmer's resident to lending source are important determinants of access to credit.

Oboh & Kushwaha (2015) studied on the effect of socio-economic determinants of farmer's loan size by arable crop farmers in Benue State, Nigeria. In this study, the researchers used multiple regression analysis. The result of regression analysis indicated that distance, farm size, length of loan delay and visitation by lenders have positive significant on access to formal credit.

Udry (1991) focused on the entitled a competitive analysis of rural credit in northern Nigeria. Using a competitive model of the credit market, the result of the study showed that seasonal fluctuations in income, gender, education level of the household head, family size and area of operational holdings are important determinant of access to formal credit.

Anang et al., (2015), conducted a study in June (2015) that entitled on access to agricultural microcredit in Ghana. In this study, the result of Hackman selection model indicated that gender, cattle ownership and improved technology adoption were significant factors in determining farmer's loan size.

Dzadze et al. (2012) also conducted on factors that limit or increase smallholder farmer's access to formal credit in abura asebu Kwamankese district of the central region of Ghana by using logistics regression model. The regression result shows that extension contact, saving habit and education level were significant impact on farmer's access to formal credit. This study stated that the odd of a smallholder accessing formal credit is increase by saving habit, education and extension contact respectively.

Mpuga (2010) examines constraints in access to and demand for rural credit in Uganda. The study used Probit, Tobit and multinomial logit model. The result of the study showed that age of an individual emphatically identified with the choice to apply for credit and the measure of credit applied. Mpuga adds that young farmers tend to save and seek credit as opposed to old farmers. Tang et al. (2010) opposed Mpuga (2010) stating that the opposite is quite true since older farmers have more social capital and networks compared to the young farmers. (Nwaru, 2009) disagreed with both stating that age of an individual does not affect demand on credit.

A study in Madagascar by Zeller (1994) focused on the determinants of credit rationing among formal and informal lenders. The regression result indicated that the probability of applying for informal credit increases with age, years of education, and number of sick days of household during the recall period. Or, the probability of being credit constrained by the informal lender increases with age, and years of education.

Mohieldin and Wright (2000) examine empirically the markets for formal and informal credit in Egypt. The result indicated that educational level, ownership of land, total assets, and size of the households are significant factors of access to formal credit by using a probit analysis.

Chivandire (2019) studied on identifying the major factors affecting access to formal credit by smallholder farmers with particular reference to Chivi district, Zimbabwe. The logit model reveals that demographic factors like, age of household head, sex, household size, marital status and household education level and economic activities of households are determinant of access to formal credit.

2.2.3. Empirical Reviews in Ethiopia

Hussein (2007) conducted on understand and explain farm household economic behavior with reference to saving, credit and production efficiency under imperfect financial market conditions in Southeastern Ethiopia. Saving behavior of farm households was affected by factors related more to incentives and opportunities to save than to ability to save. Data was analyzed using stochastic frontier analysis and limited dependent variable econometric tools.

Kiros (2012) observed in Tigray region that education, land size, distance and livestock ownership are the major determinants of credit access. The researcher uses bivariate probit model.

Ayele & Goshu (2018), Examined factors determining microfinance loan utilization by smallholder farmers from Omo Microfinance institution in Lemo District of Hadiya Zone. The study uses univariate probit regression model. The results showed that literacy, household size, size of landholding and distance from residence to lending center were the significant determinants of access to formal credit.

Muse (2016) also conducted a study that entitled on the "determinants of household level access to formal financial services" in Hawasa, Sidama zone. In his study Binary logistic regression model was used. The result of the study showed that demographic factors like, (Age, Sex and education), institutional factors like, (participation of households in extension package program, lending procedure, family labor), socioeconomic factors like, (size of farm land, livestock ownership, experience in credit use), communication factors like, (distance from lending institutions and extension contact) are the most important determinants of access to formal credit.

Sisay (2008) studied on smallholder farmer's access to formal credit in Amhara region, north Gondar. The study uses binary logistic regression model. The result of logit model indicates access to formal credit was positively and significantly affected by participation in extension package programs; farm household's experiences in credit uses from formal credit

institutions and total cultivated land size. But, number of livestock unit in tropical livestock unit (TLU) and farmers perception of group lending negatively and significantly affect access to formal credit.

2.3. Summary and Knowledge Gap

Access to credit is fundamental for small landholder farmers in unindustrialized countries of the world. Credit leads to an increase in spending, higher GDP (gross domestic product) and thereby faster productivity growth, thus increasing income levels in the economy. Access to credit enables operational and capital investment where farmers get credit to buy seed, fertilizer and other equipment during the planting season. It plays a basic role in covering consumption insufficiencies of farm households and used as income transfer instrument to eradicate the imbalances in income distribution among the small, middle, and big farmers. However, access to formal credit is affected by both socio-economic and institutional variables.

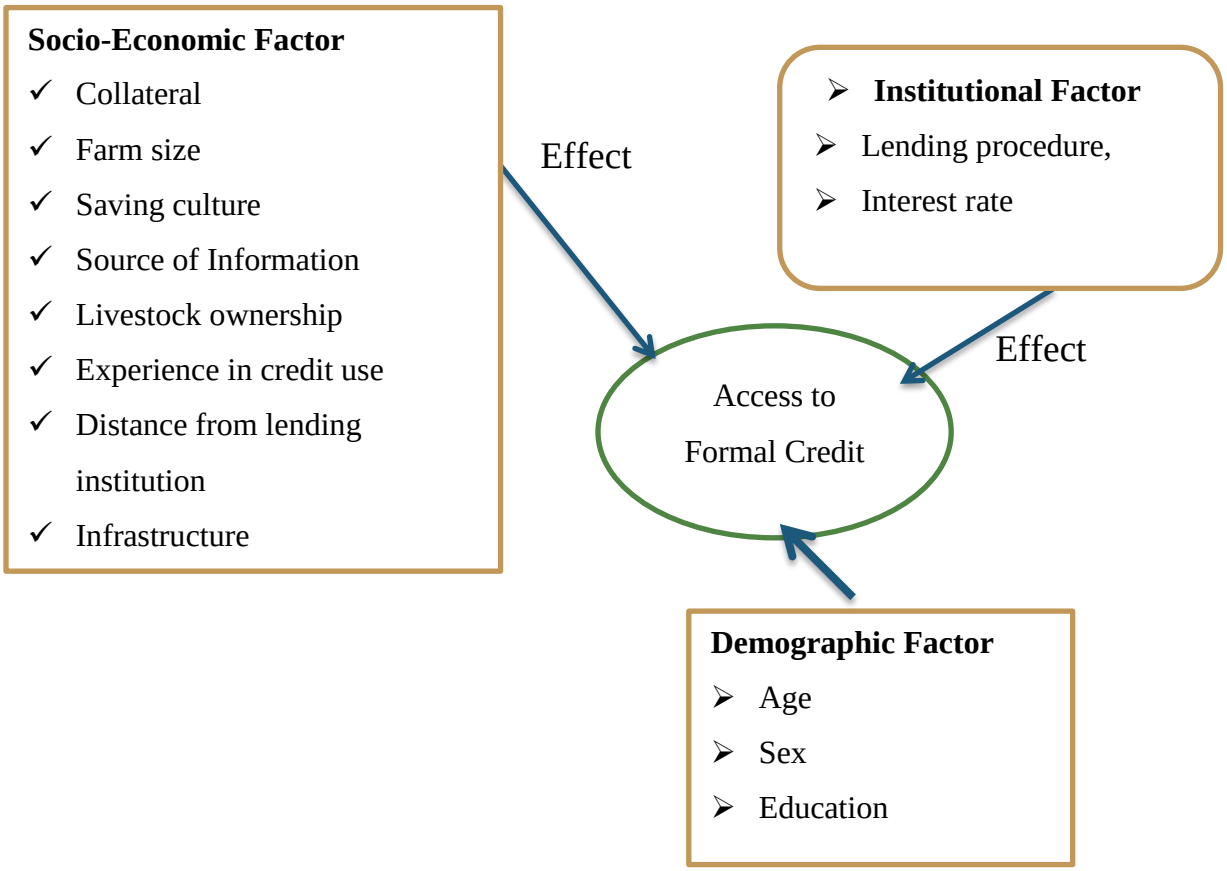
In Ethiopia, some researchers conducted in various regions. For example, the study by muse (2016) analyzes the determinants of household level access to formal finance in Sidama zone; the study by Samuel (2020) assumed in wolaita zone; the study by Sisay (2008) assesses determinants of access to formal credit in North Gondar. However, those studies are limited in describing rather than explaining the factors contributing for access to formal credit. In addition, Most of the empirical literatures are the same but; the studies are different in their research design, approach, and coverage of geographical area. In addition, there is inconsistency in their research question, methodology, objectives, most of the literatures focuses on both formal and informal credit institutions and does not include all-important variables on their study.

Therefore, the researcher tries to fill the gap by adding such two variables like of saving culture of households in formal credit institutions and amount deposit interest rate by formal credit institutions that affect small landholder farmers' access to formal credit for the case of Bahir Dar zuria woreda using 360 small landholder farmers.

2.4. Conceptual Framework

Conceptual framework is important for readers easily understanding the relationship between variables. Thus, based on the theories of overall literatures conceptual frameworks developed as follows:

Figure 1: Conceptual framework for the study



Source: Represented by the researcher based on literature Review (2020)

CHAPTER THREE: RESEARCH METHODOLOGY

The previous chapter deals with review of related literature on determinants of access to formal credit for small landholder farmers. This chapter provides a brief overview of the research approach, research design, population of the study, sampling method, method of data collection and its source, data analyses and model specification of the study.

3.1. Description of the study area

Bahir Dar Zuria Woreda approximately covers an area of 1,283.6 km, and includes 36 kebeles, three of which are partially included in the study. The District is bounded in the East by South Gondar Zone, in the West by Mecha and Achefer Districts and by Lake Tana, Yelimanadensa District in the North and South, respectively. The topographic feature of the District indicates that approximately 48% can be defined as rolling, 32% hilly, 13% mountainous, and 7% valleys. The altitude ranges from 1,750 to 2,300 m above sea level (m.a.s.l). Agriculture is the main stay of the people in the study area as it contributes about 100% of the population with in the area depends on this sector of the economy (CSA, 2019). However; it is subsistence, low in production and productivity and backward in its production system and cultural practices involved. In addition to this, land holding of the farmers, which is the main input of agriculture, is small and highly fragmented as a result of increasing population pressure from time to time (Bahir Dar Zuria Office of Agriculture (BDZoA, 2020)

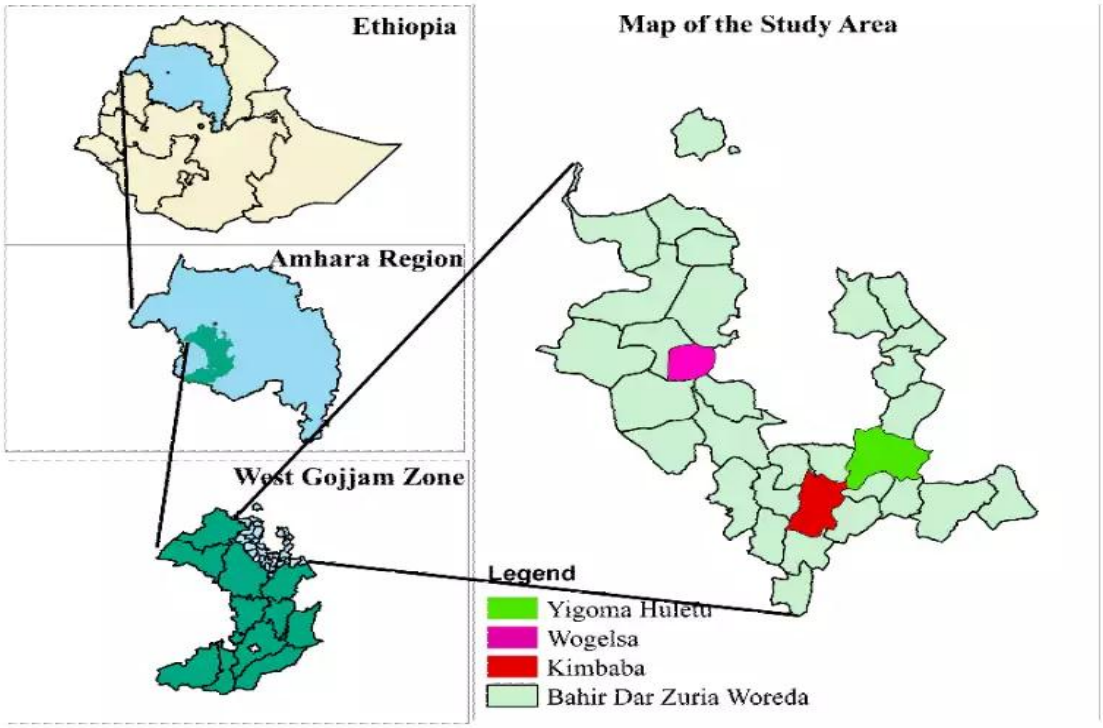


Figure 2: Map of the study area

3.2. Research approach

According to Creswell (2003), the three types of research approach that are familiar to business and social science research are quantitative, qualitative and mixed approaches. Quantitative research is based on the measurement of quantity or amount. It is applicable to phenomena that can be expressed in terms of quantity (Kothari, 2004). Quantitative research is a means for testing objective theories by examining the relationship among variables (Creswell, 2003). According to Jonker and Pennink (2010), quantitative research is often regarded as being purely scientific, justifiable, and precise and based on facts often reflected in exact figures. This approach often appears when the audience consists of individuals or readers with a quantitative orientation. This quantitative research approach can be further sub classified into inferential (survey research), experimental and simulation approaches to research. Qualitative research is concerned with qualitative phenomenon, which means that, phenomena relating to or involving quality or kind (Kothari, 2004). In this approach the researcher often makes knowledge claims based primarily on the multiple meanings of individual experiences, socially and historically constructed meanings, participation in issues,

collaboration or change oriented with an intent of developing a theory or pattern or advocacy/participatory perspectives (Creswell, 2003, p.21).

This study applied mixed research approach to examine the relationship between access to formal credit and various independent variables.

From qualitative the researcher used structured questionnaire and qualitative interview with ACSI manager. From quantitative document analysis were used.

3.3. Research design

A research design is the plan and procedure for the research to choice from broad assumption method of data collection and analysis (Creswell, 2014). It is the overall plan for the conceptual research problems to the pertinent and achievable research. In other words, a research design expresses what data is required, what methods are appropriate to collect and analysis (Saunders, Lewis & Thornhill, 2009). According to Lewis et al. (2009), there are three types of design in research study. Those are descriptive research design, exploratory research design and explanatory research design. Descriptive research studies are those studies, which are concerned with describing the characteristics of a particular individual, or group. It helps to provide an accurate picture about the phenomena event or people. The main aim of descriptive research is to provide an accurate and valid representation of variables that are relevant to the research question. Exploratory research design that are addressing a subject about which there are high levels of uncertainty and ignorance about the subject, and when the problem is not all right understood or little or no existing research on the topic matter. The main aim of exploratory research is to identify the boundaries of the environment in which the issues, opportunities or situations of interest are likely to reside and to identify the silent factors or variables that might be found there and be of relevance to the research. In explanatory research design the main aim is to identify any causal links between the factors or variables that pertain to the research problem. Since the current research is on the determinants of access to formal credit, it used both descriptive and explanatory research design.

3.4. Population of the Study

The target population of the study consists of small landholder farmers in Bahir Dar zuria district. There are 182,760 households in Bahir Dar Zuria district obtained from office of agriculture, which is 51% are males and 49% are females. Among the total population of Bahir Dar Zuria woreda, 40,893 are rural agricultural household heads, out of which 50.1% and 49.9% are male and female headed households respectively (Bahir Dar Zuria Woreda Office of Agriculture, 2019).

3.5. Sample size

The total target population of this study is 40,893. According to Kothari (2004), due to many factors the researcher is determining the sample size.

The researcher is confident at 95% and at specified level of precision e (0.05).

The simplified formula developed by Yamane (1967) is as follows

$$n = \frac{N}{1 + \mathrm{N}(e)2}$$

Where, N- population size

n- Sample size

e- Margin of error (5%)

By inserting the above formula $n = \frac{40,893}{1+40,893(0.5)2}$ = 396

Table 3. 1: Target population of the study

Name of kebeles	Male	Female	Total	Required sample size from each kebeles	Strata actual sample size
Qembaba	1239	276	1515	396∗ 1515/ 4275 = **140**	F =140* 276/1515= 26 M=140*1239/1515=114
Wogelsa	909	158	1067	396* 1067/ 4275 = **99**	F= 99* 158/1067= 15 M= 99*909/1067= 84
Andasa	1449	244	1693	396* 1693/ 4275 = **157**	F=157*244/1693= 23 M=157*1449/1693=134
Total	**3597**	**678**	**4275**	**396**	**396**

Female headed HHs	64				
Male headed HHs	332				

Source: data collect from office of agriculture and own computation, 2021

3.6. Sampling Technique and procedure

A multi-stage sampling technique was used to select 360 small landholder farmers for the study. Firstly, Bahir Dar zuria Woreda was purposively chosen, due to there is financial institutions in each kebeles which gives loan for small landholder farmers, majority of the population makes farming their primary occupation and main source of income. The woreda contains 36 rural kebeles. Secondly, simple random sampling was used to select 3 out of 36 kebeles using lottery method. In the third stage, sample size was determined using simplified formula provided by Yamane (1997). Out of the total 40,893 households, 360 households were selected using simple random sampling methods. Final respondents were drawn to each representative kebeles by using following proportional allocation principle.

3.7. Method of data collection and its sources

In order to achieve the objectives of the study, cross-sectional data were collected from both primary and secondary sources. Primary data were obtained through structured questionnaire from small landholder farmers and interview. Secondary data were collected from Bahir Dar Zuria Woreda office of agriculture, Amhara credit and saving institutions (ACSIs), commercial bank of Ethiopia (CBE), unpublished study documents and other official reports. All questions are prepared in English and translated to Amharic language for collecting data from farmers.

3.8. Method of Data Analysis

The researcher used descriptive and inferential statistics like chi-square test for data analysis. Descriptive Statistics such as percentage, frequency, cross-tab and regression was used to summarize the results that generated from respondents of research questionnaire and provided a clear picture for both reader and researcher. Binary logistic regression was used to

assess the explanatory variables and access to formal credit of small landholder farmer's with the help of SPSS version 23.

Finally, content analysis is used to analyze qualitative data generated from interview and documents.

3.8.1. Tests of Validity and Reliability

3.8.1.1.Validity test

Validity refers to the extent to which a measure adequately represents the underlying construct that is supposed to measure. According to Hair, Black, Babin, & Anderson (2014), validity is the degree to which a measure accurately represents what it is supposed to. It means that the instrument measures what it is supposed to measure, that all questions are accurately measuring the concepts they are intending to measure, and that every question relates directly and statistically to the impact demographic, socio-economic and institutional characteristics on access to formal credit. Structured questionnaire was used to collect the data.

In order to test the acceptance and eligibility of the questionnaire, the researcher revised literature included the advisors comment in the preparation of the questionnaire in order to validate it.

3.8.1.2.Reliability test

In order to make the questionnaire is reliable; the researcher used a pilot method of study, that something to be tested before wider introduction. In order to know whether, the internal consistency, the reliability is good or not, the researcher used Cronbach's alpha test. Thus, it is better to see the Cronbach's alpha reliability test statistics result, which ranges from -1 to +1. if the Cronbach's alpha output becomes greater than 0.7, it indicates that all the items or the questions with regard to the respective variable are good, highly correlated and reliable. Cronbach's alpha is exist between 0.60 to 0.70, it indicates fair reliability, and the coefficient from 0.70 to 0.80 is indicated as a good reliability and if the coefficient is larger than 0.80, it is considered as an excellent reliability which means that there are high internal consistency among the variables.

3.9. Assumption of binary logistic regression model

As the dependent variable of the study was dichotomous, binary logistic regression was used for the main analysis of the determinants of access to formal credit. Binary logistic regression is used when:

- The dependent variable to binary.
- The observation is independent of each other. On the other hand, it means the observations should not come from repeated measurements or matched data.
- There is little or no multi-collinearity among the explanatory variables. Means the independent variables should not be too highly correlated with each other.
- There is a linear relationship among independent variables and log odds. This analysis does not require the dependent variable and independent variables to be related linearly, it requires the independent variables are linearly related to the log odds.
- There is a large sample size.

The LR test is performed by estimating two models and comparing the fit of one model to the fit of the other. Removing predictor variables from a model will almost always make the model fit less well (i.e., a model will have a lower log likelihood), but it is necessary to test whether the observed difference in model fit is statistically significant. Likelihood test statistic chi-square (χ 2) is commonly used for examining the overall fitness of the logistic regression model to see that the correspondence between observed data and the values expected based on theory. The likelihood ratio test, also called log-likelihood test, is based on -2LL (-2 times log likelihood). The likelihood ratio statistic is obtained by subtracting two times log likelihood (-2LL) for the final (full) model from the log likelihood for the intercept only model. This log likelihood-ratio test uses the ratio of the maximized value of the likelihood function for the intercept only model L0 over the maximized value of the likelihood function for the full model L1. Where the likelihood test statistic is given by

x^2 = -2(lnL_0-ln_1 = -2(LL_0-LL_1)

Where, LL_0 is the likelihood value of the model that has the intercept term only and LL1 is the log likelihood value of the full model, where L_0 is the likelihood function of null model and ln_1 is the likelihood function of the full model.

The likelihood ratio statistic has a chi-square distribution and it tests that whether the null hypothesis of all logistic regression's coefficients except the constant are becomes zero.

Thereon, when a p- value is less than 5% threshold, it leads to reject the null hypotheses that are all the predictor effects are zero.

The Wald statistic is an alternative test, which is commonly used to test the significance of individual logistic regression coefficients for each independent variable (that is to test the null Hypothesis in logistic regression model that a particular legit coefficient is zero. This statistic is used to test whether the parameter associated with a predictor variable is zero or not. If the parameter of a predictor variable is significantly different from zero, the associated variable should be included in the model. Wald test statistic has a chi-square distribution with one degree of freedom, and used to test the significance of individual coefficients in the model and the hypothesis to be tested is:H0:$\beta j=0$;against $\beta j\neq 0, j=1,\ldots,k$ at α level of significance.

Hosmer- Lemeshow Goodness test is the other method of testing the goodness of fit for logistic regression model. As per Hosmer- lemeshow goodness of fit test, if p-value is greater than 0.05 thresholds, the null hypothesis should be accepted, i. e., no need of rejecting the null hypothesis. That means there is no difference between observed data and predicted model values expected based on theory, it shows that the model estimates fit the data adequately.

3.10. Model Specification

To check the relationship between dependent and independent variable and significance of the overall model at 95 % level of significance, the researcher used binary logistics regression model that is a logit distribution function model developed by (J. S Kramer, 1991). Since the outcome variable access to formal credit is binary or dichotomous and the explanatory variables are categorical variables the researcher interested to use binary logistic model.

$$p(yi = 1) = \frac{1}{1 + e^{(-\beta i Xi)}} ---------- (1)$$

$$p(yi = 1) = \frac{1}{1 + e^{-zi}} ----------(2)$$

Where, p (Yi=1) the probability of a farmer has a credit access

Xi= is function of a vector explanatory variables

E= is represents natural logarithms and equation (2) is the cumulative distribution function. 1-p (yi=1) represents the probability of farmers does not have credit credit and represents as;

1-p (yi=1) =1- $\frac{1}{1+ee^{zi}}$---------- (3)

$\frac{p(yi=1)}{1-p(yi=1)} = \frac{1+e^{zi}}{1+e^{-zi}} = e^{zi}$ ---------- (4)

Equation (4) is the odds ratio, which represents the ratio of the probability that a farmer is decided to receive credit to the probability that they are not deciding to receive credit.

Y = f (x) where, Y is dependent variable and X is the set of explanatory variables

$p(Y) = \beta o + \sum \beta ixi + \mu$

Yi = α + X1β1 + X2β2 + X3β3+ X4β4 + X5β5+ X6β6+ X7β7+ X8β8+ X9β9+ X10β10+ X11β11+ X12β12+ X13β13+ ε

$p(ACFC) = \beta 0 + X1\beta 1(DEMO) + X2\beta 2(SOEC) + X2\beta 2(INSTC)\mu$

Where: ACFC= probability of Access to formal credit or not

DEMO= demographic characteristics of farmers

SOECC= Socioeconomic characteristic of farmers

INSTC= Institutional characteristic of lenders

Yi= Access to formal credit; β0 &βi = Coefficients; μ = Error terms; Xi= set of explanatory variables

Where; Yi =1, the respondents response is credit access and Yi= 0, the respondent's response is without access

AGE: age of households

SEX: sex of respondents

EDU: education level of households

COLL: collateral

TCLS: farm size in hectare

SAV: saving culture of respondents

INFORM: source of information

TLU: livestock ownership

EXPFCI: farmers experience in credit use

DISTNT: distance from lending institution

INFRST: infrastructure (road access)

LENPROC: lending procedure of formal credit institutions

INTR: interest rate

Variables Description and Measurement of Variables

Thus, this section explained the variables used as dependent and independent (explanatory) variables in the study. The definitions and measurements that are used for these variables are described as follows.

3.10.1. Dependent variables description

Small landholder farmer's access to formal credit is the dependent variable, which is affected by various independent variables. This variable will be measured by information obtained from direct household survey regarding weather a household is currently user of formal credit service or not**.** Respondents who requested for credit and not effective or rejected and who did not make any request is all together considered as without credit access whereas, respondents that requested and get credit is called with credit access. The dependent variable is Dummy, which represented by the value "1" for with credit access and "0" for without credit access.

3.10.2. Independent variables

Among the number of factors, which have been related to access to formal credit for small landholder farmers, in this study the following demographic, socio-economic and institutional factors were hypothesized to express the dependent variable.

i. **Age:** is a categorical variable, treated as household heads during the time of household survey measured in years. Age is another important demographic factor that does not affects access to formal credit for small landholder farmers. The conclusions by researchers on age and access to formal credit were mixed. Many researchers draw their conclusion based on the idea that mature working age farmers (55-64 years) may have high responsibility and high collateral this makes them higher in accepting credit access. Yehuala (2008) & Mesfin et al., (2017) concludes that older farmers are more credit accessed.

And others such as (Christina, 2017; Abraham, 2014) stated that age of households doesn't affect access to formal credit.

Ha1: The age of households have no significant impact on access to formal credit

ii. **Sex:** is a dummy variable, which assumes a value of "1" if the household head is male and "0" otherwise. According to Kyalo Musembi (2019) male headed households have participate in different meetings and have more exposure to information. In addition, male households have the ability to control economic resources; therefore, it was hypothesized that male-headed households have more access to formal credit from formal credit institutions. However, Dzadze *et al.* (2012) concluded that sex of the household heads does not affect access to formal credit of small landholder farmer's.

Ha2: Sex of the households has no significant impact on access to formal credit

iii. **Educational level of the households**: The level of education is another factor that influences household's willingness to take credit access. Many studies on education and credit access have also been carried out but the results were mixed. Majority of the study conclude that highly educated farmers take credit access. Such as Yehuala (2008) & Muse (2016) described that higher education encourages in taking more financial risk. In addition, Deresse & Zerihun (2018) described that educated people are received more credit. Although some other studies portray that education level does not affect the level of credit access like Ololade & Olagunju (2013b) said that education was not a significant determinant of access to formal credit for farmers. Additionally, Adeola & Ayoade (2009) Level of education does not significantly affect access to credit of farmers.

Ha3: Levels of education have not impact on farmer's access to formal credit.

iv. **Collateral:** is a dummy variable, which takes the value of "1" for those who have collateral availability and "0" otherwise. Small landholder farmers are expected to form a group that can serve as collateral to take credit access from formal credit institutions. However, households perceived that group lending if difficult for access to formal credit from credit sources. Therefore, farmers who have enough number of assets are less likely to go for credit (Samuel Semma, 2020)

Ha4: Collateral has a significant positive impact on access to formal credit for small landholder farmers.

v. **Farm size:** It is the total land size cultivated (sum of owned cultivate land, rented-in land and land secured through sharecropping arrangements) by the household. It is a categorical variable. The larger the cultivated land size the more the labor required that demands

additional capital that might be obtained through credit. Nevertheless, the main hypothesis was that farmers who have larger farm size and those farmers who have smaller farm are not different in accessing credit from formal credit institutions.

Ha5: farm size in hectare has no significance different between farmers in accessing formal credit.

vi. **Saving culture:** is ordinal variable, According to Samuel Semma (2020) when farmers save higher amount of money in financial institutions it could be substituted as collateral in providing credit.

Ha6: There is significance influence of saving culture on access to formal credit for small landholder farmers.

vii. **Information:** is the source of information small landholder farmers get information about formal credit institutions. It is an ordinal variable, A farmer having more information about a formal credit scheme has higher awareness and tendency towards using the formal credit sources and the vice versa. information is assumed to have positive influence on the access to formal credit for small landholder farmers (Erasto Abrham, 2014).

Ha7: Information has a significant and positive impact on access to formal credit.

viii. **Total Livestock ownership:** Is the total number of animals possessed by the household. It is a continuous variable. As the total number of animals in the household increases, the household would be less likely to go for credit (Erasto Abrham, 2014).

Ha8: livestock has a significant negative impact on access to formal credit for small landholder farmers.

ix. **Experience in credit use:** Are a number of years the households get access credit from formal credit institutions. This is a continuous variable; A farmer having more experience in formal credit use will have higher tendency towards using the formal credit sources and vice versa (Gebeyehu et al., 2019)**.**

Ha9: experience in credit use has a significant positive influence on access to formal credit for small landholder farmers.

x. **Distance from lending institution:** It refers to the distance (in km) of the rural households from formal credit institution. Is an ordinal variable (Kidane et al., 2018). A farmer who lives near / far to the lending institutions has no different in location advantage in accessing formal credit.

Ha10: distance from lending institutions has no significant influence on access to formal credit for small landholder farmers.

xi. **Infrastructure:** Particularly all-weather roads that connect rural to urban are taken this road access as determinants for household level access to formal credit in study area. Is an ordinal variable; in this study infrastructure is not the determinant of access to formal credit.

Ha11: Infrastructure has no significant impact on access to formal credit for small landholder farmers.

xii. **Lending procedure:** To get formal finance from credit institutions farmers are predictable to pass over different methods, which is time taking, cumbersome and sometimes difficult to understand. It is an ordinal variable; almost all the respondents are responded that the lending procedures of formal credit institutions are not difficult in accessing formal credit.

Ha12: the lending procedure of financial institutions has no significant impact on access to formal credit for small landholder farmers.

xiii. **Interest to credit (deposit) :** is an ordinal variable, deposit interest rate is the amount of money paid to saving households at the time of withdrawals and it is the most important variable in determining access to formal credit (Elsevier B.V., 2019).

Ha13: deposit interest rate has a significant and positive impact on access to formal credit for small landholder farmers.

Summary of explanatory variables

Table 3. 2: Dependent and independent variables of the study

Symbol	Variable represents	Measurement	Source
ACFC	Access to formal credit	Dummy variable coded as 1 if household uses credit 0 if not use	Survey data, 2020
AGE	The households age	Categorical coded as 1if from 15-24 years, 2 if from 25-54 years, 3 if from 55-64 years and finally above 65 years	Muse, (2016)
SEX	Households sex	1 for Male and 0 for Female	KyaloMusembi,(2019)
Education	Highest education Level of households	Categorical variable codded as 1if it is no formal schooling, 2 if it is	Kangogo et al. (2013)

		Primary, 3 if it is Adult education and 4 if it is Secondary level	
Coll	Collateral	Dummy (0 if it is no, 1if it is yes	Chandio et al. (2017)
Farm size	Farmers farm size in hectare	Less than 1 hectare Between 1 and 2 hectares 2 and above	Samuel Semma, (2020)
Saving culture	Saving habit of households	Ordinal (from strongly disagree to strongly agree)	Mekonnen et al. (2017)
Information	Access of information for farmers	Interval (from strongly disagree to strongly agree)	Erasto, (2014)
Livestock ownership	Total animals of households	Continuous	Yehuala, (2008)
Experience in credit use	Farmers credit experience in years	Continuous	Gebeyehu et al. (2019)
Distance from lending institution	Distance in K.M from lenders to borrowers	Interval (from strongly disagree to strongly agree)	Kidane et al. (2018)
Lending procedure	Lending procedure of lenders	Interval (from strongly disagree to strongly agree)	Yehuala, (2008)
Interest rate	The interest rate of lenders	Interval (from strongly disagree to strongly agree)	Elsevier B.V., (2019)

CHAPTER FOUR: DATA PRESENTATION AND ANALYSIS

Introduction

This chapter presents data analysis and discusses the results of the study. This chapter is divided in to two main sections. The first section summarizes the result of descriptive analysis on variables of the study that comes from farmer's using structured questionnaire and direct interview with ACSI officers. The second section presents the result of the binary logistic regression analysis about the determinants of access to formal credit for small landholder farmers**.**

4.1. Descriptive Statistics

4.1.1. Response rate:

396 questionnaires were prepared and distributed to the respondent's i.e. three randomly selected kebeles (Yigoma huletu, Qmbaba and Wogelsa). So, the response rate is computed as total questionnaire returned back divided by the total questionnaire distribute to the respondents multiplied by 100. From the total 396 questionnaire 360 (90%) were filled, this makes the response rate 90% and the remaining 10% were not returned. 360/ 396 × 100 = 90%.

3.1.2. Demographic characteristics

variable	Category	Frequency	Percent	Cumulative percent
Age of HHs	Between 14-24	31	8.6	8.6
	Between 25-54	109	30.3	38.9
	Between 55-64	127	35.3	74.2
	Above 65	93	25.8	100
Sex of HHs	Female	63	17.5	17.7
	Male	297	82.5	100
Education level of HHs	Unable to read and write	112	31.1	31.1
	Adult education	99	27.5	58.6
	Primary education	87	24.2	82.8
	Secondary education	62	17.2	100

Source: research survey, 2021

Age of households: the study indeed, found out that 35.3 percent of those farmers with 55-64 years accessed formal credit as compared to 8.6 percent of 15-24 years of age who accessed credit. About 35.3 percent of those aged 55-64(matured working age) and 25.8 percent of famers aged above 65 years accessed credit. This clearly shows the farmer aged between 25-54 and 55-64years easily accessed credit than those of 15-24years and above 65 years farmers. It seems financial institutions take ages of the farmers as an important parameter in approving credit applications. Similarly, age is considered as a measure of maturity and degree of hard work. Therefore, the middle age farmers are presumed by financial institutions as more responsible and mature, hence a loan they can invest wisely, resulting to prompt repayment. While, on the other hand young farmers are considered less responsible by the financial institutions and as a result have high chances of defaulting loan. Additionally, older farmers of over 65 years considered an elder age. Therefore, financial institutions are considering in this age group the persons health condition, ability to repay his loan and others.so, the existing financial institutions in the study area tend to approve most of the loans from farmers aged 25-54 years and 55-64 years than for the others as shown in figure 1. When analyzing the age relationship with access to credit as displayed in table 4.2.1, those

households in the bracket from 55 to 64 year were found to be more credit accessed (59.3) than the other age brackets. However, in this cross-tabulation most farmers does not receive credit, this indicated that age is not considered as a determinants of access to formal credit in study area.

Sex of households: The sex of farmers involved in the study comprised mainly the male compared to their female counterparts as summarized in figure 2. Sex was included because males are known to have greater access to formal credit than female in most financial institutions. Male farmer accessed credit than their female counterparts at 82.5 percent and 17.5 percent respectively. This shows that most of the decisions on accessing formal credit mainly made by credit in the two formal credit institutions. The implication is that male-headed households had more access to formal credit than their female counterparts could be because male dominates land ownership. This is attributed to collateral security which is a requirement by financial institutions is traditionally owned by male farmers. Indeed, this make the sex variable an important determinant in accessing formal credit, where the female-headed households are credit constrained.

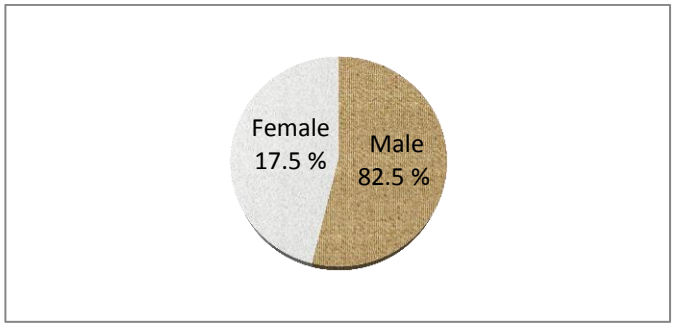
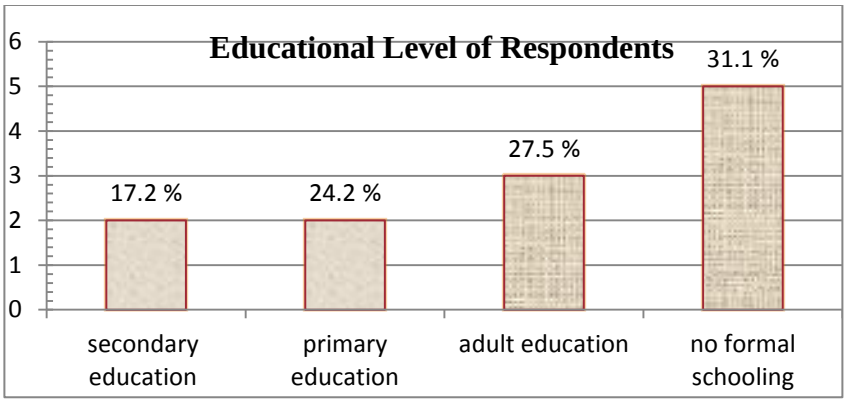


Figure 3: Sex of respondent
Source: research survey, 2021

Education level of respondents: Higher level of education imply better technical knowledge, know-how and farming skills, more information on credit accessed with bureaucratic procedures. However, about 31.1 percent of household heads never attended any formal schooling, 27.5 percent of households attend adult education, while, it 24.2 percent of the households are attended primary school and the remaining 17.2 percent of households are went to secondary school.

Figure 4: Education level of households



Source: research survey, 2021

4.1.3. Socio- economic characteristics

Collateral

Table 4.4: descriptive analysis of collateral

	Frequency	Percent	Cumulative percent
No	166	46.1	46.1
Yes	194	53.9	100

Source: research survey, 2021

The result of survey indicated that 53.9 % of the respondents have different types of assets that are used as collateral such as land, house, vehicle, agricultural equipment and furniture. But 46.1 % of the respondents have not different types of assets used as collateral.

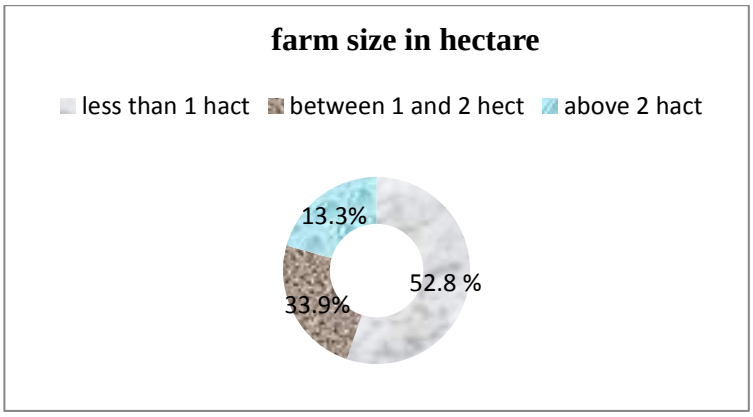
Farm size

Table 4.4: descriptive analysis of farm size in hectare

variable	Category	Frequency	Percent	Cumulative percent
Farm size hectare	Less than one hectare	190	52.8	52.8
	Between one and two hectare	122	33.9	86.7
	Above two hectare	87	24.2	100

Source: research survey, 2021

Figure 6: farm size in hectare



Source: research survey, 2021

Regarding farm size in hectare, in the sample, 190 (52.8 %) households have farm size that falls below 1 hectare and only 48 (13.3 %) household indicates their farm is above 2 hectare the remaining 33.9 % households have between 1 hectare and 2-hectare farm size. This shows that, large number of households cultivate agricultural products on small farm size

Saving culture

Table 4.5: descriptive analysis of saving culture

variable	Category	Frequency	Percent	Cumulative percent
Saving culture	Strongly disagree	121	33.6	33.6
	disagree	99	27.5	61.1
	Neutral	24	6.7	67.8
	Agree	42	11.7	79.4
	Strongly agree	74	20.6	100

Source: research survey, 2021

The descriptive analysis indicated that 121 (33.6 %) small landholder farmers strongly disagree on saving culture of households. 99(27.5 %) farmers disagree on saving culture of households in formal credit institutions. 24(6.7 %) of households are neutral on saving culture. 42(11.7%) small landholder farmers agree on saving culture of households from formal credit institutions and finally 74(20.6 %) of respondents are strongly agree on saving culture of farmers. This outcome indicated that majority of small landholder farmers are not save their money in formal credit institutions or they are not interest to save their money from formal credit institutions.

Source of information

Table 4.6: descriptive analysis of source of information

variable	Category	Frequency	Percent	Cumulative percent
source of information	Strongly disagree	5	1.4	1.4
	disagree	26	7.2	8.6
	Neutral	30	8.3	16.9
	Agree	246	68.3	85.3
	Strongly agree	53	14.7	100

Source: research survey, 2021

The descriptive analysis in the above table indicated that 5(1.4%) of respondents strongly disagree on source of information. 26(7.2 5) of respondents disagree on source of information. 30(8.3 5) of the respondents neutral on the source of information. 246(68.3 5) of respondents agree on the source of information and finally 53(14.7 5) of the respondents strongly disagree on source of information. This outcome indicated that small landholder farmers in Bahir Dar zuria woreda agree and strongly agree on source of information. This means that they are information accessed about formal credit institutions. Additionally, source of information is one of the major determinants in accessing formal credit from formal credit institutions.

TLU

Table 4.7: descriptive analysis of TLU

	N	Minimum	Maximum	Mean	Std. Deviation
Total number of animals in TLU	360	0	52	13.00	9.562
Valid N (list wise)	360				

Source: research survey, 2021

Number of livestock in tropical livestock unit in rural areas takes as an accumulation of wealth, security during emergency case. They can also exchange into cash when the demand rises. Livestock is the most important asset for the rural households in the study area. Based on storck et al. (1991) livestock population number was converted in to tropical livestock unit (TLU). The mean livestock holding of the respondent farm households was 13 TLU. The minimum number of livestock maintained was none (0) and the maximum was 52 TLU.

Experience in credit use

Experience in credit use from formal credit institutions is different among the sample households. The average years of credit experience of sample households from the formal financial institutions in the study area were 2.173 years and the maximum and minimum experience were 10 years and 0 year respectively

Table 4.8: descriptive analysis of experience in credit use

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
how long you used credit service from formal credit institutions	360	0	10	1.71	2.173
Valid N (list wise)	360				

Source: research survey, 2021

Distance from lending institutions

Table 4.9: descriptive analysis of distance from lending institution

variable	Category	Frequency	Percent	Cumulative percent
Distance from lending institution	Strongly disagree	18	5	5
	disagree	31	8.6	13.6
	Neutral	3	8	14.4
	Agree	140	38.9	53.3
	Strongly agree	168	46.7	100

Source: research survey, 2021

As we have seen in table 4.9 above 18(5 %) of the respondents strongly disagree on distance from lending institutions. 31(8.6 %) of the respondents disagree on distance from lending procedure. Only 3(8 %) of the respondents neutral on distance from lending institution. 140(38.9%) of the respondents are agree on distance from lending institutions and the remaining 168(46.7%) of the respondents are strongly agree on distance from lending institutions. The result showed that majority of households says that there is a difficulty with related to distance. To get the credit access from formal credit institutions small landholder farmers need to be goes long distance in kilometers. However, Access to formal credit is not influenced by distance.

Infrastructure

Table 4.10 descriptive analysis of infrastructure

Variable	Category	Frequency	Percent	Cumulative percent
Infrastructure	Strongly disagree	66	18.3	18.3
	disagree	164	45.6	63.9
	Neutral	24	6.7	70.6
	Agree	67	18.6	89.2
	Strongly agree	39	10.8	100

Source: research survey, 2021

In the above table 4.10 the descriptive analysis indicated that 66(18.3 %) farmers strongly disagree on access rural road in their kebeles. 164(45.6 %) respondents disagree on infrastructure. 24(6.7 %) farmers neutral on access of rural road. 67(18.6 %) respondents agree on access of rural road and the remaining 39(10.8 %) of respondents strongly agree on access of rural road. The result shows that majority of the respondents said that there is no full infrastructure in their kebeles. But, in accessing formal credit infrastructure is not considerd as the main factor.

4.1.4. Institutional characteristics

Lending procedure

Table 4.11 descriptive analysis of lending procedure

Variable	Category	Frequency	Percent	Cumulative percent
Lending procedure	Strongly disagree	1	3	3
	Disagree	10	2.8	3.1
	Agree	15	4.2	7.2
	Strongly agree	334	92.8	100

Source: research survey, 2021

The result of the model indicated that 1 (3%) respondents strongly disagree on the lending procedure. 10(2.8 %) of the respondents disagree on lending procedure of lenders. 15(4.2 %) farmers agree on lending procedure and finally 334 (92.8%) of respondents strongly agree on the lending procedure. The output of the model indicated that the majority of households responded that the lending procedure of institutions were very complicated. However, it does

not affect access to formal credit in study area. From the total respondents some respondents are responded that the lending procedures of formal credit institutions are not difficult to get the credit access from formal institutions in the study area.

Deposit interest rate

Table 4.12 descriptive analysis of interest rate

Variable	Category	Frequency	Percent	Cumulative percent
Interest rate	Strongly disagree	151	41.9	41.9
	disagree	84	23.3	65.3
	Neutral	16	4.4	69.7
	Agree	85	23.6	93.3
	Strongly agree	23	6.7	100

Source: research survey, 2021

The above table 4.12 indicated that 151 (41.9 %) the respondents strongly disagree on deposit interest rate. 84 (23.2 %) of households disagree on deposit interest rate. 16(4.4 %) of the respondents were neutral. From the total respondent 85 (23.6 %) of farmers responded that they are agree on deposit interest rate. The remaining 23 (6.7 %) of the respondents are strongly agree on deposit interest rate. The result of the model indicated that majority of households were a doubt on the deposit interest rate which mean that formal credit institutions are not paid sufficient interest rate on their deposit. As a result of this small landholder farmers were not save their money in formal credit institutions. In the opposite side some respondents said that deposit interest rate is sufficient. Generally, access to formal credit is influenced by deposit interest rate.

4.1.5. Cross- tabulation between the predictor variables and response variable

Age of households

Table 4. 1: Age of respondents and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
age of households	Between 15-24	16.5	14.5	31.0
	Between 25-54	58.1	50.9	109.0
	Between 55-64	67.7	59.3	127.0
	Above 65	49.6	43.4	93.0
Total		192.0	168.0	360.0

When analyzing the age relationship with access to credit as displayed in table 4.2.1, those households in the bracket from 55 to 64 year were found to be more credit accessed (59.3) than the other age brackets. However, in this cross-tabulation most farmers does not receive credit, this indicated that age is not considered as a determinants of access to formal credit in study area.

Sex of respondents

Table 4. 2: Sex of respondents and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
Sex of households	Female	33.6	29.4	63.0
	Male	158.4	138.6	297.0
Total		192.0	168.0	360.0

Sex access credit (see table 4.2.2) shows that male households were slightly more credit accessed than female households (138.6 male Vs 29.4 female) when compared to the average (168).

Education level of households

Table 4. 3: Education level of households and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
Education level of households	Unable to read and write	59.7	52.3	112.0
	Adult education	52.8	46.2	99.0
	Primary education	46.4	40.6	87.0
	Secondary education	33.1	28.9	62.0
Total		192.0	168.0	360.0

The level of access to credit education wise as displayed in table 4.2.3 shows that most of small landholder farmers were not credit accessed. That means education does not considered as the determinant of access to formal credit. However, majority farmers of Bahir Dar Zuria Woreda were literate.

Collateral

Table 4. 4: collateral and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
do you have assets (land, house, vehicle, agricultural equipment and furniture and fixtures) as collateral	No	88.5	77.5	166.0
	Yes	103.5	90.5	194.0
Total		192.0	168.0	360.0

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	216.741[a]	1	.000
Likelihood Ratio	253.255	1	.000
Linear-by-Linear Association	216.138	1	.000
N of Valid Cases	360		.000

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 77.47.

The above table shows that the predictor variable and the response variable as they have statistically significant association at (P-value < 0.05). Majority of households have not credit accessed because of their inability of collateral in their house.

Farm size

Table 4. 5: Farm size and access formal to credit

		Access to credit		
		Without credit access	With credit access	Total
What is your farm size in hectare?	less than 1 hectare	101.3	88.7	190.0
	between 1 and 2 hectare	65.1	56.9	122.0
	above 2 hectare	25.6	22.4	48.0
Total		192.0	168.0	360.0

The association of farm size and credit access shows that most of the household have less than 1 hectare. That means access to credit is impossible without land. Because of smallest farm size, farmers were without credit accessed in the study area.

Saving culture

Table 4. 6: Saving culture and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
Household savers in the formal credit institutions have the ability repay their loan than non-savers	strongly disagree	18.1	15.9	34.0
	disagree	15.5	13.5	29.0
	neutral	4.8	4.2	9.0
	agree	33.6	29.4	63.0
	strongly agree	120.0	105.0	225.0
Total		192.0	168.0	360.0

Source: research survey, 2020

Table 4. 7: chi-square test of saving and access to credit

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	53.802[a]	4	
Likelihood Ratio	62.827	4	.000
Linear-by-Linear Association	31.087	1	.000 .000
N of Valid Cases	360		

a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is 4.20.

The association between saving culture and access to formal credit shows that as they have seen in table 4.3.4 there is statistically significant association (at P=<0.05). If farmers are save their money in formal credit institutions, they have get credit accessed and they have an ability to pay their loan on time.

Source of information

Table 4. 8: Information and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
I can get the information from radio, phone, internet, extension agents and from other farmers	strongly disagree	2.7	2.3	5.0
	disagree	13.9	12.1	26.0
	neutral	16.0	14.0	30.0
	agree	131.2	114.8	246.0
	strongly agree	28.3	24.7	53.0
Total		192.0	168.0	360.0

Source: research survey, 2021

Table 4.10 shows the association between information sources and access to formal credit. Majority of farmers were not information accessed this indicated that information is an important variable in determining access to formal credit.

Tropical livestock unit

Table 4. 9: TLU and access to formal credit

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Total number of animals in TLU	360	0	52	13.00	9.562
Valid N (list wise)	360				

Source: research survey, 2021

Livestock is statistically significant with negative relationship with access to formal credit at (p= <0.05). Livestock is the most important asset for the rural households in the study area.

Based on strock et al. (1991) livestock population number was converted in to tropical livestock unit (TLU). The mean livestock holding of the respondent farm households was 13 TLU. The minimum number of livestock maintained was none (0) and the maximum was 52 TLU.

Experience in credit use

Table 4. 10: Experience in credit use

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
how long you used credit service from formal credit institutions	360	0	10	1.71	2.173
Valid N (list wise)	360				

Source: research survey, 2021

Experience in credit use from the formal credit institutions is different among the sample households. The number of sample households who had experience with using credit from formal financial institutions was only 12.5 percent. The average years of credit experience of sample households from the formal financial institutions in the study area were 2.173 years and the maximum and minimum experience were 10 years and 0 year respectively.

Distance from lending institutions

Table 4. 11: Distance and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
do you agree that the lending institutions are very far from your home	strongly disagree	9.6	8.4	18.0
	disagree	16.5	14.5	31.0
	neutral	1.6	1.4	3.0
	agree	74.7	65.3	140.0
	strongly agree	89.6	78.4	168.0
Total		192.0	168.0	360.0

Source: research survey, 2021

The distance in hours that the potential beneficiaries traveled on foot for accessing credit from formal financial institutions was assessed. The majority of household's response shows that

the distance is far from their home. It is considered as the variable that affects households from accessing credit service.

Infrastructure

Table 4. 12: Infrastructure and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
at how much degree you are agree that there is rural road that connects your kebele with woreda	strongly disagree	35.2	30.8	66.0
	disagree	87.5	76.5	164.0
	neutral	12.8	11.2	24.0
	agree	35.7	31.3	67.0
	strongly agree	20.8	18.2	39.0
Total		192.0	168.0	360.0

Source: research survey, 2021

Majority of households responded that there is no full infrastructure in study area; as a result, households have not a credit access as shown in table 4.3.6 (without access 168 Vs with access 168). However, infrastructure is not considered as the determinants of access to formal credit. That mean whether there infrastructure or not it is the not the major factor. Access to formal credit is not determined by infrastructure in the study area.

Lending procedure

Table 4. 13: Lending procedure and access to forma credit

		Access to credit		
		Without credit access	With credit access	Total
Formal credit institutions have convenience working time of repayment for their clients	strongly disagree	9.6	8.4	18.0
	disagree	44.3	38.7	83.0
	neutral	4.8	4.2	9.0
	agree	48.0	42.0	90.0
	strongly agree	85.3	74.7	160.0
Total		192.0	168.0	360.0

Source: research survey, 2021

From the total respondents some respondents are responded that the lending procedures of formal credit institutions are not difficult to get the credit access from formal institutions in the study area.

Interest rate

Table 4. 14: Interest rate and access to formal credit

		Access to credit		
		Without credit access	With credit access	Total
Sufficient interest rate is paid for depositors	strongly disagree	80.5	70.5	151.0
	disagree	44.8	39.2	84.0
	neutral	8.5	7.5	16.0
	agree	45.3	39.7	85.0
	strongly agree	12.8	11.2	24.0
Total		192.0	168.0	360.0

Table 4. 15: Chi-square test of interest rate and access to credit

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	99.984[a]	4	.000
Likelihood Ratio	107.730	4	.000
Linear-by-Linear Association	87.794	1	.000
N of Valid Cases	360		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.47.

The above table 4.3.8 shows that the predictor variable and the response variable as they have statistically significant association at (P-value < 0.05).

4.2.Binary logistic regression

4.2.1. Model assumptions and data properties

The following diagnostic tests were carried out to insure that the data fit and the basic assumptions of Binary Logistic Regression Methods are presented or cheeked. Logistic regression does not assume a linear relationship between the dependent and independent

variables. The dependent variable must be a dichotomy (2 categories). The independent variables need not be interval, nor normally distributed, nor linearly related, nor of equal variance within each group. The categories (groups) must be mutually exclusive and exhaustive; a case can only be in one group and every case must be a member of one of the groups. Larger samples are needed than for linear regression because maximum likelihood coefficients are large sample estimates. 30 cases per predictor are fair and recommended (Sabine & Brian, 2004).

Regarding the dependent variable, as expressed previously, it is a dichotomous variable with two categories. In addition, it is coded as two categories that are helpful to fit with binary logistic regression method. The study takes access to formal finance as a dependent variable with dummy if the response is yes as 1, 0 otherwise. Therefore, it fulfills the first assumption.

Case Processing Summary: is a summary, which shows the total number of cases observed, missing cases and cases included in analysis (Julie, 2007). Case processing summary is presented in the following table, Table 4.3.9.

Table 4. 16: Case-processing summary

Unweighted Cases		N	Percent
Selected Cases	Included in Analysis	360	100.0
	Missing Cases	0	0
	Total	360	360
Unselected Cases		0	.0
Total		360	100.0

a. If weight is in effect, see classification table for the total number of cases.

Source: Binary logistic regression output

The case-processing summary in Table 4.3.9 shows that a total number of cases observed are 360 and of which 360 included in analysis and there is no cases selected as missing cases. When running binary logistic regression model, if there is missing in a given case in one of the explaining variables or predicted variable then it will be excluded from the overall analysis (Julie, 2007).

Omnibus test of model coefficient:

Gives an overall indication of how well the model performs, over and above the result obtained for Block 0, with none of the predictor enters in to the model. This referred as a 'goodness of fit' test. For this set of result, a highly significant value is necessary (significant value less than 0.05) (Julie, 2007). It presented in the following table, Table 4.310.

Table 4. 17: Omnibus tests of model coefficient

		Chi-square	df	Sig.
Step 1	Step	387.096	13	.000
	Block	387.096	13	.000
	Model	387.096	13	.000

Source: binary logistic regression output

Table 4.3.10 shows that a significant effect of access to finance (LR test: chi square= 387, $p < 0.001$).Therefore, the model with the set of variables used as predictors is better than SPSS, original guess shown in the block0, which assumed that everyone would report no access to formal finance.

Hosmer and Lemeshow Goodness of Fit Test: is the most reliable test of model fit available in SPSS and interpreted very differently from the omnibus test. Here poor fit is indicated by a significant value less than 0.05. Therefore, to support a model the value must be greater than 0.05 (Julie, 2007).

Table 4. 18: Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.885	8	.770

Source: Binary logistic regression output

As presented on Table 4.20 the chi-square value for the Hosmer-Lemeshaw Test is 4.885 with a significant level of 0.77. This value is larger than 0.05, therefore indicating support for the model.

Model summary: gives us another piece of information about the usefulness of the model. The Cox and Snell R square and the Negelkerke R square values provide an indication of the amount of variation in the dependent variable explained by the model (from a minimum value of zero to a maximum of approximately 1) (Julie, 2007)

Table 4. 19: Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	110.369[a]	.659	.880

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Source: Binary logistic regression output

From Table 4.3.12, the two values of Cox and Snell R square and the Negelkerke R square are 0.659 and 0.880, suggesting that between 65.6 percent and 88 percent of the variability is explained by the set of variables.

Classification table: provides with an indication of how well the model is able to predict the correct category for each case. There are two predictive values called positive and negative. Positive predictive value is the percentage of cases that are the model classified as having the characteristics that is actually observed in the group. Negative predictive value is the percentage of cases predicted by the model not to have the characteristics that is actually observed not to have the characteristics (Julie, 2007).

Table 4. 20: Classification table

		Predicted		
		Are you credit accessed or without credit accessed?		
Observed		Without credit access	With credit access	Percentage Correct
Are you credit accessed or without credit accessed?	Without credit access	182	10	94.8
	With credit access	6	162	96.4
Overall Percentage				95.6

Source: Binary logistic regression output

As presented in Table 4.22, classification table shows misses in classification accuracy, which shows correctly classified and incorrectly classified. There are 192 individuals classified in the model as without access of which 97.2 percent are misclassified as false negative and the remaining 94.8 percent are correctly classified. Similarly from the total 168 individuals

classified in the model as there is with credit access for loan 96.4 percent are correctly classified while remaining 71.6 percent are classified as false positive indicating misclassified by the model as there is credit access while actually there is no. Therefore, the overall accuracy of the model is 95.6 percent implying the model can correctly predict the predicted variables, access to formal credit.

Multicollinearity diagnosis:

To study determinants of access to formal credit for small landholder farmers, 360 farmers were subjected to logistic regression analysis. The statistical software used for analyzing the data was SPSS 23.0 for windows. There are two measures are often suggested to test the presence of multicollinearity. These are, variance inflation factor (VIF) for association among the continuous explanatory variables and contingency coefficients for dummy variables Guajarati (2003).

Table 4. 21: Contingency coefficients for explanatory variables

	AGE	SEX	EDULVL	COLLAT~L	FRMS	SAVING	INFORM	LIVEST~K	CREDIT~P	DISTNT	INFRAS	LENPROCR	INTERSTR
AGE	1.0000												
SEX	-0.0546	1.0000											
EDULVL	0.1197	-0.0239	1.0000										
COLLATERAL	0.1239	-0.0887	0.1062	1.0000									
FRMS	-0.0368	0.1048	0.0564	0.1233	1.0000								
SAVING	-0.1013	-0.0899	0.1385	0.1179	0.0395	1.0000							
INFORM	0.0370	0.0104	0.2537	0.0613	0.0519	0.1286	1.0000						
LIVESTOCK	-0.1057	0.0568	-0.0613	-0.4347	-0.1588	-0.0635	-0.0659	1.0000					
CREDITEXP	0.1272	-0.1226	0.1496	0.7203	0.1330	0.1545	0.0385	-0.3603	1.0000				
DISTNT	0.0304	-0.0315	-0.0177	0.0059	-0.0139	0.0547	-0.0723	0.0235	0.0231	1.0000			
INFRAS	-0.0177	-0.0323	-0.0082	-0.0404	0.0519	0.0451	0.0308	0.0516	0.0241	-0.0096	1.0000		
LENPROCR	-0.0023	-0.0180	0.1293	0.0730	-0.0111	0.0782	0.1155	-0.0370	0.0647	-0.0969	0.0882	1.0000	
INTERSTR	0.2025	-0.0288	0.1232	0.3647	0.0808	-0.0711	0.0471	-0.2593	0.4382	0.0311	0.1028	-0.0407	1.0000

Contingency coefficient was computed to check the existence of multicollinearity problem among explanatory variables. The decision rule is, when its value approaches to 1, there is a problem of association between variables. The negative sign shows the negative relationship between variables that is an increase in one variable will cause a decrease in the other variable. From this, the highest correlation coefficient was 0.72.

4.3.Binary Logistic Regression Result

In this subtopic the study, investigate the level of relationship and magnitude of explanatory variables over predicted variable based on the logistic regression model output. Therefore, finally the finding determines which of the explanatory variable are predictive of access to formal credit. Here the data analyzed is "variable in the equation table" from output of the regression. The variable in the equation table gives information about the contribution or importance of each of a models predictor variable. The test that is used here is known as the Wald test, and the value of the statistics for each predictor in the column labeled Wald. Columns are the variables that contribute significantly to the predictive ability of the model (Julie, 2007). The variable in the equation table is presented below.

Table 4. 22: Variables in the equation table

Variables In The Equation	B	S.E.	Wald statistics	Sig.
AGE	.202	.341	.362	.547
SEX	-.247	.723	.117	.732
EDULVL	-.036	.264	.019	.890
COLLATERAL	3.421	.617	30.702	.000
FRMS	-.005	.391	.000	.989
SAVING	.770	.239	10.407	.001
INFORM	.672	.359	3.509	.061
LIVESTOCK	-.059	.031	3.496	.062
CREDITEXP	.920	.168	29.954	.000
DISTNT	-.010	.248	.002	.968
INFRAS	-.257	.212	1.469	.226
LENPROCR	.126	.210	.360	.548
INTERSTR	.755	.221	11.661	.001
Constant	-10.738	2.838	14.316	.000

a. Variable(s) entered on step 1: AGE, SEX, EDULVL, COLLATERAL, FRMS, SAVING, INFORM, LIVESTOCK, CREDITEXP, DISTNT, INFRAS, LENPROCR, INTERSTR.

Source: binary logistic regression output

Interpretation of Explanatory Variables

Age of households:

In this study, ages of the household head were treated as a categorical variable. It was found that; age of the household head does not significantly predict access to formal credit. This shows being younger or older household head does not matter for access to formal credit in study area. This finding disputed the finding of Chinasa & Kelechi (2015) says that the age of farmers is negatively and significantly associated with probability of accessing credit and the result shows that an increase in household age by one year leads to decrease in the probability of farmer's access to credit. It might be due to the fact that older farmers have larger capital basis not to see for credit. The result is consistent with the result of Muse (2016) and Assogba et al., (2017) who found that age of households head does not significantly predict access to formal financial services.

The Present results are suitable in that, household heads earlier with uses of formal credit determine the value of being old age to apply formal credit. Experiences of household heads developed though time that makes him/her customer of financial institutions in specific formal financial institutions and not the fact that he/she is old in age naturally in the sociopolitical context of the country.

Sex of Respondents

The variable is a Dummy variable and a value of 0 assigned for female and 1 for male. The study also uncovered that sex of the household head is insignificant in determining household's access to formal credit. This is an indicator of improvements in gender discrimination. It may result from because of special treatment given by the millennium development goals and the progressing of microfinance moments in Ethiopia that are part of weapons for women empowerment. However, still the male dummy has an insignificant negative coefficient, which shows that the negligible benefit of male-headed households in reducing the probability of being credit constrained. This result is consistent with results of Tilahun (2015) who found that genders of household heads are insignificant with negative

coefficients. This finding disputed with the finding of (Kaino, 2005) and that of (Sebopetji & Belete, 2009).

Education level of households

Education levels of households were treated as a categorical variable. In the study as shown in the model of the above table 4.3, education level of households become insignificant to predict household's level of access to formal credit. However, this finding contradicts with the hypothesis of the researcher that has claimed positive effect of household's education for access to formal credit. Moreover, Muse (2016), argues that whether households educated or not it does not matter in determining access to formal credit.

Generally, this study reveals that education has an insignificant influence on access to formal credit. This finding disputed with the finding of Dzadze et al. (2012) level of education influences a farmer's chances of accessing credit. This is because higher level of education is associated with the ability to access and comprehend information on credit terms and conditions, and ability to complete loan application forms properly.

Collateral

The study found that collateral has positive and statistically significant influence on access to formal credit of p (0.000) at 1 % of probability level. The coefficient of estimation result shows that if a borrower has collateral, small landholders can access formal credit service. Because, small landholder farmers have ability to repay their loan on time, if borrowers are fail to repay their loan there is an assurance to lenders. The finding of this study is consistent with the finding of (Assogba et al, 2017; (Samuel, 2020). Collateral means farm households are expected to have social collateral, which is practiced in group borrowing as well as individual borrowing methods as a requirement to access credit in microfinance institutions and commercial banks.

Farm size in hectare

Farm sizes of households in this study can understood as the total cultivated land size under the control of particular households measured in terms of hectare. According to the model output, farm size was insignificant relationship with access to formal credit by small

landholder farmers. This variable is associated with the age of households. The older the small landholder farmer becomes, the more experience gained the credit access.

Saving culture

As expected, the saving variable was positive and statistically significance influence with access to formal credit. The higher the households saving, the more the household savers to repay their loan and the more likely that credit institutions lend to those savers. The output of the model shows that saving is significance (P=0.000) at 1% probability level in the study area. The output indicated that the small landholder farmers saving culture were highly important and is a precondition for credit access and farmers are able to repay their loan on time in study area. The output indicated that the probability of access to formal credit is increased by farmers saving habit with related to their ability to repay their loan. The result of the study is consistent with the result of Baiyegunhi et al. (2014) and Samuel (2020). When farmers save higher amount of money it leads to an increase the ability to repay their credit to financial institutions it could be substituted as collateral in providing credit.

Information

The model output stated that access of information (INFORM) has positively and significantly determined the households access to formal credit at 10% probability level. The finding shows that the small landholder farmer who got information about lending institutions from different sources are more likely access the credit possibility than those who do not got. These is because informed households are knows more about credit requirements, rules and regulations of credit access. The result of the study indicated if, small landholder farmers have strong culture of using available source of information like radio wave and Televisions as a source of information on the socio political conditions of his/her locality and nationwide, their likelihood to use formal credit increases more due to the effects of media teaching. The result is disputed with (Muse, 2016).

Livestock ownership

The result of binary logit model shows that total livestock ownership owned by farmers in the form of tropical livestock unit (TLU) found to have a negative and statistically significant at (10%) relationship with access to formal credit. A unit increases in total livestock

decreases the probability of farmer's access to formal credit. Because, livestock is an asset of farmers that can liquidate at the time of cropping season to purchase agricultural inputs thereby reducing their need of credit. In addition, Number of livestock in tropical livestock unit in rural areas takes as an accumulation of wealth, security during emergency case. They can also exchange into cash when the demand rises. As a result, it hypothesized that a negative relationship with the dependent variable by justifying, when the total number of animals of household increases, the household would be less likely to go for credit. The result of the model also shows that the variable has a negative relationship that farmer with lesser number of animals uses formal credit service than larger animals. The result is consistent with the result of (Gebeyehu et al., 2019) and that of (Sisay, 2008).

Experience in credit use

This variable has positive and statistically significant to determine household's access to formal credit at 1 % significance level. This indicates that the more experienced the households in credit use, the better to get access to formal credit in the study area. The farmers who had relatively long-term relationships with credit institutions were more likely to access such credit easily with compared to relatively new farmers. In case of access to credit from formal sources, farming experience also plays a crucial role because the experienced farmers would have already dealt with banks to access loans several times in the past, so they had a better understanding of the terms, conditions and procedure; hence, the cost incurred on the credit would remain low. This result is consistent with the result of Nouman, Siddiqi, Asim, and Hussain (2013), Oboh and Ekpebu (2011), saqib et al. (2018), and Sebopetji and Belete (2009) who all reported a positive relationship between access to agricultural credit and farming experience. Similarly, Yehuala (2008) also revealed that farmers with greater farming experience had a much better association with cooperatives and other formal sources of credit like formal banks and non-governmental organizations. Based on the output of the model most of the respondents had 1 year to 5 years.

Distance

The distance to credit source is insignificant impact on access to formal credit. Access to formal credit is not determined by its distance rather it determined by household collateral and number of households livestock in the study area. The result of the this study is different from

the result of Kiplimo et al. (2015) who found that farmers tend to discouraged borrow from formal credit institutions when credit sources are located further away from their farming operations. Additionally, Johnson and Morduch (2007) shows that those farming households who lives nearer to the credit source have positive effect on credit access.

Infrastructure

Access to infrastructure among households living in Bahir Dar Zuria Woreda does not bring significant effect on access to formal credit. The result of current study implies that, access to infrastructure is important for the safe transport of households from their kebele to their market center of the woreda. Otherwise, access to infrastructure does not determine household level usage of formal credit services. So, access of infrastructure can used as for the fulfillments of financial request from formal credit institutions located in town area and do not directly determine access to formal credit in the study area.

Lending procedure

Lending procedures is among the independent variables tested as a determinant of smallholder farmers' access to credit. To get credit from formal credit institutions, farmers are expected to pass different steps. From those steps, some are applying for credit, recruited by peasant association screening, committee and finally group formation. However, based on the result of the model from the total respondents most of them are responded that the lending procedure is not difficult and was not a constraint to access credit. That means formal credit institutions have convenience time for their clients

Interest rate

Interest rate is an amount of money paid to depositors at the time of withdrawal from formal credit institutions. The relationship between deposit interest rate and access to formal credit for farmers from formal credit institutions conforms to a prior expectation of the study. That is, the higher deposit interest rate by financial institutions, the higher the volume of credit source by farmers and vice versa. The output of the model shows that deposit interest rate is statistically significant and positive signs with access to formal credit at ($P=<0.05$). The reason is that, when deposit interest rate increases to farmers saving culture of farmers also increased this leads an increase the probability of access to formal credit.

Constraints of Small Landholder Farmer's Uses of Credit Access from Microfinance Institution and Commercial Banks

- Concerning with the question to household about why you do not use credit access from commercial bank of Ethiopia majority of sampled farmers indicates there is the problem of collateral needed by commercial bank for credit security. Some of the respondents responded that lack of information about formal credit institutions. In reality, most of small landholder farmers lack of required collateral of commercial bank of Ethiopia.
- During the time of interview with the manager of microfinance institution weak institutional saving mobilizations, absence of agents lower in the kebeles Level and lack of combination with local governmental administrative is the major problems of household level uses of saving products study area.

REQUIREMENTS OF AMHARA CREDIT AND SAVING INSTITUTIONS FROM FARMERS

- ✓ Access to formal credit for small landholder farmers is easy to implement in Amhara credit and saving institution using land as collateral like vegetable farm.
- ✓ Small landholder farmers are borrowed from Amhara credit and saving institution up to 50,000 in birr.

The main requirements are;

- First of all farmers must open an account book from Amhara credit and saving institutions.
- Identification card from their kebeles
- If farmers are married, it needs the agreements of both husband and his wife.
- Perception of farmers like repaid their loan or not and farmers strength and weakness should be checked.
- Farmers should purchase life insurance

However, now a day's access to formal credit is weak as a result of different factors. To improve access to formal credit;

- ✓ there should be peace in the countries;

- ✓ There should be market stability because farmers are borrowed at the time of summer season so, to get credit and to pay credit back market stability is the most important factor.

Requirements of Commercial Bank of Ethiopia

- ➢ The applicant shall present landholding certificates and current year land rent payment receipt;
- ➢ The applicant shall have a minimum of 2 hectares of land but more than 29 hectare;

If the applicant is cooperative, association or union, it shall present:

- ➢ Registration certificate from regional or national cooperative agency;
- ➢ Minutes of resolution on the financing requested passed by at least three-fourths of attendees of the general assembly or as per memorandum and/or articles of association;
- ➢ If the financing request is for purchase of tractor, combine harvesters or other heavy agricultural machineries, the applicant shall submit confirmation letter from woreda or zone or region or ministry of agriculture which assures suitability of the area for merchandiation.
- ➢ The applicant shall have present a business plan which shows financial viability and repayment capacity of the business;
- ➢ The applicant shall make equity contribution of at least 30% of the purchase value of the agricultural machinery solely in cash.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

Introduction

This chapter precisely presented the findings of the study and main recommendations of the researcher for concerned bodies.

5.1.Conclusion

In this section the researcher was concluded based on objective of the study

Result of the study indicated that 53 % of small landholder farmers in the review woreda did not have access to formal credit. This shows that small landholder farmers in the study area may not be adequately financed or do not have adequate collateral given the low level of credit access.

The first objective of this study focuses on identifying the demographic characteristics of farmers like age, sex and education has no significant influence on access to formal credit. This is as a result of access to formal credit is determined by households experience in credit use.

Socio-economic factors like collateral, farm size in hectare, saving culture, source of information, livestock ownership, experience in credit use, distance from lending institution and infrastructure are variables which were presumed to have an impact on access to formal credit. The binary logit estimate indicated that collateral, saving culture, source of information and experience in credit use significantly influence access to formal credit in study area. Livestock ownership in terms of tropical livestock unit has negative influence on access to formal credit.

From institutional characteristics of lenders deposit interest rate have significant positive impact on access to formal credit? However, lending procedure has no influence on access to formal credit.

To achieve this objective, thirteen hypotheses were developed. To test hypothesis and to achieve the intended research objective, the study applied qualitative and quantitative research approach and explanatory research design. The analysis was performed using cross-sectional data derived from small landholder farmer’s interview in Bahir Dar zuria woreda.

The sample of this study was included 360 credit users and non- user small landholder farmers in Bahir Dar District. Multi-stage sampling technique was used to select three hundred sixty small landholder farmers in study area from the total population. Diagnosis tests, descriptive statistics, contingency coefficient and regression analysis were employed for this study. Access to formal credit considered as dependent variable that was measured credit user and non-user of farmers. While, age, sex, education, collateral, farm size, saving, information, livestock, experience in credit use, distance, infrastructure, lending procedure and deposit interest rate were taken as independent variable. Binary logistic regression model was applied to estimate the parameters of model.

The result of study showed that six explanatory variables found to be significant at 10 % and <0.05 % level of significance.

Among thirteen explanatory variables, livestock has negative and statistically significant effect on access to formal credit at 10 % significance level. While, collateral, saving culture, source of information, experience in credit use and interest deposit interest rate has positive and statistically significant effect on access to formal credit at 10% and <5 % significance.

5.2. Recommendation

In Bahir Dar District, access to formal credit for farmers was the major concern related to higher expansion of agriculture and reduction of poverty. The analysis of the study indicated that access to formal credit has positive impact on farmer's living standards. Based on the finding of the study the researcher provided the following recommendations.

For Microfinance Institutions (MFIs)

- MFIs should find a method of source of information for farmers

For commercial bank of Ethiopia

- CBE should open branches in rural area and promote farmers to save their money in banks by increasing deposit interest rate.
- By counting of farmers wealth CBE facilitate credit service for farmers
- CBE now just focus on big customers rather than agricultural-sector customers, so commercial banks have widely reach out to small landholder farmers with their benefits from farming activity.
- CBE should consider farmers land what they have used currently as collateral. That means

Estimate animals of small landholder farmers in terms of birr or fixed assets

For small landholder farmers

- In order to increase small landholder farmer's access to credit, it requires more effort from households to overcome their drawback;
  - Creating close relationship with credit sources to get enough information
- In case of collateral, the researcher recommended that the household heads or the respondents form a group to obtain loan or credit from banks and microfinances. It means group lending is considered as collateral
- Small landholder farmers need to find new information about not only financial institutions but also everything related to their countries economy.

5.3.Suggestions for Further Research

This study was limited to determinants of access to formal credit with socio-economic and institutional variables and did not include macro- economic variables like inflation and gross domestic product in Ethiopian context. It would be expected that access to credit be extremely affected by those variable. Therefore, it is better to study by further researchers.

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Appendix

Conversion factor to estimate tropical livestock unit

Species of animals	**TLU**
Calf	0.25
Cow & Ox	1
Sheep & Goats (Young)	0.06
Sheep & Goats (adult)	0.13
Horse	1.10
Donkey (Adult)	0.70
Donkey (Young)	0.35
Chicken	0.013

Source: storck et al., (1991

Appendix I

Questionnaires Filled By Small Landholder Farmers

Bahir Dar University

College of Business and Economics

Department of Accounting and Finance

Questionnaire on Access to Formal Credit to Small Land Holders

Dear respondents, this is Abreu Yirdaw. I am a master's student and I am doing my research as a partial fulfillment of my degree in accounting and finance department, Bahir Dar University. The purpose of this questionnaire is to collect information on the **determinants of access to formal credit to small landholders** in Bahir Dar Zuria district. I want to assure you that this information will be used for academic purpose and your identity will not be disclosed to anybody. In addition, the information you are providing is kept confidential and used or transferred to a third party without your consent.

Hence, I kindly request you to take a few minutes and fill and return this questionnaire to me and you need not write your name. I want to thank you in advance for your cooperation.

Instructions

- Read each question carefully and put your answer by tick (Π) sign inside the boxes and cells in the table corresponding to the response that most accurately represents your views and/or level of agreement.
- Please put your answer in the provided box only.
- No need of writing your name.

Section I: Individual Characteristics of Farmers

(1) What is the name of your kebele? _____

(2) If you live in a rural kebele, what is its distance from the nearest town in Kms? _____

(3) How old are you?

1. Between 15- 24 years ☐
2. Between 25 – 54 years ☐
3. Between 55 – 64 years ☐
4. Above 65 years ☐

(4) Sex

1. Male ☐ 2. Female ☐

(5) What is your highest education level?

1. unable to rea and write ☐
2. Adult education ☐
3. Primary level ☐
4. Secondary level ☐
5. Other specify --------

(6) What is your farm size in hectare?

1. Less than 1 hectare ☐
2. Between 1 and 2 hectares ☐
3. 2 and above ☐

Section II: Access to Formal Credit

(7) Are you credit accessed or without credit accessed?

1. Credit accessed ☐ 2. Without credit accessed ☐

(8) If your answer is "Yes" to question 7, how long you used credit service from formal credit institutions?----------

Please indicate your level of agreement for the following statements by putting a tick mark (√) in the appropriate column containing Strongly Disagree, Disagree, Neutral, Agree and Strongly Agree.

Statement	Level of Agreement to Statements				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
) Currently I get sufficient credit services from formal lending institutions					
)) I obtain credit service from ACSI for the purpose of purchase of fertilizer & seeds, farm equipment, food, livestock, household goods and for debt payments					

1) I obtained credit service from CBE for the purpose of purchase of fertilizer & seeds, farm equipment, food, livestock, household goods and for debt payments					

Section III: Socio- Economic Characteristics of Farmers (√)

Statements	Level of Agreement to Statements				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
2) Do you have assets (land, house, vehicle, agricultural equipment and furniture and fixtures) as collateral					
3) Formal credit institutions are very worried about collateral in accessing credit					
4) do you agree that all Peoples save their money in formal credit institutions					
5) Household savers in the formal credit institutions have the ability repay their loan than non-savers					
6) at how much degree you are agree as you continue to save after repaying your loan					
7) I have enough information about formal credit institutions					
8) at how much degree you are agree that as you can get the information from radio, phone, internet, extension agents and from other farmers					
9) The lending institutions are very					

far from our home					
0) We have rural road that connects our kebele with woreda					
1) There is full infrastructure in our Kebeles					

Total number of in animals in TLU

Species of livestock	**Number owned**	**Purpose**
Ox		
Cow		
Calf		
Horse		
Donkey		
Goats		
Sheep		
Chicken		

Section IV: Institutional Characteristics (√)

Statements	**Level of Agreement to Statements**				
	Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
2) The lending procedure of formal credit institution is very complicated					
3) Formal credit institutions have convenience working time of repayment for their clients					
4) Formal credit institutions have an ability to prepare an application letter and filling different formats					

5) There is working ethics and efficiency of officials in formal credit institutions					
6) We are getting sufficient interest rate of return for our deposits					
7) The interest rate of ACSI is higher than CBE					

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BAHIR DAR UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

Interview Guide on Access to Formal Credit to Small Land Holders

Personal interview for Microfinance and Bank managers

Dear Sir/Madam,

My name is Abreu yirdaw, a student at Bahir Dar University Department of accounting. Currently, I am conducting a study as a partial fulfillment of the requirement for my master's degree. This is being conducted in order to assess the determinant factors affecting loan portfolio quality in Micro finance institutions.

The information obtained from this session is kept confidential and used only for research purpose.

1. What do you say about access to formal credit for small landholder farmers from formal credit institutions you lead or manage with?
2. What are procedural requirements should fulfill by farmers to access credit services from your institutions?
3. Does small landholder farmer's use saving/deposit service from micro finance institutions in the area?
4. What are the constraints that the banks/financial institution have been facing in relation to delivery of credit services for farmers?
5. How do you organize small landholder farmers to save in your institutions?
6. Give any comment or suggestions on how to improve access to formal credit for small land holder farmers ---------- ----------

Appendix II

Binary Logistic Regression Result

Block 0: Beginning block

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	-.134	.106	1.598	1	.206	.875

Block 1: Method enter

Omnibus test of model coefficients

		Chi-square	df	Sig.
Step 1	Step	387.096	13	.000
	Block	387.096	13	.000
	Model	387.096	13	.000

Model summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	110.369[a]	.659	.880

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Classification Table[a]

	Observed		Predicted		
			are you credit accessed or without credit accessed?		
			Without credit access	With credit access	Percentage Correct
Step 1	are you credit accessed or without credit accessed?	Without credit access	182	10	94.8
		With credit access	6	162	96.4
	Overall Percentage				95.6

a. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	AGE	.205	.341	.362	1	.547	1.228	.629	2.395
	SEX	-.247	.723	.117	1	.732	.781	.189	3.222
	EDULVL	-.036	.264	.019	1	.890	.964	.575	1.617

COLLATERAL	3.421	.617	30.702	1	.000	30.611	9.126	102.679
FRMS	-.005	.391	.000	1	.989	.995	.462	2.140
SAVING	.770	.239	10.407	1	.001	2.161	1.353	3.450
INFORM	.672	.359	3.509	1	.061	1.958	.969	3.957
LIVESTOCK	-.059	.031	3.496	1	.062	.943	.887	1.003
CREDITEXP	.920	.168	29.954	1	.000	2.509	1.805	3.487
DISTNT	-.010	.248	.002	1	.968	.990	.609	1.609
INFRAS	-.257	.212	1.469	1	.226	.774	.511	1.172
LENPROCR	.126	.210	.360	1	.548	1.135	.751	1.714
INTERSTR	.755	.221	11.661	1	.001	2.129	1.380	3.284
Constant	-10.738	2.838	14.316	1	.000	.000		

a. Variable(s) entered on step 1: AGE, SEX, EDULVL, COLLATERAL, FRMS, SAVING, INFORM, LIVESTOCK, CREDITEXP, DISTNT, INFRAS, LENPROCR, INTERSTR.