IMPACT OF SAVING AND CREDIT COOPERATIVES ON RURAL HOUSEHOLDS POVERTY REDUCTION IN KACHABIRA WOREDA OF KEMBATA TEMBARO ZONE, SOUTHERN ETHIOPIA

M.Sc. THESIS

MIHRETU MULUGETA

JIMMA, ETHIOPIA
JUNE, 2020

Impact of Saving and Credit Cooperatives on Rural Households Poverty Reduction in Kachabira Woreda of Kembata Tembaro Zone, Southern Ethiopia

By

Mihretu Mulugeta

A Thesis

Submitted to the Department of Rural Development and Agricultural Extension, College of Agriculture and Veterinary Medicine, Jimma University In Partial Fulfillment of the Requirements for the Degree of Masters of Science in Agriculture (Rural Development)

Jimma, Ethiopia
June , 2020

DEDICATION

I dedicated this thesis manuscript to all my family (father, mother, brothers and sister) for tending me with cares, prayer and love and for their dedicated partnership in the success of my work.

STATEMENT OF AUTHOR

I hereby declare that this thesis entitled: "The impact of saving and credit cooperative on rural households poverty reduction in Kachabira woreda of Kembata Tembaro Zone, Southern Ethiopia" submitted for the partial fulfillment of the requirements for the Master of Science in Rural Developments and Agricultural Extension (Rural Development), is the original work done by me under the supervision of major adviser Mr.Adugna Eneyew and co-adviser Mr.Debebe Cheber. I solemnly declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma or certificate. Materials or ideas of other authors used in this thesis have been duly acknowledged and references are listed at the end of the main text.

Name: Mihretu Mulugeta Signature: 

Place: Jimma University, Jimma

Date of Submission: 09/06/2020

BIOGRAPHICAL SKETCH

The Author, Mihretu Mulugeta was born on 12 June 1992 in Kachabirra Woreda, Kambata Tembaro Zone of the Southern Nation Nationalities and Peoples Regional State of Ethiopia. He attended his elementary school in Gemesha primary school and he attended junior and senior secondary school in Shinshicho. He joined Arbaminch University in 2014 academic year and graduated with regular B.Sc. degree in Rural Development and Agricultural Extension in June, 2016. Soon after his graduation, he was employed by the Kachabira Woreda Cooperative Development office and has been serving as an inspector at cooperative associations till he joined the School of Graduate Studies at Jimma University in 2019 academic year.

ACKNOWLEDGEMENTS

First of all, I would like to say Glory be to the almighty God for being with me in all times during the period of this thesis work. Next, I am initiated to pass my extreme thanks to my major advisor Mr Adugna Eneyew and co-advisor Mr. Debebe Cheber for their un-repayable advice, guidance and assistance from the early beginning of my work up to the completion.

I would like to thanks Kachabira Woreda Administration and Kachabira woreda Cooperative Development Office for their coordination and financial support to succeed my Master of Science work.

I am also immensely acknowledging my family for their prayer and financial support to succeed my work safely.

ABBREVIATIONS AND ACRONYMS

AE	Adult Equivalent
ATT	Average Treatment effect on Treated
CSA	Central Statistical Agency
CBN	Cost of Basic Need Approach
EHNRI	Ethiopian Health and Nutrition Research Institute
FCA	Federal Cooperative Agency
FAO	Food and Agricultural Organization
GDP	Gross Domestic Product
GTP	Growth and Transformation Plan
Ha	Hectare
HICE	Household Income Consumption Expenditure
ICA	International Cooperative Alliance
IFAD	International Fund for Agricultural Development
IPL	International Poverty Line
KWCDO	Kachabira Woreda Cooperative Development Office
KWFEDO	Kachabira Woreda Finance and Economic Development Office
LDC	Less Developed Countries
LPM	Linear Probability Model
MFIs	Microfinance Institutions
MoFED	Ministry of Finance and Economic Development
NGOs	Non-Governmental Organizations
PSM	Propensity Score Matching
SACCOs	Saving and Credit Cooperatives
SNNPR	Southern Nations Nationalities Peoples Region
TLU	Tropical Livestock Unit
UNDP	United Nation Development Program

TABLE OF CONTENTS

Tables **Page №**

LIST OF TABLES

Tables Page №

LIST OF FIGURES

Figures Page №

LIST OF TABLES IN APPENDIX

Tables Page №

ABSTRACT

Ethiopia is one of the poorest countries with a per capita income of $790 and extensive poverty. Microfinance institutions especially saving and credit cooperatives have been proved in reducing poverty. However, the impact of these institutions in reducing poverty of rural households was less understood in Ethiopia and particularly in the study area. Therefore, the main objective of this study is to assess the impact of saving and credit cooperatives on rural households' poverty reduction in Kachabira woreda of Kembata Tembaro zone, Southern Ethiopia. By using both quantitative and qualitative data, members of saving and credit cooperatives were compared with non-members of saving and credit cooperatives for assessing the impact of saving and credit cooperative on rural households' poverty reduction. A multi stages sampling procedure was followed to select 331 sample households of whom 97 and 234 are members and non-members of saving and credit cooperative, respectively. Focus group discussions, Key informant interviews, and household survey were used to collect primary data. Secondary data was collected from journals, books, articles and office reports. The analysis employed both descriptive statistics and econometric methods. The cost of basic needs approach was employed to set poverty line in the study area. Accordingly, The Foster-Greer-Thorbecke (FGT), results shows that 26.3 % households live below the average total expenditure per adult equivalent/Year. Binary logit model shows that among significant variables hypothesized to influence participation in saving and credit cooperatives sex of household head, education level of household head, farm size, training, and dividend paid were influenced rural households' participation in the saving and credit cooperative positively. Whereas, distance to local saving and credit cooperative office and participation in other financial institutions negatively affect rural households' participation in the saving and credit cooperatives. Propensity score model result shows that participation in saving and credit cooperatives had a positive and significant impact on rural households' poverty reduction (income and expenditure in Birr).Similarly, The average treatment effect on treated results indicated that the average income and the average expenditure for saving and credit cooperative members' households was increased by 787.74 and 235.03 Birr respectively than their counterparts. Therefore attention should be given by concerned bodies *to raise awareness and strengthen rural households' participation in saving and credit cooperative.*

Key words: Poverty, Saving and Credit Cooperatives, Impact, Binary logit model and Propensity Score Matching

1. INTRODUCTION

1.1. Background of the study

Poverty is mainly a rural phenomenon as about 75% of the total world's poor people are living in rural areas (IFAD, 2011).The share of the global population living in extreme poverty as measured by the international poverty line (IPL, currently valued at US$1.90). One-third of the world's population consumed less than US$1.90, most of those people consumed at rates between US$1.00 and US$1.90 (World Bank, 2018).

Poverty is a major problem in most of the developing world, especially in sub-Saharan Africa. Three-fourths of Sub-Saharan African countries hosts over 18% in 2015 and, of the world's 28 poorest countries) 27 are in SSA, all with poverty rates above 30%. In Sub-Saharan Africa about 41 % live below the poverty line (World Bank, 2018).

Ethiopia is the second most populous country in Africa after Nigeria, and the fastest growing economy in the region. However, it is also one of the poorest countries, with a per capita income of $790 (World Bank, 2019).The level and spread of poverty in Ethiopia is extensive (MoFED, 2012). The proportion of population below the poverty line in Ethiopia is estimated to be 23.5% in 2015/16, with marked differences between urban (14.8%) and rural (25.6%) areas of the country. The rural poverty gap (7.4%) is nearly twice the urban poverty gap (3.6%). Moreover, the national poverty severity index is found to be 2.8 % with rural poverty severity index (3.1%) being considerably higher than that of urban areas (1.4%) (MoFED, 2017).

Poverty is pervasive and persistent in most developing countries. The main causes of economic suffrage are many but it is well understood that the most vulnerable population, those in a persistent poverty trap are those who lack physical and financial resources i.e. the financial constraints or credit constraints that hinder the acquisition of those resources to poverty-escaping scale (Calum, 2007).

In developing countries, like Ethiopia, microfinance institutions have been emerged as a financial institution with an aim of providing small sized financial service to the poor who were in need of financial services but lack of access to formal commercial banks. The microfinance institutions services include; provision of small size of loans, saving, insurance services, money

transfer and other relevant services to the target poor people who were excluded by conventional commercial banks due to lack of collateral requirements (World Bank,2011).

Among rural microfinance institutions, saving and credit cooperatives (SACCOs) are widely seen to have potential to impact on development and poverty reduction (UN, 2009).In Ethiopia there were around 18,527 primary saving and credit cooperatives from those 1,894,212 males and 1,478,158 females totally 3,372,370 members with total capital of 2,491,955,609.70 ETB and total saving of 6,850,547,578 ETB (FCA, 2016).However, failure to consider how saving and credit cooperatives benefit in micro financing and limited research and innovations in the micro finance industry are among the identified problems of microfinance development (IFAD, 2009).

The populations of Kachabira Woreda are one of the poorest populations out of seven woredas populations of Kembata Tembaro zone. The average ten years data that indicates about 21.33% of Kachabira Woreda populations are food aid recipients and safety net programme beneficiaries every year, this figure raised to 60% in 2008 (FDPPC,2008). This implies above half of the population of Kachabira Woreda were poorer. Therefore, in terms of their crucial role in reducing poverty, in depth study on impact of saving and credit cooperatives on rural households' poverty reduction and identifying different institutional, economic, physical and demographic factors that affect rural households participation in these institutions were needed in the study area because the issue of poverty is a serious problem.

1.2.Statement of the problem

About one in five persons in developing regions live on less than $1.9 per day (World Bank, 2018). Most developing countries depend on their agricultural sectors for economic growth, food security and poverty reduction. Gross domestic product (GDP) growth deriving from agriculture is twice as effective in reducing poverty compared to GDP growth associated with non-agricultural sectors (World Bank, 2013). However, without a significant improvement in the access of farmers to technology, markets, information and credits, agricultural sector will not be able to adapt production systems and cope with the challenges it is facing (FAO, 2016).

Ethiopia is a low-income country ranking 164th out of 187 countries (World Bank, 2017).From the total estimated number of population of 93 million, around 21.8 million people live below poverty line (MoFED, 2017).

Microfinance institutions especially saving and credit cooperatives have been proved in reducing poverty (Ahmed and Kaleem, 2010). Active membership in cooperative activities has been described as a veritable way of reducing the poverty of rural households (Oluwatayo, 2009). However, SACCOs have been facing numerous problems such as poor members' participation, the shortage of capital misuse by selected committees, misappropriation by leaders, poor administrative skills, and irresponsible lending to members, limited access to banking services and too long periods between audits (World Bank, 2011).

Some of the studies that have been done in Ethiopia on the impact of saving and credit cooperatives on the socio-economic (or well–being) status of rural households in Ofla woreda in Tigray region (Kifle, 2012), impact of saving and credit cooperatives on socio-economic condition of women in Mida Woremo District, North Shoa Ethiopia (Addisu, 2016), impact of saving and credit cooperatives on rural households food security (Zemen, 2014) and impact of microfinance on poverty reduction (Gizachew, 2017)

However, the above studies have some research gaps which were seen by researcher of this study during literature review. For instance, the study of Kifle (2012) didn't use matching evaluation method between treatment and control group for comparison and may not free from bias. Addisu (2016) study was only on women households, this might not represent population of men

households and also it leads to gender discrimination. Zemen (2014) study focuses specifically on the impact of saving and credit cooperatives on households' food security rather poverty reduction because poverty has multi directions. Gizachew (2017) study has no impact evaluation methods between members and non-members as Kifle's study (2012) and in addition to that Gizachew (2017) study was conducted on credit and saving share company rather saving and credit cooperatives.

Moreover, the above studies didn't focus specifically on the impact of saving and credit cooperatives on rural households' poverty reduction. In addition to that the previous studies didn't address dividend paid as factor which may affect rural households participation in SACCOs positively or negatively but this study adds dividend paid as institutional factor which may affect member's participation in saving and credit cooperatives positively or negatively.

In kachabira woreda majority of rural societies are poor and they depend on agricultural activities for their livelihood purpose (KDFEDO, 2018). A total 304 participated respondents in the survey report indicated that average annual income of respondents was 113 USD, which was half of the estimated real per capita income of 235 (World Vision Ethiopia,2010).

In Kachabira woreda there were around 29 primary saving and credit cooperatives. However, the impact of these institutions in reducing poverty of rural households was less understood by societies and members' participation was not as much as an expected level due to lack of in-depth studies in the study area (KBWCDO, 2019).

Therefore, this inspires the researcher to fill the above stated research gaps and to assess impact of SACCOs on rural households poverty reduction in the study area in order to generate information to existing body of knowledge.

1.3. Objectives of the study

1.3.1. General objective

The general objective of the study is to assess impact of saving and credit cooperatives on rural households' poverty reduction in Kachabira woreda of Kembata Tembaro Zone, Southern Ethiopia.

1.3.2. Specific objectives

- To assess poverty status of rural households in the study area
- To analyze factors affecting rural households participation in saving and credit cooperatives in the study area
- To investigate the impact of saving and credit cooperatives on rural households poverty reduction in the study area.

1.4. Research questions

1. What is the poverty status of rural households in the study area?
2. What are the factors that affect rural household's participation in SACCOs in the study area?
3. What is the impact of saving and credit cooperatives on rural households' poverty reduction in the study area?

1.5.Scope and limitation of the Study

Due to time and resource constraint, the study was limited only to Kachabira woreda of Kembata Tembaro Zone. The study was designed to assess the impact of saving and credit cooperatives on rural household poverty reduction in kachabira woreda. It was directed to saving and credit cooperative members and non-members within the geographical location of kachabira woreda. The study was conducted in the year between July, 2019 and June 2020.

Studies carried out in many developing countries have pointed out that farmers are reluctant to provide accurate information on the variables such as income level, farm size etc., because these variables are sensitive to government taxes. This study might not be free from these limitations.

But to ease this problem as much as possible it was tried to persuade farmers individually and collectively about the objectives of the study.

1.6.Significance of the Study

The study will help the SACCO members to know the role that the SACCOs play in solving the problem of poverty. The study will also encourage rural households to join saving and credit cooperatives in order to obtain loan to improve their socio-economic status. The study will contribute to financial institutions and policy makers to design policies that are relevant to SACCOs in their effort to alleviate poverty among their members.

1.7. Organization of the study

The first chapter of this paper is about the introductory part including objective, research questions, the problem statement, scope and limitation and significance of the study. The second chapter deals with related literature on the topic. Chapter three explains the research methodology of the study. Chapter four deals with results and discussions of the study in line with the objectives of the study. Chapter five explains the summary, conclusion and recommendation of the study based on the major findings of this study.

1.8. Ethical Considerations of the Study

Issues of the research ethics were considered at all stages of this study. A letter was obtained from the university which declares the researcher's engagement in the research activities and the data collectors were read this letter to the participants of the research. Communications with respondent households' and data collecting activities was begin after permissions were obtained from Woreda Administration and kebeles administrators to get access to the study site.

In addition, the purpose of the research, duties and responsibilities of the researcher was discussed with the participants to obtain oral informed consent. All field notes and other documents of participants' responses were kept personal. Data analysis and report of the thesis was conducted with strict ethical manner not to manipulate the original information obtained from the respondents. Any information used in this thesis from other materials was duly acknowledged and properly cited.

2. LITERATURE REVIEW

2.1. Definition of key terms

Cooperatives: - are autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise (ICA, 1995)

Saving and Credit Cooperative (SACCO):- is one form of a cooperative society whose business is to provide financial services to its member's. SACCOs are legal institutions registered under the cooperative laws. SACCOs are owned by their members through payment of share capital and membership fees to the institution. In addition to the above**,** a savings and credit cooperative (SACCO) is a democratic, unique member driven, self-help, not for profit financial cooperative (Bailey, 2001).

Poverty: - is a complex human phenomenon associated with the inability to attain a minimum level of standard of living. It has multiple dimensions, manifestations and causes. The idea of multidimensionality of poverty has become quite common place among both academics and practitioners dealing with poverty. It has both income and non-income dimensions of deprivation. The latter is supposed to include deprivation of such tangible assets as land, savings and housing, as well as such non-tangible assets as health, education dignity and security (World Bank, 2001).

2.1.1 Theories of cooperatives

2.1.1.1 Neoclassical growth theory

According to neoclassical growth theory by Harrod-Dommar and Robert Solow's Savings mobilization is not an end in itself; it plays an important role in sustaining growth and development. Through savings there will be capital accumulation leading to investments hence economic growth and ultimate development. A high saving economy accumulates assets faster, and thus grows faster, than does a low saving economy. SACCOs in Africa are intended to offer an alternative to improving the desirable situation in low income countries. SACCOs are community membership based financial institutions that are formed and owned by their members

in promotion of their members economic interests. It can also contribute favorably to Human Integrated Development (Syed, 1991).

2.1.1.2. Agency theory

A cooperative is based on Agency theory, which is the relationship between agent and principals. Agency theory explains how best the relationship between agent and principals can be tapped for purpose of governing an organization to realize its goals. The members are interested in the accumulation of their capital, and managers who had a surplus of ideas to effectively use that capital. Since the owners of capital who are the members have neither the requisite expertise nor time to effectively run their cooperative, they hand them over to the managers for control and day to day operation, hence the separation of ownership from control, and the attendant agency problems. The primary participants are the managers, the management boards, and the members and, but other key players whose interest are affected by the cooperative are employees, suppliers, customers, partners, and the general community (Randall *et al*, 1997).

2.1.1.3 Marketing theory

According to marketing theory cooperatives capture a large share of industry earning for membership, but additionally, contribute to market or industry efficiency. Cooperatives mainly the farmers based are formed so as to market the members produce hence economies of scale. The exploitation of markets for the cooperative produce transpired guarantees the survival of a cooperative. The cooperative provided a good marketing channel and an instant payment system to farmers. It thus enabled farmers to buy inputs and other needed resources on time (Tewari, 2011)

Summary on theories of cooperatives

There were three types of theories of cooperatives discussed in this study such as neoclassical growth theory, agency theory and marketing theory of cooperatives. Among those theories neoclassical growth theory supports this specific study as through savings there will be capital accumulation leading to investments hence economic growth and ultimate development. A high saving economy accumulates assets faster, and thus grows faster, than does a low saving economy.

2.1.2. Why cooperatives are established?

The main reason and driving factor to establish cooperatives originate from the very nature humanity living together and determined to overcome challenges together with collective power for the common good of the society at large.

According to King *et al* (2007), cooperatives enable people to improve their quality of life and enhance their economic opportunities through self-help. The cooperative's objectives were to address members' needs for better housing, employment, food, education and other social requirements.

Consumer cooperatives provide their members with food and other products they need, while housing cooperatives provide shelter and worker cooperatives provide decent work. Credit cooperatives provide savings and credit, while agricultural cooperatives help farmers to organize the inputs they need to grow crops and keep livestock, and then help them to market and process their products (Johnston, 2004).

According to the World Bank (2003) financial cooperatives create access of the rural poor to a suitable diversity of products and institutions that fill the financial needs of low income rural clients in income generation and reduction of vulnerability. Well-functioning financial markets facilitate rural economic growth and poverty reduction by mobilizing and transferring funds, allocating them to productive investments (including improved agricultural technology and non-farm enterprises), and enabling households to smooth consumption and mitigate risks.

2.1.3. Types of Cooperatives

Cooperatives could be classified on the basis of the purpose for which they are established and on the nature of services rendered by them. Accordingly, they could be single purpose cooperatives or multipurpose cooperatives as is the case with most cooperatives. There are different types of cooperatives on the basis of the purpose for which they are established and on the nature of services rendered by them such as consumer cooperatives, worker cooperatives, housing cooperatives, agricultural cooperatives, saving and credit cooperatives (Dagnachew and Addissie, 2009).

Consumer cooperatives are owned by the people who do business there. One particularly common business is in retail food sales. The purpose of this cooperatives is to protect the society from unreasonable and inflated price on the consumption products and services and create an alternative market with fair and affordable price so that they will also play an important role by stabilizing the market as well (Andrew, 2006).

Housing cooperatives are owned by the residents. This can range from a single house to apartment complexes with thousands of units. It also includes co-housing projects, in which dozens of homes are cooperatively owned (Andrew, 2006).

Agricultural cooperatives are the most successful type of cooperative, measured by market share. Ever since the industrial revolution turned them into producers of food for distant markets rather than just for local consumption, farmers have needed to take control over three processes: farm inputs (such as fertilizer, seeds and livestock); marketing of the produce; and food processing to add value to the product. They have also needed a supply of credit, to smooth out the seasonal variability in farm incomes (Johnston, 2004).

Saving and Credit cooperatives have been developed to meet the fundamental human need to find a way of saving and borrowing without taking risks and without handing over too much power to a money-lender (Johnston, 2004).

2.1.4. Principles of Cooperatives

According to International Cooperative Alliance (2014), there are seven principles that govern cooperatives. These are voluntarily and open membership, democratic member control, member economic participation, autonomy and independence, education, training, and information, cooperation among cooperatives and concern for community.

Voluntarily and open membership principle makes voluntary organizations open to all persons able to use their services and willing to accept the responsibilities of membership without gender, social, racial, political or religious discrimination (ICA,2014).

Democratic member control principle makes cooperative societies as democratic organizations controlled by their members who actively participate in setting their policies and making

decisions. According to member economic participation principle embers contribute equitably to, and democratically control, the capital of their cooperative. Autonomy and independence principle makes cooperatives autonomous, self-help organizations controlled by their members (ICA, 2014).

Education, training, and information principle of cooperatives provide education and training for their members, elected representatives, managers, and employees so they can contribute effectively to the development of their cooperatives. They inform the general public - particularly young people and opinion leaders - about the nature and benefits of cooperation. According to cooperation among cooperatives principle, cooperatives serve their members most effectively and strengthen the cooperative movement by working together through local, national, regional, and international structures. Concern for community principle means cooperatives work for the sustainable development of their communities through policies approved by their members (ICA, 2014).

2.1.5. Overview of poverty

Poverty is a multi-faced phenomenon that actually hinders the satisfaction of human basic life requirements, i.e. the condition that deprives the individual the necessities for existence such as good food, potable water, shelter, clothing as well as those that bother on the security of life as health, education opportunities and freedom (Spencer, 2005).

Poverty is a generic subject that makes it difficult to give a single definition. As a result, there are different approaches in its conceptualization. Some conceptualize it as chronic and transitory. Chronic poverty is defined as lack of assets (land, livestock, etc.) and/or capability (health, finance, and education), which is structural and persistent from year to year. Transitory poverty, on other hand, is a temporary situation that happens due to some natural or human-made shocks like drought, war, flood, and so on (Brown &Teshome, 2007; Duclos *et.al*, 2010)

Another group contends poverty as “absolute” and “relative.” In absolute poverty, people are considered poor when some absolute needs are not sufficiently satisfied. In relative poverty or relative deprivation, a person is said to be poor if she or he has less than what others have (Bourassa, 2009 and Hales, 2007;Ravallion, 2003; Unwin, 2007 and World Bank, 1996).Also

other group conceptualizes poverty based on individuals' own declaration of their well-being status in a society, which is called subjective poverty definition. Unlike the other approaches, subjective poverty definition depends directly on the opinion and feeling of individuals to determine the minimum level of income or consumption that is acceptable in the society (Krishna, 2007; Nolan & Whelan, 1996).

2.1.6. Theories of poverty

2.1.6.1. Cultural theory

Cultural theories explain poverty in the traits of the poor themselves. These theories assert poverty as the valuation, attitudinal and behavioral patterns of the poor which prevent them from being socially mobile. Pertaining to this theory, poverty is created by the transmission over generations of a set of beliefs, values and skills that are socially generated but individually held. Individuals are not necessarily to blame because they are victims of their dysfunctional subculture or culture (David, 1970).

2.1.6.2. Structural theory

Structural theories explain poverty in terms of the conditions under which the poor live: unemployment, underemployment, poor infrastructures, poor education and poor health (David, 1970). Structural theorists fully accept the cultural theorists' characterization of the poor; they merely place another interpretation on it. Theorists in this tradition look to the economic, political and social system which causes people to have limited opportunities and resources with which to achieve income and wellbeing. Poverty is said to be caused by structural barriers that prevent poor from access to social services and accomplishment in key socials institutions includes jobs, education, housing, healthcare, safety and political representation (Maliyamkono, 2006).Among the challenges facing microfinance industry is high cost of service delivery with poor infrastructure. Because infrastructure and communication technology remain largely underdeveloped, it is significantly more expensive for MFIs to operate and reached the poor people. If access to credit can be improved, it is argued that, the poor can finance productive activities that will allow income growth. Microfinance institutions provides the possibility of

credit at times of need and in some schemes the opportunity of regular savings by a household (David, 1970).

2.1.6.3 Human capital theory

Human capital theory explains individuals' decision to invest in human capital (education and training) and patterns of individuals' lifetime income. Investment in education and training involves cost and those who will be compensated by higher life time incomes will choose to invest. Those who do not invest are more likely to be poor (Kernan and Ratcliffe, 2002).

2.1.6.4. Flawed character theory

Flawed character theory explain that people have ample opportunities for improving their economic status but lack the initiative and diligence to take advantage of the opportunities (Kernan and Ratcliffe, 2002).

2.1.6.5. Cyclic theory of poverty

The theory builds on the components of the other theories of poverty. It has its origin in the works of Myrdal (1957) who developed a theory of interlocking circular interdependence within a process of cumulating causation that explains economic development and underdevelopment. He analyses how personal and community welfare are closely linked in a cascade of negative Consequences-Lack of employment opportunities can lead to emigration, closing of retails stores, decline in local tax revenues, deterioration of schools, poorly trained workers, inability of firms to adopt cutting edge technology and lack of incentives to attract new firms which leads to greater unemployment and continues in a vicious cycle of poverty. For an individual, unemployment leads to low consumption, low spending, low savings and investments, loss of self-confidence, weak motivation and depression etc. One problem leads to multiple problems and generate poverty.

Summary on theories of poverty

In this study, five types of theories of poverty were discussed such as cultural theory of poverty, structural theory of poverty, human capital theory of poverty, flawed character theory of poverty and Cyclic theory of poverty. Among those theories of poverty, structural theory of poverty

supports this specific study because the structural theory links microfinance institutions through infrastructure and communications technology with poor as infrastructure and communications technology is significantly more expensive for MFIs to operate and reached the poor people. If access to credit can be improved, it is argued that, the poor can finance productive activities that will allow income growth.

2.1.7. Method of measuring poverty

Poverty is a complex human phenomenon associated with unacceptably low standard of living. It has multiple dimensions, manifestations and causes (World Bank, 2000). Any poverty analysis cannot be effective without proper understanding and measurement of poverty. However, there is no single satisfactory measure of poverty that could be universally applied (Ravallion, 1996).

According to Kenya Institute for Public Policy Research and Analysis (KIPPRA) (2005), largely there are two types of poverty measurements these are quantitative approaches and qualitative approaches. Quantitative approaches are best suited to answering questions related to poverty measurement. These are inherently quantitative issues, in the sense that they must be addressed using numerical information derived from sample surveys. Such data are analyzed using statistical techniques, with the interpretation of the results being guided by a discipline specific perspective, rather than by a broad social science model. Although qualitative (non-numerical) data can also be used to supplement the work of poverty measurement, they are not the main focus of poverty analysis. Further, even when such data are collected, they are often converted into numerical data, amenable to statistical analysis.

To identify "who is the poor" and "how poor is that person," it is intuitive to have some kind of cut-off point, which is called poverty threshold/line. Poverty line is a per capita income/consumption or a cut of living standard level below which an individual is considered to be poor (MoFED, 2002).Depending on the conceptualization of poverty, one can have an absolute poverty line, relative poverty line, or subjective poverty line (RioGroup, 2006).

Absolute poverty line is defined as a threshold level of income for buying essential items to meet certain absolute basic needs. Alternatively, it is a consumption level that allows one to fulfill minimum energy requirement and some nonfood needs. This entails the researcher to define the

type, quantities, and price of food and nonfood items that are included in the basket of absolute threshold (Rio Group, 2006).One of the common weaknesses of an absolute poverty line is it does not change with the living standards of the society in question. Thus, people are labeled "poor" when some absolute needs are not sufficiently satisfied, that is, needs that are not related to the consumption pattern of other people in a given society (Esubalew, 2006).

Relative poverty line, which is based on the conceptualization of poverty as relative deprivation, is set at one half, one third, or two thirds of the mean or median income or percentile of the income distribution. This involves classification of the population into different quartiles depending on the proportion chosen by the researcher. Finally, the researcher decides that the population in either the last one or two quartiles to be considered as poor (Rio Group, 2006).Such poverty definition reflects income inequality than absolute deprivation. Hence, it is widely used in developed nations where the interest is to narrow down the gap in prosperity (Ravallion, 1994).This approach is suffering from major shortcomings. First, it lacks clarity as to whether it is an indicator of poverty or measurement of income inequality. Secondly, the approach is entirely reliant on the value decision of the researcher that it is hard to monitor poverty over time or space. Thirdly, the relative poverty line is essentially quite arbitrary and always assumes a constant per cent of the population in the bottom as poor, even if living standards for the whole population have risen over time. Fourthly, such a method is technically feasible only for developed countries (Metalign, 2005; and Sallila*et al.*, 2004).

Subjective poverty line is the last type of poverty threshold constructed on the basis of individual's own perception of well-being in the society. Such type of poverty threshold is often used as complimentary to other poverty thresholds, and not commonly used in poverty studies (Rio Group, 2006).

After constructing poverty line, it is now easy to answer the question: "who is poor?" Those people whose income/consumption expenditure below the poverty line are said to be poor. The magnitude of poverty is then calculated with the help of indices. There are three classes of poverty indices that are used to measure the magnitude of poverty: poverty head count index (HCI), poverty gap index, and squared poverty gap index. The HCI is simply the ratio of the number of poor people to the total population in a community. Although still widely used, it is an

unsatisfactory measurement for two important reasons. First, it says nothing about how farther income/consumption expenditure of the average poor person is from the poverty line, that is, the poverty gap. Second, poverty measures should decrease if the chronically poor individual receives income or consumer commodities from the moderately poor individual. However, the measure does not reflect such transfers. The poverty gap index measures the depth of poverty. It reveals the transfer needed to bring the poor to a minimum level of consumption. The squared poverty gap index measures the severity of poverty (Sen, 1976).

Squaring the poverty gap index assigns larger weights for incomes farther away from the poverty line and as a result it takes inequality or distribution of income among the poor into account (World Bank, 2005). This is the only measure among the three that indicates the severity (intensity) of poverty in a population. The Foster, Greer and Thorbeck (1984) termed as FGT model considers all the above indices as a family of measures.

2.1.8. Setting poverty line

In the analysis of poverty, the starting point is the identification of the poor from the non-poor. To deal with this, poverty line plays a vital role in quantifying the various indicators of wellbeing into a single index (Ravallion, 1992). Even though the choice of poverty line is always arbitrary from country to country, the common argument is that, there is a minimum level of consumption of goods and services below which it is difficult to sustain our life. Therefore, in order to get the poverty line, it demands thorough work in that the level and type of goods and services must be precisely identified (Fitsum, 2002; Metalign, 2005 and Tassew *et al*., 2008).

2.1.8.1. Income based approach

Income allows people to satisfy their needs and pursue many other goals that they deem important to their lives. In particular, an indicator such as disposable income is desirable as a welfare measure as, in general, it is an effective proxy for the resources that are available to an individual or household for either consumption (if they so wish) or saving. Income is relatively cost effective to collect, compared with consumption expenditure. Even if administrative data are not available, the relatively small number of potential sources of income means that data collection can potentially be relatively straightforward. This makes income-based poverty

measures particularly useful. However, due to its nature, income data is highly exposed to respondents (i.e., reported income by households) under reporting bias. Income usually lacks objectivity and reliability is difficult to remember when generated from self-employment and many households have a tendency to under or over report their income (World Bank, 2005).

2.1.8.2. Cost of basic needs approach (CBN)

The cost of basic needs approach begins with a nutritional threshold chosen to reflect minimal needs for a healthy life, adjustments are then made for non-food expenses like housing, clothing and social values and applicable if the price information of the goods and services consumed by the poor is easily available (World Bank ,2005).This involves a series of steps. First, it uses the data to construct a typical diet for the poorer half of the sample, using expenditure shares. These expenditure shares are then converted into calorie shares, using standard calorie conversion tables. The resulting diet is recalculated to exactly obtain 2200 Kcal per day per adult, i.e. the recommended minimum requirement per day according to the World Health Organization. The quantities of each food item in this diet to obtain this minimum level of consumption are then valued in terms of birr (the local currency). The total value of that basket constitutes the basic food needs and non-food needs, or the food poverty line (World Bank, 2005).

2.1.8.3. Direct calorie intake method

In the direct caloric intake method, the poverty line is defined as the minimum calorie requirement for survival. Individuals who consume below a predetermined minimum calorie intake are considered to be poor. However, this approach does not account for the cost of obtaining these calories and ignores non-food needs (Tassew *et al.,* 2008).

2.1.8.4. Expenditure based approach

The expenditure measure includes spending on items that tend to be purchased frequently (for example, food, drink, household consumables, petrol), as well as expenses that are incurred less frequently (for example, household furnishing and appliances, other durable goods (Sofiya, 2018).Conceptually, consumption expenditure is thought to be a better measure of achieved living standards as it is through the consumption of goods and services that people satisfy their needs and wants over time. Supporting this argument, researchers have found a stronger

relationship between consumption and subjective well-being than between income and subjective well-being (for example, Lewis, Snape and Tonkin, 2014; Meyer and Sullivan, 2011).They also finds that household expenditure has a stronger relationship with people's life satisfaction than income. Advantage of consumption expenditure may be ascribed to the fact that survey questions about household spending are usually seen as less sensitive than questions about income (with some exceptions). Furthermore, people towards the bottom of the income distribution often have multiple income sources, which make measurement error harder to avoid. It is important to recognize. However, that consumption expenditure data also have their limitations. From a conceptual viewpoint, the first thing to note is that consumption expenditure, which is measurable using Living Costs and Food Survey (LCFS).

2.1.8.5 Asset based approach

This approach simply tries to capture how long a consumer unit could maintain a standard of living above the poverty line had it no income, nor any financial resources and borrowing ability other than accumulated wealth. Asset-based approaches to poverty have the potential to contribute to our understanding of poverty traps (Carter and Barrett, 2006).

2.2. Empirical review

2.2.1. Savings and credit cooperatives in Ethiopia

The sources of finance are classified as formal, semi-formal and informal sources. Formal sources are providers of finance who are subject to banking laws of the country of operation and are engaged in loan extension to customers and diversified financial intermediaries. SACCOs are semi-formal financial institutions in the sense that they are registered entities and subject to all general rules, but are not subject to the same prudential standards applicable to formal financial institutions. Unlike the commercial banks and MFIs, savings and credit cooperatives are not subjected to the rigorous supervision and regulatory rule of the National Bank of Ethiopia (Wolday, 2002).

The first savings and credit co-operative in Ethiopia was established in 1964 by employees of Ethiopian Airlines. During the same period, credit co-operatives were established by employees of the Ethiopian Road Authority and the Telecommunication Agency. Currently, SACCOs in Ethiopia operate within the framework of the proclamation No. 147/98 and the proclamation No. 402/2004.The objective of this category of institution is mainly to provide savings facilities and granting short term loans to members in various firms. The sources of funds of the cooperative include shares, special savings, entrance fees and dues. Entrance fees and weekly dues are used for the administration of these societies. Shares held by members represent the main source of the loanable funds. The special savings may be shared at a particular time or distributed in rotation, while loans are given to members on personal recognition and, or, guarantors could be demanded if the members total financial holding in the society is inadequate. Many of these societies give loans for businesses that yield quick return. It is administratively easy and cheaper for banks to deal with large group. This is because transaction costs are proportionately higher for all small borrowers, although it tends to vary little with size of loans. Similarly, farmers within a cooperative union are able to put forward viable projects that would be acceptable to the banks (Tezeta and Deribe, 2013).

2.2.2. Status of poverty in Ethiopia

Ethiopia has witnessed one of the fastest growing non-oil and non-mineral economies in the world during the recent years. The economic growth has achieved has been higher than the growth achieved by most African countries and overtook Kenya as East Africa's largest economy in 2017 (IMF 2017). The Per capita GDP of the country has more than doubled from USD 396 in 2010/11 to about USD 794 in 2015/16. In an effort to achieve such economic gains, the Government has been implementing a series of poverty-focused development strategies and monitoring the progress in poverty reduction on a continuous basis (MoFED, 2017).

The national poverty incidence has declined markedly over recent years, in which the national headcount poverty rate fell from 29.6% in 2010/11 to 23.5% in 2015/16.Between 2010/11 and 2015/16 about 5.3 million people have been lifted out of poverty. While the total number of population increased from 84 million in 2010/11 to 93 million in 2015/16, the number of poor-population declined from 25.1 million to 21.8 million. The number of poor population is getting much lower than that of 1995/96 while the population is growing more than 2.5% per annum (NPC, 2017).

2.2.3. Impact of saving and credit cooperatives on poverty reduction in World

Study conducted by Khagraj (2012), on saving and credit co-operative as a poverty reduction in Nepal reveals that cooperative is the powerful medium of bringing a drastic change in social, economic and cultural aspect of its members. There can be great differences in social and economic level between the people who have been the members of cooperative and those who haven't been its members. His study reveals that the poverty level of the study area has dramatically decreased to 8.2% from 24.1% after becoming cooperative members. In this way there has been adopted many kinds of activities to increase income and reduce poverty level in the study area. The study also shows the important contribution of cooperative in the activities like, empowerment, easy loan, and increase in social participation. In this way there has been an important role of cooperative in reducing poverty in the study area. .

According to Obwanga (2010), SACCOs have positive impact on alleviation of poverty in study area as 95 % of the members fall above poverty level of expenditure of less than ksh 100 per day.

This is through generation of income generating businesses and providing for their healthcare, education and social welfare. The indicators of poverty including; health care, education and other issues that address reduction of poverty like small business ventures, emergencies like funerals, sicknesses and weddings are financed by SACCOs.

Access to finance to the poor is considered a tool for economic development and poverty reduction (Morduch and Haley, 2002; Khandker, 2003).

Dzandu and Oosterhout (2009) explained that there are positive developments associated with credit union membership. 90% of credit union members experience improvements in purchasing power, increased spending in education, business and durable assets than non- credit union members. Non - members of credit unions who do not have access to loans during the time of vulnerability take more drastic measures such as selling assets, cutting down more often on daily expenses and they take children out of school more frequently.

Saving and credit cooperatives have a significant role in provision of financial services to the poor. The SACCO savings safeguard poor households against the uneven income streams due to seasonal fluctuations in rural areas. Poor households are also able to accumulate wealth to finance long term goals (Ahimbisibwe, 2007).

There is a positive correlation between saving and credit cooperatives investment and poverty reduction. Beneficiaries who opted to invest their loans in income generating activities like starting new business and increasing assets of business have experienced poverty reduction as a result of increase in income and improved social services (Eleuter and Raphael, 2015).

Adedayo and Yusuf (2004) looked at the contribution of cooperatives to alleviating poverty in rural settlements in Kwara State Nigeria. They found that cooperative membership reduces poverty and enhances members' needs satisfaction through asset acquisition, expanding farmland, investment and children's education.

2.2.4. Impact of saving and credit cooperatives on poverty reduction in Ethiopia

Study on impact of Rural Saving and Credit Cooperatives on the socioeconomic (or well–being) of members in Ofla woreda in Tigray region revealed that out of the nine variables hypothesized to influence the economic change by saving and credit cooperatives, four (education, savings, number of times loan availed, and members' years of stay in the saving and credit cooperatives) were found to be statistically significant (Kifle, 2012).

Study on impact of saving and credit cooperatives on the socioeconomic conditions in Mida Woremu district also explained that the advancing credit by saving and credit cooperatives to community members in Mida Woremu district brought an income impact of ETB 5783 per annum. The result was significant at $p<0.001$. Similarly, the intervention has brought impact on the amount of total expenditure of the borrowers, which was estimated at ETB 7196 and also the result was significant at $p<0.001$(Addisu, 2016).

The study on Impact of Saving and Credit Cooperatives on Food Security in the West Amhara Region of Ethiopia confirms that rural saving and credit cooperatives participation improves household food security. Rural saving and credit cooperatives membership has made positive impact on household total non-food expenditure and food expenditure (Zemen, 2014).

A study conducted by Gizachew (2017) reveals that a positive value of average treatment effect on the treated (ATT) indicates that the households' income, expenditure and asset holding have been improved as a result of microfinance program intervention in the study area.

2.2.5. Factors affecting members' participation in saving and credit cooperatives

The study conducted by Gnigwo (2010) on factors affecting members' participation in SACCOs in Gambella town, South Western Ethiopia identified that some factors that were playing a negative role in members' participation include: differences in terms of large family size, giving more emphasis to other businesses, low level of monthly income, members' failure to mobilize their savings and to repay their loans before or on the specified time, ineffective leadership, running the business without business plan and unexpected interference of the government in some of the affairs of the SACCOs.

According to Samuel *et al.* (2013), the major reasons for non-participation were lack of information about SACCO programmes (44%) and low income (35%). Other reasons included fear of imprisonment in case of failure to pay and high interest influence SACCO participation negatively. Annual income and education level influence SACCO participation positively.

Clark (1991) identified the elements essential for securing active participation of farmers' groups such as: small homogenous group, supplementary income generation activities, institutional credit, group promoters, training to group members, group savings and ready access to extension service, participatory monitoring and evaluation.

Study conducted by Amine (2016) on the impact of microfinance on household livelihoods shows that age, family size, level of education and livestock ownership were found to have a positive and statistically significant effect on the probability of participation.

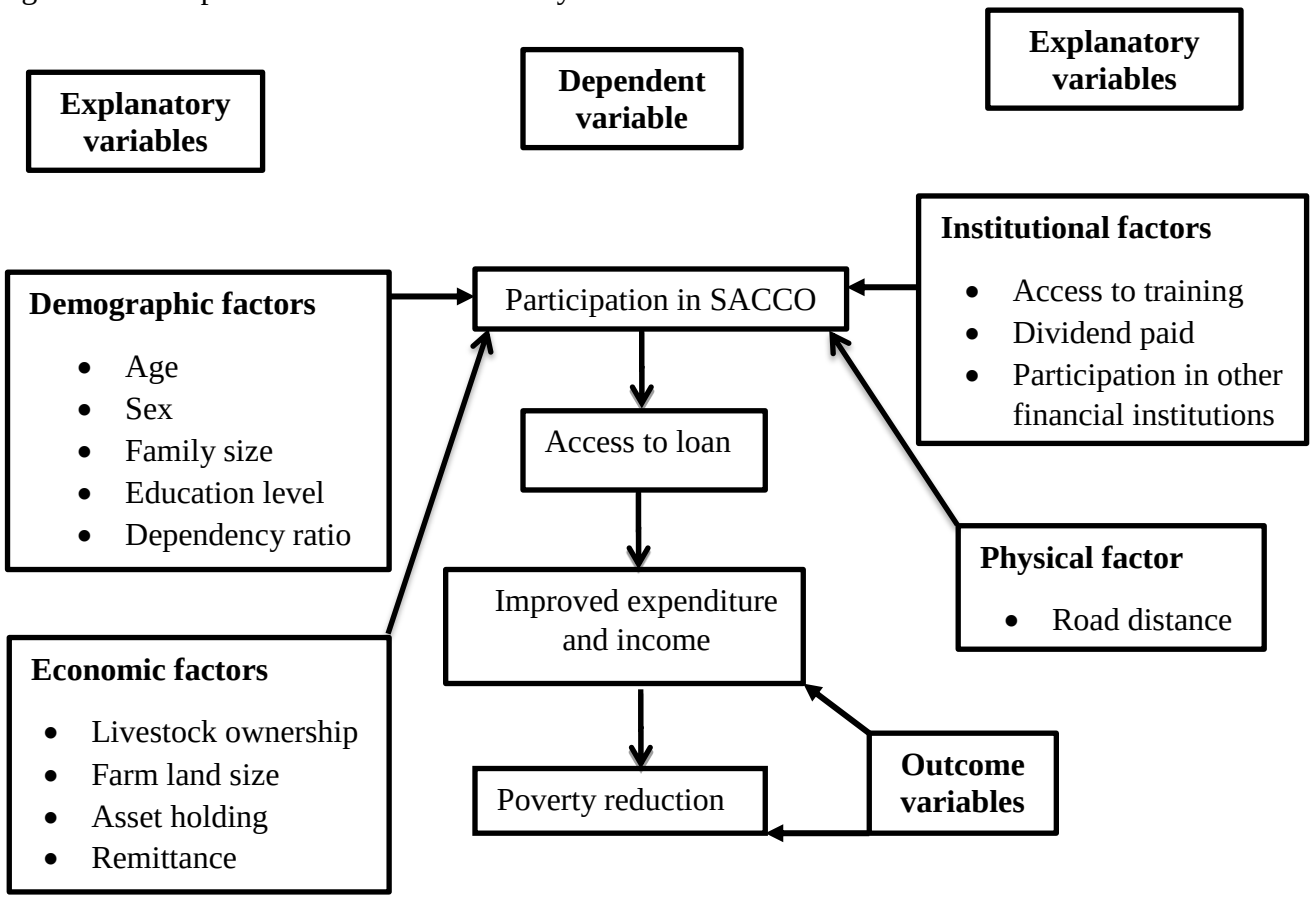
According to Birhanu (2018), the maximum likelihood estimate of the logistic regression model result shows that program participation status has been significantly influenced by six variables sex of household head, number of dependents in household, head education level, age of household.

Social responsibility and farm land size determines the probability of cooperative membership positively while road distance and market distance determines the probability of cooperative membership negatively (Musa and Hiwot, 2017).

2.3. Conceptual framework of the study

The conceptual framework (Fig.1) below shows impact of saving and credit cooperatives on rural households' poverty reduction. Participation in saving and credit cooperatives lead to access to loan for SACCO members, then they can directly or indirectly improve their annual income and expenditure status either engaging in different income generating activities or any other means. This directly led to poverty reduction. However, there are different factors such as demographic, economic, physical and institutional factors that affect participation of rural households in SACCOs positively or negatively. Generally, with saving mobilization there were easy access to credit and improved socio-economic status of households. Thus, participation in saving and credit cooperative has a great contribution on rural household poverty reduction.

Figure 1: Conceptual framework of the study



Adapted from Getaneh (2004)

3. RESEARCH METHODOLOGY

3.1 Description of the Study Area

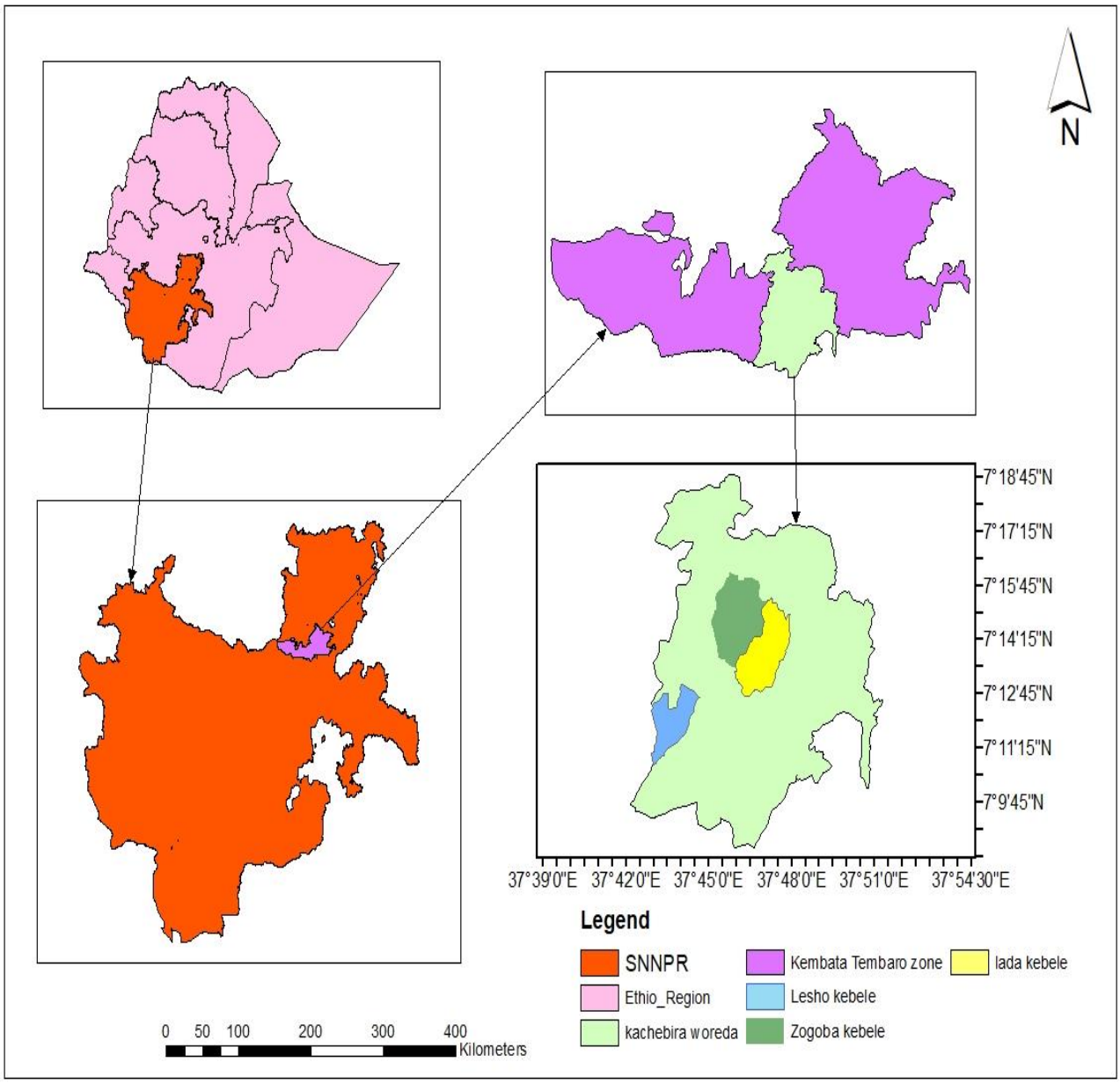
The study was conducted in Kachabirra Woreda of Kambata Tambaro Administrative Zone, located at by 293 km from Addis Ababa and 136 km from the regional capital, Hawassa and 17 km from zonal town Durame. Kachabirra is one of seven Woredas of Kambata Tembaro Administrative Zone in the SNNPR, and it consist a total of 21 Kebeles. It is bordered, on south west by the Wolaita Zone Boloso Sore district, on west by Hadaro Tunto zuria district and, on the north by Doyogena and Angecha district and on the east Kedida Gamella district. Kacha birra is located in southern and south western part of Ethiopia with latitude of $N7^{0}12'32"$ and longitude of $E37^{0}46'46"$ occupying about 36790 ha of land (CSA, 2011).

The total human population of the district 153, 677 is estimated from this, male and female accounts 75,556 and 78,121 respectively and the total number of households is estimated to be 28,753 from this, male and female accounts 24,475 and 4,278 respectively as reported by (KWFEDO, 2018).

Types of crops which grow in Kacha Birra woreda include maize, tef, wheat, barley, fruits and vegetables. It has two agro ecological zones such as woinedega and Dega. The major types of food crops grown in woinadega are maize, haricot bean coffee, enset, ginger, sweet potato, taro, banana, teff, pepper and fruits. In addition, in Dega wheat, barley, enset, beans and potato are grown. The major income sources for households in the woreda are ginger and coffee (CSA, 2005).

In Kachabira Woreda there were 29 saving and credit cooperatives. From the total number of 2403 members, 1440 were males and 963 were females with a total capital of 3,156,291.29 ETB and total saving of 522,057 ETB. As of September,2019, a total of loan Birr 4,994,674.00 was distributed to members of SACCOs in the woreda and from this distributed loan 4,022,435 ETB was returned (KBWCDO, 2019).

3.1.1. Map of the study area (Kachabira Woreda)



(Arc GIS, 2020)

Figure 2: Map of the study area

3.2. Research design

The study used a cross sectional research design by which data was collected at one time. Both qualitative and quantitative research approaches were applied. Combining qualitative studies with quantitative one can increase the perceived quality of the research (Demeke, 2001).

3.3. Sampling technique and sample size

For this study, multi stage sampling procedures were used. First, Kachabirra Woreda was selected purposively among seven Woredas of kembata Tembaro zone based on the researcher previous and current knowledge about the Woreda, large number of SACCOs , access to get data's and understanding poverty status of the study area. Second, among twenty one rural Kebeles of the Woreda; three rural Kebeles (SACCOs) were selected by using purposive sampling technique depending on in terms of performance of distributing loan and at least three years old SACCOs because of impact study. Third, households in the sample Kebeles were stratified into members and non-members of saving and credit cooperatives. According to Welman and Kruger (2002), "stratification ensures representativeness of different groups irrespective of sample size. Fourth, each kebele would share a probability proportion to sample size based on their number of households. Finally, household units were randomly selected from each stratum.

To determine representative sample from the total population 1910, Yamane's (1967) formula was employed with confidence level of 95% and a precision level of 5% as expressed below.

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

n = required sample size

N = the total households

e= the error term

Accordingly, the sample size for the study is determined as below:

$$n = \frac{1910}{1+1910(0.05)^2} = 331$$

To show proportionality to sample size by using Bowley (1926) formula:-

$$\text{Ni} = n\,\frac{Ni}{N} = \text{ki} = \frac{Ni(n)}{\text{N}} \qquad \text{i=1, 2, 3… ki= kebele 1, 2, 3}$$

Where *n* represents sample size, *Ni* represents population size of the i^{th} strata and *N* represents the population size.

In general sample size determination for this study was expressed below:

Table 1: Sample size distribution

Sample Kebeles	Total HHs	Stratification		Proportionate to sample size		Total sample HHs
		Members	Non-members	Members	Non-members	
Lesho	590	105	485	18	84	102
Zegoba	720	250	470	43	82	125
Lada	600	210	390	36	68	104
Total	1910	565	1345	97	234	331

3.4. Data sources and methods of data collection

In this study both primary and secondary data sources were used. Primary data sources were rural households (members and non- members of SACCOs).Secondary data sources were published/unpublished documents.

To collect primary data from sample households, structured questionnaire that consisted seven sections was prepared. The structured questionnaire was translated to Amharic language so as to prevent data distortions. The household survey was collected by two enumerators (one development agent and one cooperative promoter of specific kebele) per each kebele.

Moreover, Focus Group Discussions (FGDs) and Key informant interviews were conducted to triangulate data and complement the household survey.

Totally, a focus group of twenty seven participants (eleven female and sixteen male) who were selected based on data saturation method were held. The focus group discussions were conducted with fourteen members and thirteen non-members of SACCOs. The group discussions were taken 1:30-2:00 hour per Kebele on the issues of impact of SACCOs on household poverty

reduction and factors that affect rural households' participation in the SACCOs. The group discussions were led by researcher of this study.

Informal interview with one group of three purposively selected key informants who were community leaders and professionals who have first-hand knowledge about the community was carried out in each Kebele (totally nine persons) to generate information specifically on general contributions of SACCOs in reducing poverty in the study area and factors affecting rural households' participation in SACCOs in the study area. The interviews were also led by researcher of this study.

Secondary data was collected through searching different internet websites in order to get published documents (journals,books,articles) which were related to this study. Unpublished document data was collected from Kachabira woreda cooperative office, Kachabira Woreda Agriculture and Natural Resource Development Office reports and Kachabira Woreda Finance and Economic Development office.

3.5. Methods of data Analysis

The study applied both qualitative and quantitative analytical tools so as to provide a better understanding of the research problem. The qualitative data that was collected from group discussion and key informant interviews were organized in different themes and sub-themes in line with the objectives of the study. Similar responses were put together under one theme or sub theme in order to avoid generic and uncoordinated information. These actions were helped to ensure that no information left out. Then the collected data was analyzed by using qualitative method of data analysis (such as, narrative summary).

The quantitative data was analyzed by using descriptive statistics (percentages, standard deviation and frequencies) and econometric models (FGT model, Binary logit model and PSM model). FGT model was conducted for first specific objective which was poverty status of rural households, Binary logit model was employed for second specific objective which was factors affecting rural households participation in saving and credit cooperative and PSM model was applied for third specific objective(impact of saving and credit cooperatives on rural households poverty reduction. For these purposes appropriate statistical software (STATA 13) was used.

3.5.1. Poverty measures and procedures

There were a number of poverty measurements techniques as has been discussed under literature review (chapter two) part of this study among those, based on its robustness the Cost of Basic Needs (CBN) approach was applied to analyze household poverty status. According to MoFED (2005) Cost of Basic Needs (CBN) of the households can be computed first, by determining the food consumption bundle just adequate to meet the required food energy requirements (2200Kcal per day); and second, adding an allowance for non-food basic needs to this cost. The food consumed is then valued at the prevailing local price to obtain the food poverty line. The allowance for basic non-food consumption is again fastened on the consumption pattern of the poor.

The total kilo calorie obtained from 'basket' of food items of the family was divided by the adult equivalent to get the amount of average kilo calorie a particular household obtained per AE/day. By the same way, by taking the sum of average value local market prices of each food items and the average local prices for own produces and multiplying by the value of kcal/AE/day that obtained the amount of money need to get the 'basket' of food items for individual per day.

Finally the annual expenditure for food and non-food items added up and resulted an adjusted " cut-off point" as a poverty line which could enable identify a sample household as poor and non-poor.

Therefore, to classify households as poor and non-poor, the researcher set the annual expenditure for food and non-food average price (poverty line) for the study area.

After constructing the poverty line, level of poverty in the area were assessed. Thus, those people whose total food and non-food expenditure below the poverty line are said to be poor and above poverty line are said to be non-poor.

Foster, Greer and Thorbecke (1984) known as FGT Index which was commonly applied for poverty analysis was used to analyze level, incidence and severity of poverty in the study area. The three measures of poverty in the FGT index are the Head Count Index (P_0) which depicts number of population who are poor, Poverty Gap Index (P_1) which measures the extent to which

individuals fall below the poverty line and Poverty Severity Index (P_2) that demonstrates not only the poverty gap but also the inequality among the poor was used to compute these indices.

These indices can be computed using: Q as the number of people earning income below the poverty line, N is the total population, and then

The Head Count Index (P_0): It is defined as the proportion of the population whose measured standard of living is less than the poverty line. The headcount index does not tell us whether the poor are only slightly below the poverty line or whether their consumption falls significantly short of the poverty line. The head count measure also does not reveal whether all the poor are about equally poor, or whether some are very poor and others just below the poverty line.

It is given by PCI $=P_0=\frac{Q}{N}$ $---------- -1$

This can be rewrite as: $P\alpha\ (Z, Y)=\frac{1}{N}\sum_{i=1}^{Q}\left[\frac{Z-Yi}{Z}\right]^{\alpha}$ $---------- -2$

where, **$P\alpha$** is the measure of poverty index, **Z** is poverty line, **Y_i** is the actual expenditure or income of individual below the poverty line, **N** is the number of people, **Q** is the number of poor people normally those below poverty threshold and $\boldsymbol{\alpha}$ is Poverty aversion parameter i.e., the weight given or attached to the severity and sensitivity of the poor where $\boldsymbol{\alpha} \geq \mathbf{o}$, and the commonly used values of $\alpha$are 0, 1 and 2 (Araya, 2010).

Poverty gap Index (P_1): The poverty gap index indicates the depth of poverty, which is, the difference between the poverty line and the mean income of the poor expressed as a percentage of the poverty line. It taking the above representing style of variables and defining the poverty gap **(G_i)** as the difference of poverty line (**Z)** and the actual income **(Y_i)** for poor individuals and the gap is assumed to be zero for everyone else, Mathematically, PG was computed as follows:

$$pG = P_2 = \frac{1}{N}\sum_{i=1}^{Q}\left[\left(\frac{G_i}{Z}\right)\right] ---------- -3$$

Where $G_i = \frac{1}{N}\sum_{i=1}^{Q}\left[\frac{Z-Y_i}{Z}\right]$

Poverty Severity index (P_2): It is also known as squared poverty gap index or the Foster-Greer-Thorbecke index, measures severity of poverty by squaring and averaging the gap between the income of the poor and poverty line. Unlike the poverty gap index, this measure reflects the severity of poverty in that it is sensitive to inequality among the poor (Tassew *et al*, 2008). It was computed as: $PS = P_2 = \frac{1}{N}\sum_{i=1}^{q}\left[\frac{Z-Y_i}{Z}\right]^2 - 4$

3.5.2. Specification of econometric models

Two econometric models were applied to analyze the data. These were the binary logit / logistic regression model and the propensity score matching (PSM) models.

3.5.2.1. Binary logit model

There are several methods to analyze the data involving binary outcomes. However, for this particular study, binary logit model was selected over discriminant and linear probability models. The linear probability model (LPM) which is expressed as a linear function of the explanatory variables is computationally simple. However, despite its computational simplicity, as recommended by (Amemiya, 1981) and (Gujarati, 1995) it has a serious defect in that the estimated probability values can lie outside the normal 0-1 range. Hence binary logit model is advantageous over LPM in that the probabilities are bound between 0 and 1.

Moreover, binary logit best fits the non-linear relationship between the dependent and the explanatory variables. In the analysis of studies involving qualitative choices, usually a choice has to be made between logit and probit models. According to Amemiya (1981), the statistical similarities between logit and probit models make the choice between them difficult. The justification for using logit is its simplicity of calculation and that its probability lies between 0 and 1. Moreover, its probability approaches zero at a slower rate as the value of explanatory variable gets smaller and smaller, and the probability approaches 1 at a slower and slower rate as the value of the explanatory variable gets larger and larger (Gujarati,1995)

Hosmer Lemeshow (1998) pointed out that the logistic distribution (logit) has got advantage over the others in the analysis of dichotomous outcome variable in that it is extremely flexible and easily used model from mathematical point of view and results in a meaningful interpretation. In

statistics, binary logistic regression, or binary logit regression, or binary logit model is a regression model where the dependent variable is categorical/binary dependent variable (most commonly called dummy variables) - that is, where it can take only two values, "0" and "1", which represent outcomes members and non-members.

Logistic regression was developed by statistician David Cox in 1958. The binary logistic model is used to estimate the probability of a binary response based on one or more predictor (or independent) variables (features). It allows one to say that the presence of a risk factor increases the probability of a given outcome by a specific percentage.

Thus, binary logistic regression model was used to analyze factors that affect rural household participation in SACCO. The logit regression equation from which the probability of the outcome variable (Y) is predicted is given by:

$$P(Y) = \frac{\exp^{(b0+b1x1+b2x2+\cdots..bnxn)}}{1-\exp^{(b0+b1x1+b2x2+\cdots bnxn)}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (5).$$

Where: Where, P(Y) is probability of Y occurring, e is natural logarithm base (e ≈ 2.71828...), b0 is interception at y-axis, bn is regression slope coefficient of Xn, and Xn is predictor or independent variable that predicts the probability of Y.

Therefore, in this study the dependent variable SACCOs is dichotomous i.e. members and non-members of SACCOs and the explanatory variables were continuous and dummy So that, all explanatory variables were included in the model of binary logistic regression equation.

Multi-co-linearity test: Prior to the estimation of the logit model, it is by far logical to verify whether there is the problem of multi-co-linearity among explanatory variables included in the model. The reason for this is that the existence of multi-co-linearity affects seriously the parameter estimates. Accordingly, Variance Inflation Factor (VIF) technique was employed to detect the problem of multi-co-linearity for continuous explanatory variables (Gujarati, 1995). Each selected continuous variable was regressed on all the other continuous explanatory variables, the coefficient of determination (R_{xz}^2) being constructed in each case. If an approximate linear relationship exists among the explanatory variables then this results, in a

‘large’ value for R_{xz}^2 in at least one of the test regressions. A popular measure of multi-co-linearity associated with the VIF is defined as:

$$\text{VIF}= \frac{1}{1-\text{R}_{\text{xz}}^2} ----------------------------------6$$

Where R_{xz}^2 is the coefficient of correlation between variables of X and Z.

VIF shows how the variance of an estimator is inflated by the presence of multi-co-linearity. As R_{xz}^2 approaches 1, the VIF approaches infinity. That is, as the extent of collinearity increases, the variance of an estimator increases, and in the limit it can become infinite. As can be readily seen, if there is no collinearity between *X* and *Z*, VIF will be 1.A value of VIF greater than 10 indicate a problem (Gujarati, 2004).

Similarly, there may also be a linear association between qualitative variables, which can lead to the problem of multi-co-linearity or strong association. To detect this problem, coefficients of contingency were computed from the survey data.

The contingency coefficients are calculated as follows: $C = \sqrt{\frac{x^2}{\text{n}+x^2}} ---------- (7)$

Where: C = Coefficient of Contingency; x^2 = chi-square test and n = total sample size. The value of the Contingency Coefficient ranges between 0 and 1, zero indicating no association between the variables and values close to 1 indicating a high degree of association, which means high degree of multi-co-linearity.

3.5.2.2. Propensity score matching model

Propensity score matching (PSM), Difference-in-Difference, and instrumental variables methods are empirical models under non-experimental/quasi-experimental approach (World Bank, 2011). In the present study, the researcher adopts non-experimental approach involving propensity score matching model for the following justifications. Firstly, the study lacks baseline data or longitudinal data and thus depends on cross-sectional data for which PSM model is more appropriate. Secondly, impact assessment requires that the comparison group is matched to the treated group based on the predicted probability of participation given certain observable characteristics and thus PSM model is relevant as it is based on matching of propensity scores

between both groups. Therefore, PSM model was used to analyze the impact of SACCOs on rural households' poverty reduction. PSM is a non-parametric method that is widely used in the impact evaluation of different interventions (Ravallion, 2005); Heckman et al, 1998). The PSM is applied to estimate the Average Treatment effect on the Treated group (ATT) compared to the comparison group. In order to estimate ATT by using propensity score matching method the following steps such as estimation of the propensity scores, choosing a matching algorithm, checking on common support region, testing the matching balance and sensitivity analysis were employed.

The propensity score model is expressed as:

$$p(Xi) = pr\{D = 1 / Xi\} = E\{D / Xi\} \quad \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

Where D= (0, 1) is a participating variable (in this case membership status) and Xi is a vector of pre-participation covariates. Propensity score ensures that matching estimation is done on subjects that are similar as possible for effective comparison.

A binary logit model was used to estimate propensity scores using a composite of pre-participation characteristics of the sampled households and matching is then performed using propensity scores of each observation (Rosenbaum and Robin, 1983).Many explanatory variables were included as possible to minimize the problem of unobservable characteristics in evaluation of the impact of the rural SACCO.

There were various matching algorithms, from various matching algorithms nearest neighbor (NN), radius and kernel matching methods were applied for this study. However, these methods differ from each other with respect to the way they select the control units that are matched to the treated, and with respect to the weights they attribute to the selected controls when estimating the counterfactual outcome of the treated. All provides consistent estimates of the ATT and the overlap condition (Caliendo and Kopeinig, 2008 and Dehejia and Wahba, 2007).

Average treatment effect on treated and on population is only defined in the common support region. As stated by Caliendo and Kopeinig (2005), the common support region is the area within the minimum and maximum propensity scores of treated and comparison groups respectively.

Matching quality has to be checked if the matching procedure is able to balance the distribution of the relevant variables in both the control and treatment group, since conditioning is not on all covariates but on the propensity score. Method of covariate balance used are standard bias, t-test, pseudo-R2 and joint-significance between participant and non-participants household (Caliendo and Kopeinig, 2005 and Rosenbaum and Rubin, 1985).

Furthermore, final step in implementation of PSM is checking the sensitivity of the estimated result (Caliendo and Kopeining, 2005). However, a hidden bias arises if there are unobserved variables which affect assignment in to treatment and outcome variable simultaneously which nullify the Conditional Independence Assumption (CIA). This result in biased estimates of ATTs (Rosenbaum, 2002); since matching estimators are not robust against hidden biases, it is important to test the robustness results to departures from the identifying assumption. However, it is impossible to estimate the magnitude of selection bias with non-experimental data. Therefore, this problem can be addressed by sensitivity analysis (Caliendo and Kopening, 2005).

3.5.3. Variables definition and Hypothesis

3.5.3.1. Dependent variable

Dependent variable of this study is membership in SACCOs. It is a dummy variable (1=members; 0=non-members).

3.5.3.2. Outcome variables

Poverty reduction: poverty is an outcome variable and it is difficult to measure alone without its measurement indicators. Therefore this study adopted income and expenditure as indicators of poverty.

Annual Income: is a continuous variable measured in *Birr*. It refers to the total income of the household that is obtained by summing up income from the sale of crop produce, animal sale, animal products sale, and income from non-farm and off-farm activities annually.

Annual Expenditure: is continuous variable measured in Birr that represents households total food and noon-food expenditures by which households expend annually.

3.5.3.3. Explanatory variables

The Explanatory variables were identified from previous studies and the nature of the study area.

Sex: Refers to the sex of the household. It is dummy variable measured in (1 if male is the head, and, 0 if female is the head. A household headed by male influences participation in SACCO positively due to male headed households might have freedom to mobility and access to information on SACCO than female headed households (Birhanu, 2018).Therefore it was hypothesized to be affect rural household participation in SACCOs positively.

Age:-This refers to the age of the household head. It is continuous variable and measured by number**.** Age has positive significant effect on household's participation in SACCO. It is argued that age can be used as a proxy to measure the level of maturity in using loans more judiciously and shows the repayment capability of the borrower. This indicates that as client households get older, they accumulate experience, master the rules of the game, build confidence and thus increase their probability of borrowing (Amine, 2016).Therefore it was hypothesized to be affect rural household's participation in SACCOs positively.

Education level: - Education level is continuous variable and it is measured by year of schooling. Education has positive and significant effect on household's participation in SACCO. Education enables households to perceive, interpret and respond to new information faster (Amine, 2016) and Birhanu (2018).Therefore it was hypothesized to be affect rural households' participation in SACCOs positively.

Family size:-It indicates the total number of members in the household and it is measured by AE. If the number of members of the household increases, it was expected that consumption expenditure will increase and the amount of saving will be less (Gnigwo, 2010). Therefore it was hypothesized to be affect rural households' participation in SACCOs negatively.

Dependency ratio:- The number of the non-productive age groups, individuals whose ages areless than 14 years and greater than 64 years in AE, in relation to the number of productive age groups in the household. It is measured by AE It is assumed that the larger dependents in households need the more consumption expenditure. Therefore this leads to need more credit to

feed dependents in households (Birhanu, 2018). Therefore, it was hypothesized to be affect rural households' participation in SACCOs positively.

Farm land size: - Farm land size is continuous variable and it is measured by Ha. Farmers that have larger farm size are not only wealthier but also have a higher capacity to expand agricultural production that in turn forces the farmer to join cooperatives to sell the product and to access farm input easily (Musa and Hiwot, 2017).Therefore, farm size of households was hypothesized to have positive effect participation in SACCOs.

Access to training:-It is a dummy variable measured in (1=Received trainings, 0 = otherwise) access to training on advantages of SACCOs in improving living standard of rural households before membership would have positive impact on the decision of farmers to join cooperative to save (Berhane, 2010).Therefore it was hypothesized to be affect rural households' participation in SACCOs positively.

Dividend paid:-It is dummy variable measured in (1.Yes and 0.No).Dividend paid after audit is expected outcome by rural households from SACCOs. It was hypothesized to be affect rural households participation in SACCOs positively or negatively.

Road distance: -It refers to that road distance of households from their home to SACCO's office. It is continuous variable measured by Km/hr. The farther the distance between the rural poor member and the SACCO would lead to less interaction and limited saving in a SACCO (Musa and Hiwot, 2017).Therefore, it was hypothesized to be affect rural households participation in SACCO's negatively.

Remittance: - Represents whether the household head gets remittance inside and outside the country or not measured in (1 = yes, and 0 otherwise). It was hypothesized to have positive or negative effect on household's participation in SACCOs.

Asset holding of households: - It is continuous variable which is measured in converting physical assets in to ETB. Participation in SACCOs has a positive and significant impact on the livelihood indicator household asset holding (Gizachew, 2017).It was hypothesized to have positive effect on rural households' participation in SACCOs.

Participation in other financial institutions: - It is dummy variable measured in (1=Participant; 0=otherwise).Participation in other financial institutions determines the probability of cooperative membership negatively If members use other alternative financial institution that provides similar service with SACCOs; it becomes the competitor and decreases the amount of borrowing from RUSACCO (Zemen, 2017). Therefore; Participation in other financial institutions was hypothesized to have negative effect on rural households' participation in SACCOs.

Livestock ownership: Livestock ownership is continuous variable it is measured by Tropical livestock unit (TLU).There is a positive relationship between livestock ownership and participation in SACCOs. Borrowing from microfinance institution ensures the survival of livestock by enabling owners to purchase forage for their animals avoiding unplanned sale and effectively transferring value to the future when prices stabilize (Amine, 2016). Therefore, it was hypothesized to be affect rural households' participation in SACCOs positively.

Table 2: Summary of hypothesized explanatory variables

Variables Code	Description	Type	Measurement	References	Expected sign
Dependent variable SACCOME	Saving and credit cooperative membership	Dummy	1=Member 0=Non-member	-	
SEXHH	Sex of Household head	Dummy	1=Male headed; 0=Female headed	(Amine, 2016)	+
AGEHH	Age of Household Head	Continuous	Year	(Birhanu, 2018) and (Amine,2016)	+
EDLHH	Education level of Household	Continuous	Year of schooling	(Amine, 2016) and Birhanu (2018)	+
FSHH	Family size of households	Continuous	Total number of family in AE at each HH	(Amine, 2016) and (Gnigwo, 2010)	-
DR	Dependency ratio	Continuous	Number of the non-productive age groups in AE (age of <14 and>64)	(Birhanu, 2018).	+
FALS	Farm land size	Continuous	Ha	(Musa and Hiwot, 2017)	+
ACESTHH	Access to training	Dummy	1=Received trainings,0 = otherwise	(Berhane, 2010)	+
DP	Dividend paid	Dummy	1=Yes 0=No	-	±
RD	Road distance	Continuous	Km	(Musa and Hiwot, 2017).	-
RHH	Remittance receipt by households	Dummy	1=Received,0 = otherwise	-	±
AHHH	Asset holding of households	Continuous	Converted to ETB	(Gizachew, 2017).	+
POFI	Participation in other financial institutions	Dummy	1=Participant;0=Other wise	(Zemen, 2017).	-
LOHH	Livestock ownership of households	Continuous	Total livestock unit (TLU)	(Amine,2016)	+

4. RESULTS AND DISCUSSION

This chapter is presents the results of the study in light of the objectives of the study by using descriptive and econometric analyses. It is organized into three sections. Section one presents the results of the descriptive statistics on the demographic, Economic, physical and institutional characteristics of sample HHs using independent sample and chi-square tests of significance for continuous and dummy variables respectively. The second section presents the poverty status of the rural households in the study area by using the specifications described in chapter three. It also presents the patterns of consumption expenditures among the members and non-members HHs of SACCO. Section three presents the empirical results of econometric analysis of the study.

4.1. Descriptive statistical results

4.1.1. Descriptive statistics results for dummy variables

The survey result showed that the sex composition across the member and non-member groups were 80.41% and 54.70% respectively was male headed households. The result of the chi-squared test ($\chi 2$= 19.288) for the sex composition across the member and non-member groups reveals that sex was statistically significant at less than 1% probability level. This clearly implies there was highest percentage of male headed households within both members and non-members of rural households compared with their counter parts.

The percentage of rural households who had received training on awareness creation about advantages of saving and credit cooperatives in improving saving habit was greater for members (71.13%) than non-members households (40.17%) and the percentage of rural households who had not received training was greater for non-members (59.83%) than members households (28.87%). Furthermore, the Chi-square analysis (x^2=26.30, p<0.01) showed that access to training and membership status has statistically strong significant association. Moreover, the above percentage implies that giving training about advantages of SACCOs before membership gives highest opportunity to join SACCOs.

Dividend paid is the case which makes SACCOs odd from other financial services, because even if they pay interest rate on borrowing they get back it in the form of dividend. Table 3 portrays

that on the question asked by saying "if dividend is paid at end of each year, can it enhance participation in SACCOs"? As respondents' response, the percentage of answer which says "Yes" was 73.20 % and 55.88 % for members and non-members respectively. Furthermore, the *Chi*-square analysis (x^2 =8.542, p=0.05) showed that dividend paid and membership status has statistically significant association.

As can be observed in Table 3, of the members 64.85 % and from the non-members 91.45 % had participated in other financial institutions whereas, 35.05% of the members and 8.55 % of non-members didn't participated in other financial institutions. There was also statistically significant difference between the member and non-member groups with regard to participated in other financial institutions. Furthermore, *Chi*-square analysis ($\chi 2$= 8.542, p<0.01) reveals that there was statistically strong significant difference between the member and non-member groups at 1% significance level in the study Woreda.

Regarding to remittance receipt among rural households, the survey result indicates that the proportion of member households (30.93%) receipt remittance was more than that of the non-member households (29.49%) whereas, 69.07% of the members and 70.51% of non-member households didn't receive remittance. Additionally, *Chi*-square test ($\chi 2$= 0.067) reveals that there was no statistically significant difference between the member and non-member groups in remittance receipt in the study area.

Table 3: Descriptive statistics results for dummy variables

Variables	**Category**	**Membership status**		χ^2	**p-value**
		Member	**Non-Member**		
		%	%		
Sex	Male	80.41	54.70	19.288	0.000
	Female	19.59	45.30		
Training	Received	71.13	40.17	26.30	0.000
	Not received	28.87	59.83		
Dividend paid	Yes	73.20	55.88	8.542	0.003
	No	26.80	44.02		
Participation on other credit institution	Yes	64.85	91.45	35.38	0.000
	No	35.05	8.55		
Remittance	Received	30.93	29.49	0.067	0.79
	Not received	69.07	70.51		

Source: Own survey result, 2020

4.1.2. Descriptive statistics results for continuous variables

As table 4 presents, the average age of sample member rural households were (M=39.18, SD= 4.04) years, whereas the average age of non-member rural households were **(**M=38.63, SD=4.03) years. This implies that the average age of member rural households were higher than the average age of non- member rural households' which means members were elder than non-members' households. However, the test result (t-test=-1.125) indicated that there was no statistically significant mean difference between members and non-members age of the rural households.

The result of Table4 shows that member rural households had better educational level (M=5.09, SD=3.09) than non-member (M=3.29, SD=3.23). Furthermore, the t-test result (t-test= -1.039, $p<0.01$) indicated that there is a statistically strong significant difference between members and non-members educational level at less than 1% probability level. This implies that educated households are supposed to have more level of awareness on being membership to SACCOs than non-members households'.

Family size in this study was considered as the number of individuals who resides in the respondent's household in AE. The result of table 4 portrays that the average family sizes of the member rural households (M=4.53, SD=1.47) was smaller than non-member (M=4.79, SD=1.56). However, there is no statistically significant difference between members and non-members family size. This implies that rural households with small family size have equal chance to be a member of SACCOs with larger family size.

Dependency ratio is defined as household members above 65 years and below 15 years in AE. Table 4 shows that the average value of the dependency ratio of the SACCOs member households was found to be 2.67 dependents in AE with a standard deviation of 1.10. Similarly, for the non-member households the average dependency ratio was 2.51 dependents in AE with a standard deviation of 1.39. While testing for the existence of mean difference in dependency ratio, the t-test (t = -0.959) confirmed that there is no statistically significant difference between dependency ratio and membership status. Even though, the observed average dependency ratio of the members appears higher than the non- members, it was not statistically significant.

Land is the single most important resource, as it is a base for any economic activity especially in rural and agricultural sector. As the result in table 9 presents, members had greater land size (M=1.24, SD=0.52) than non-members (M=0.98, SD=0.459). Furthermore, the t-test result (t-test= -4.391, $p<0.01$) shows that there is statistically strong significant mean difference between average land size of members and non-members of SACCOs at less than 1% probability level.

Livestock is the rural households' important source of income. As indicated in table 4, the average livestock ownership of sample rural households in TLU of members (M=2.38, SD=1.23) was greater than non- members (M=2.03, SD=1.32). On the other hand, the t-test result (t-test=4.888, $p<0.05$) revealed that there was statistically significant mean difference in average tropical livestock unit between the members and non-members households at 5% probability level.

Assets in this study were total physical assets that rural households have such as living house, bed, radio, mobile phone, chairs, tables, boxes etc converted in to ETB. Table 4 results that average asset holding of member rural households (M=27561.31, SD=3711.49) was greater than average asset holding of non-member rural households (M=27156.26, SD=4420.23).However, the t-test result (t-test= -0.793) reveals that there was no significant mean difference in average asset holding between the members and non-members households

Road distance in this study refers that distance of road from respondents' home to rural saving and credit cooperative center in Km. Table 4 portrays that average road distance in Km of saving and credit cooperative members was (M=1.34, SD=0.89) and average road distance in Km of saving and credit cooperative non- members was (M=2.04, SD=0.083).This implies that mean road distance of non-member households was greater than mean road distance of member households. Moreover, statistical t-test ($t = 1.371$, $p<0.01$) confirmed that there was statistically strong significant mean difference in average road distance in Km of members and non-members of SACCOs at less than1% probability level.

Table 4: Descriptive statistics results for continuous variables

Variables	Membership status						t-test	p-value
	Member (n=97)		Non-Member (n=234)		Total (n=331)			
	Mean	SD	Mean	SD	Mean	SD		
Age	39.18	4.04	38.63	4.03	38.79	4.04	-1.125	0.261
Education	5.09	3.09	3.29	3.23	3.8	3.29	-1.039	0.000*
Family size	4.53	1.47	4.79	1.56	4.71	1.54	1.368	0.172
Dependency ratio	2.67	1.106	2.51	1.39	2.56	1.32	-0.959	0.338
Farm size	1.24	0.52	0.98	0.459	1.06	0.49	-4.391	0.000*
Livestock holding in TLU	2.38	1.23	2.03	1.32	2.14	1.30	-2.201	0.028**
Asset holding	27561.31	3711.49	27156.26	4420.23	27274.96	4223.36	-0.793	0.427
Distance to SACCO	1.34	0.89	2.04	0.083	1.84	1.22	4.888	0.000*

Source: Own survey result, 2020

4.1.3. Impact of SACCOs on rural households' poverty reduction (for members of SACCOs)

Table 5 presents impact of SACCOs on members household poverty reduction .Accordingly,majority of respondents answer Yes (95.88%) for the the question, did your participation in SACCOs contribute for poverty reduction? This result is consistent with the results of focus group discussions by which majority of focus group participants reveals that the loan that they borrow from SACCOs improve their living standard in terms of educating their children,engaging in income generating activities and improving their total food and non-food expenditures. Therefore SACCOs has a crucial role to reduce rural households' poverty.

Table 5: Impact of SACCOs on rural households' poverty reduction (for members of SACCOs)

Did your participation in SACCO contribute for poverty reduction?	Response	n (97)	%
	Yes	93	95.88
	No	4	4.12

Source: Own survey result, 2020

4.2. Poverty status of the rural households in the study area

To attain the first objective which is related to the measurement of the status of poverty among the rural HHs, the Cost of Basic Needs (CBN) approach was employed in estimating the poverty line. In this section, the estimated poverty line and the extent of poverty among the sample rural HHs was presented using the approaches specified and discussed in chapter three. The first part of this section deals with estimation of poverty line, a benchmark cut of point, beyond which household is poor or not.

4.2.1 Poverty line in the study area

In order to capture poverty status of the household, the study has assessed different staple food items and non-food items during the household surveys. A household can be computed first, by determining the food consumption bundle just adequate to meet the required food energy requirements; and second, adding an allowance for non-food basic needs to this cost. The food consumed is then valued at the prevailing local price to obtain the food poverty line. The allowance for basic non-food consumption is again fastened on the consumption pattern of the poor. Thus by taking food expenditure of the first lower quartile of the sample population it was found to be **7266.49** Birr per AE/Year (Table 6) and by taking directly the mean non-food expenditures of first lower quartile which was found **3879.3** Birr per AE/Year (Table 7), and hence the total poverty line comes **11145.79 Birr** per AE/Year.

Table 6: Food consumption of the lowest income quartile households

Food items	Mean kcal per kg/lt	Gram consumed per adult per day	Kcal per day per adult	Kcal share (%)	Mean price per Kg/Lt (Birr)	Value of poverty line per year (Birr)	Expenditure share (%)
*Cereal	3470	487.53	1478.8	67.13	18	3203	44.07
*Milk	850	2.866	104.5	4.75	17	1621.49	22. 32
*Sugar	1780	79.42	53.9	2.45	20	579.79	7.97
*Meat	1970	32.88	77	3.50	140	1100.81	15.15
*Oil & fat	8120	5.48	99.92	4.64	21.5	230	3.21
*Coffee/Tea	1190	3.29	9.46	0.43	19	120	1.65
**Enset (*kocho)*	2111	118.0	201.94	9.17	15	158	2.17
**Taro	1038	284.84	160	7.27	5	100	1.37
*Salt	1780	4.93	12.32	0.56	13	23.4	0.32
***Vegetables	370	5.84	2.16	0.10	20	130	1.77
Total			**2200**	**100**		**7266.49**	**100**

Source: Own survey result, 2020 and the mean kcal per kg/lt is extracted from*(MoFED, 1999/2000) ;**(Tilahun *et al.*, 2004) ***(EHNRI, 1968-1997)

Table 7: Non-food expenditure of the lowest income quartile households

Expense type	**Mean value of expenditure (ETB)**
Health care	481.66
Clothing and foot wear	1000.67
Schooling and stationary	717.09
Social and religious	529.83
Land tax	273.48
Transport	631.74
Kerosene	244.83
Total	**3879.3**

Source: Own survey result, 2020

4.2.2. Poverty indices in the study area

The poverty measure (Pα) developed by Foster, Greer and Thorbecke (1984) was used to explain the extent of poverty in the study area.

Table 8 below indicates that poverty incidence was 0.263 in the study area, implying that 26.3% of the surveyed households were poor and unable to meet the minimum basic needs for their household members. In other words, 26.3 % of the sample households live in absolute poverty in the study area.

Rural poverty status is determined by birr less than 11145.79 per AE/Year is poor and greater than or equal to 11145.79 per AE/Year is non-poor. The regression value display that from 331 sample household 87 (26.3%) is poor and 244 (73.7%) is non-poor.

The total rural poverty depth for the study area was 0.078 which implies that on average, up to 7.8 % of the poverty line resource should be mobilized by average household to bring them to preset poverty line to the study area. To put it in different way, the poverty gap or distance that separates the poor from poverty line is on average 7.8% resource of preset poverty line (11145.79 birr) for the study area. That is, on 7.8 percentage of consumption is needed to bring the poor to poverty line.

Finally, the severity index for the study area was 0.0326 that 3.26% fall below the threshold value which implies that inequality among the poorest is moderate for the study area.

Table 8: Incidence, Depth and Severity of Rural poverty status in the study area

Poverty indices	**Study area**
Head count index (α=0)	26.3 %
Poverty gap (α=1)	7.80 %
Squared poverty gap (α=2)	3.26 %

Source: own computation, 2020

4.2.2.1. Poverty status of members and non-members of saving and credit cooperatives (SACCOs) in the study area

Table 9 below indicates the members and non-members comparison of incidence of poverty employing the criteria shows that the proportion of households living in poverty is obviously higher in non-members of SACCOs (27.7) % than members of SACCOs (22.6) %. The results from the survey reveal that the depth of poverty is higher in non-members of SACCOs (8%) than members of SACCOs (6.7%) implying that more resource is required to bring the poor households out of poverty in non-members than members of SACCOs. The results also shows that there is higher (squared poverty gap) degree inequality for non-members of SACCOs (3.4%) than members of SACCOs (2.8%).The overall results of this study indicates that non-members of SACCOs are poorer than members of SACCOs. Therefore, participation in saving and credit cooperatives is essential to fall poverty.

Table 9: FGT measure of poverty status of rural member and non-members of SACCOs in the study area

Poverty indices	**Members(n=97)**	**Non-members (n=234)**
Head count index (α=0)	22.6% (n=22)	27.7% (n=65)
Poverty gap (α=1)	6.7%	8%
Squared poverty gap (α=2)	2.8%	3.4%

Source: own computation, 2020

4.2.3. Food and non-food expenditure of sample rural households in the study area

Analysis of the sample HH's expenditure on food items revealed that the non-members of SACCO spend significantly less on most food items than members of SACCOs. As shown in the table 10 below, the mean differences in food items were observed between the two groups' especially on sugar, edible oil and fat and coffee/tea at 1% significance level, this happens due to difference in capability of buying high food price increase in all food items. Other food items like milk, Enset (kocho), taro and vegetables have created significance difference at 5% between the two groups and also cereals have created significance difference at 10% between two groups

because of the same reason. The mean difference in food expenditure per adult equivalent (for meat and salt) between the members and non-members groups is not statistically significant.

The mean differences in almost all non-food items were observed between the two groups' were statistically significant at 1% probability level except health care which was significance difference at 10% probability level between two groups.

Accordingly, as it is portrayed in table 10 below in terms of the overall food and non-food expenditures per adult equivalent, there is a significant difference between the members and non-members of SACCO groups of the sample rural HHs at less than 1% probability level indicating that the overall consumption expenditure were significantly lower for the non-members than the members.

Table 10: Consumption expenditures of food and non-food items for lowest income quartile sample households

Food items	**Members**		**Non-members**		t-value
	Mean	SD	Mean	SD	
Cereal	3127.3918	450.94	3022.51	520.61	-1.733(0.084)*
Milk	1851.7419	309.11	1740.28	308.82	-2.988(0.0012)**
Sugar	555.09	117.24	497.20	115.39	-4.135(0.000)***
Meat	1123.94	147.6	1098.49	215.67	-1.063(0.288)
Oil & fat	220.11	30.04	210.57	32.16	-2.503(0.013)***
Coffee/Tea	121.28	14.84	116.67	15.43	-2.505(0.012)***
Enset (*kocho)*	157.2784	9.42	153.78	9.14	-3.138(0.002)**
Taro	101.10	8.26	98.10	8.23	-3.007(0.0028)**
Salt	23.28	2.18	23.02	2.10	-1.028(0.305)
Vegetables	132.14	17.99	125.50	18.26	-3.025(0.0027)**
Non-Food items					
Health care	496.18	67.55	480.64	72.67	-1.807(0.072)*
Clothing and foot wear	1325.74	481.72	865.92	333.32	-9.952(0.000) ***
Schooling and stationary	754.96	57.53	701.39	73.43	-6.414(0.000) ***
Social and religious	548.85	76.56	520.11	51.58	-3.969(0.001) ***
Land tax	320.49	56.11	253.99	46.58	-11.113(0.000) ***
Transport	657.17	67.13	621.20	58.09	-4.893(0.000) ***
Kerosene	274.56	62.21	232.22	44.46	-6.971(0.000) ***

Source: Own survey result 2020

***,* *and * Significant at 1, 5 and 10% probability level respectively

4.3. Econometrics results

Under this section, the determinants of participation in SACCOs and its impact were identified. The objectives can be addressed by using the steps of Propensity Score Matching (PSM) results. The main objective of the econometric propensity score matching analysis was to find out the net impact of SACCOs on rural households poverty reduction. In this process, the following sub-sections explain the propensity score, defining common support region, choosing matching algorism, testing matching quality, calculating average treatment effect on treated and sensitivity analysis.

4.3.1. Propensity score

This part presents the results of the logistic regression model that can be used to estimate propensity scores to match member of SACCOs households with non-member households. As indicated in the previous section, the dependent variable in this model is a binary variable indicating whether the household was member of SACCOs or not.

In the estimation, data from the two groups; namely member of SACCOs and non-member households were pooled together such that the dependent variable takes a value of 1 if the household was member of SACCOs and 0 otherwise and then fitted to logit model.

Multi-co linearity test: - Before proceeding into impact estimation Variance Inflation Factor (VIF) was used to test for the presence of multicollinearity problem among the continuous explanatory variables and Contingency Coefficient (CC) was seen for dummy variables. Both VIF (in Appendix table 4.4) and CC (in Appendix table 4.3) of their results (mean value 1.12) and <0.75 respectively showed that there was no serious multicollinearity problem detected. Therefore, there was no explanatory variable dropped from the estimation model.

4.3.1.1. Logit estimate for factors affecting SACCOs membership

Results presented in table 11 showed that the estimated logit model appeared to perform well for the intended matching exercise.

The results of table 11 indicated that both members of SACCOs and non-members of SACCOs household heads have statistically significant difference on sex, education level, farm land size, training, dividend paid, road distance and participation in other financial institutions before matching.

Sex*:* Sex of rural households is a factor that affects the members' participation in SACCOs in the study area. The result of the binary logistic regression analysis revealed that this variable was found to be statistically significant at 1% probability level and influences the rural households' participation in SACCO positively. The marginal effect of sex indicated that keeping other variables constant, a sex of rural households' heads to be male their probability of membership to SACCOs would increase by factor of 17.9%. This implies that males were more members of SACCOs than their counter parts. Moreover, key informant interview reveals that this could be due to many socio-cultural factors that affect female headed households and male headed households might have freedom to mobility and access to information on SACCOs than female headed households. This finding is consistent with the study of Birhanu (2018) who reveals that the household headed by male has positively influence rural households participation in SACCOs.

Educational Level: Table 11 portrays that educational level has positive and significant effect on members' participation in SACCOs. The educational level is found to be significant at less than 1% probability level. The marginal effect of educational level indicated that as education (year of schooling) of the rural households' increases by one year, the probability of membership to SACCOs would increases by 3.2%, keeping other variables constant. This indicated that education level of the rural households enables to have more knowledge and awareness about the advantages of saving and credit cooperatives. This study in line with Amine (2016) and Birhanu (2018) found that increase in the number of years of schooling had a positive effect on rural households' participation in SACCOs and concluded that education promotes participation in microcredit in general.

Farm land size:-The size of the land holding has a positive and significant effect on the probability of membership at less than 1% probability level of significance. The marginal effect of farm land size indicated that as the size of land increases in one ha, the probability of being member to SACCOs would increase by 19.5 %, other variables keep constant. This is reasonable, because larger farms are not only wealthier but also have a higher capacity to expand agricultural production that in turn forces the farmer to join cooperatives to sell the product and to access farm input easily. This finding is in line with Musa and Hiwot, 2017 which found that the size of the land holding has a positive and significant effect on the probability of membership to agricultural cooperatives.

Access to training: - It is one factor that affects the rural households' participation in SACCOs in the study area. As expected, access to training was found to be positively and significantly associated with the rural households' membership in SACCOs at less than 5% probability level of significance. From the results of marginal effect, it can be interpreted as the marginal effect estimates of access to training shows that keeping other variables constant, a one unit increase in the training access, increases farmers' probability of membership to SACCOs by 28%.This shows that it is always of immense importance to deploy awareness creation trainings, follow ups and supports in association to credit and saving. This study results is in line with Berhane (2010) who found that access to training would have positive impact on the decision of farmers to join SACCOs to save.

Dividend paid: - It is one of the factors that affect the rural households' participation in SACCOs in the study area. Dividend paid was found to be positively and significantly associated with the rural households' membership status at 1% probability level of significance. From the results of marginal effect, it can be interpreted as the marginal effect estimates of dividend paid shows that keeping other variables constant, a one unit increase in the dividend paid, increases rural households probability of membership to SACCOs by 13.01%. Key informant interview state that the payment of dividends to members is a major factor in attracting new members and increasing the willingness of old members to save and borrow through the cooperative.

Road distance to cooperative office:-Road distance has a negative and significant effect on the probability of membership at less than 5% probability level of significance. The marginal effect

of road distance indicated that as the distance of road to cooperative office increases in one Km, the probability of being membership to SACCOs would decrease by 6.18 %, other variables keep constant. This is justifiable because when the cooperative office is close to the household head, the cost of time and labor that the rural households spends to communicate with cooperative officers will be reduced. This study result regarding to road distance was consistent with findings of Musa and Hiwot (2017) and Zemen (2014) who revealed that the farther the distance between the rural poor member and the SACCOs office would lead to less interaction and limited saving in a SACCOs.

Participation in other financial institutions: - Participation in other financial institutions was found to be a determinant factor for the rural households' participation in saving and credit cooperatives. Participation in other financial institutions was found to be negative and statistically significant at less than 1% probability level. The marginal effect estimates of participation in other financial institutions shows that keeping other variables constant, as the rural households participation in other financial institutions increases in one unit, the probability of being membership to SACCOs would decrease by a factor of 37.32 %.This can be justified as if members use another alternative financial institutions that provides similar service to the SACCOs, it becomes a competitor and decreases the amount of saving in the SACCOs as stated by Key informant interviews. This result is in line with the study of Zemen (2014) who found that participation in other financial institutions determines the probability of cooperative membership negatively.

Table 12: Logit estimate for factors determining SACCOs membership

Variables	Coef.	Std. Err.	Z	Marginal effect	P>|z|
Sex	1.194	0.367	3.25	0.179832	0.001***
Age	0.0423	0.040	1.03	0 .0069272	0.301
Education level	0.197	0.0487	4.06	0 .0323552	0.000***
Family size	-0.1406	0.1106	-1.27	-0.0230195	0.204
Farm land size	1.1935	0.333	3.57	0.1953953	0.000***
Training	1.7033	0.347	4.90	0.2805299	0.000***
Dependency ratio	0.0899	0.117	0.77	0.0147266	0.442
Dividend paid	0.8392	0.337	2.48	0.1301864	0.013***
Road distance	-0.3779	0.159	-2.37	-0 .0618674	0.018***
Remittance	-0.2243	0.355	-0.63	-0.0357668	0.528
Asset holding	0.00001	0.000036	0.49	2.93e-06	0.621
Participation in other FI	-1.7822	0.413	-4.31	-0.373202	0.000**
Livestock holding in TLU	0.0475	0.127	0.37	0.0077833	0.709
Constant	-7.053	2.304	-3.06		0.002
LR $Chi^2(13)$	136.27	Pseudo R^2	0.3403		
Prob > Chi^2	0.000	Number of obs	331		
Log likelihood	-132.075				
Pseudo R^2	0.3403				
Number of obs	331`				

Source*:* Computed from own survey, 2020

** = Coefficient significant at 5% and *** = Coefficient significant at 1%

4.3.1.2. Matching estimates of propensity score

Since one of the main assumptions of the propensity score was balancing the observable covariates across the observation based on the overlapping and common supporting region, the researcher

analyzed the distribution of estimated propensity score and distribution of propensity score in the common support. The results are presented in table 12 and figure 3 respectively.

As shown in table 12, the estimated propensity scores vary between 0.02256 and 0.991359 with mean of 0.57438 for members of SACCOs or treatment households and between 0.001939 and 0.859929 with mean of 0.1764311 for non-members of SACCOs or control households. The common support region would then lie between 0.02256 and 0.859929. In other words, households whose estimated propensity scores are less than 0.02256 and greater than 0.859929 are not considered for the matching exercise and discarded from analysis since it is out of common support region .i.e. twenty two samples were discarded from treated group.

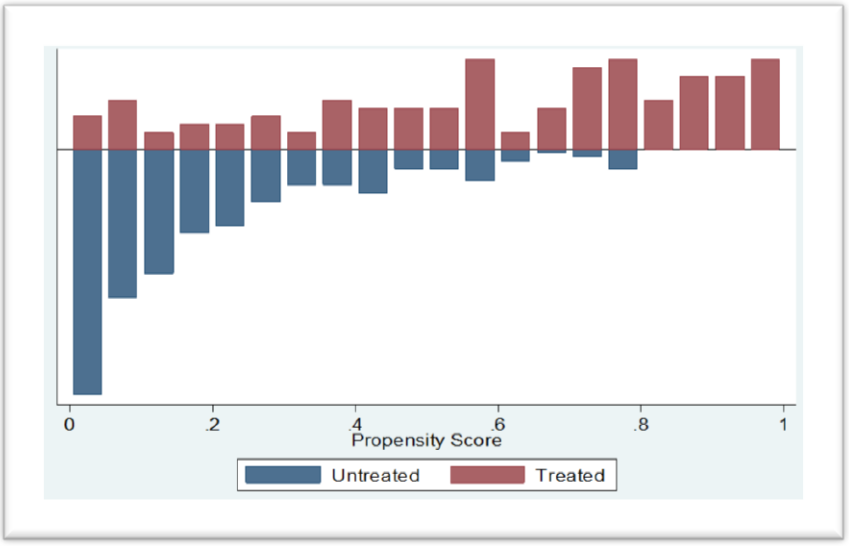
Table 13: Distribution of estimated propensity scores

Groups	Obs	Mean	Std.Dev.	Min	Max
Total groups	331	0.2930514	0.28443	0.001913	0.991359
Members of saving and credit cooperatives	97	0.57438	0.29257	0.02256	0.991359
Non-members of saving and credit cooperatives	234	0.1764311	0.180845	0.001939	0.859929

Source: Computed from own survey, 2020

4.3.1.2.1. Distribution of propensity score in the common support

The results of Figure 3 portray that a visual observation of the density distribution of the household heads with respect to estimated propensity score for the two groups of the common support. In case of treated groups, most household heads are found in partly the middle and partly in the right side of the distribution. On the other hand, most of control households are partly found in the center and partly in the left side of the distribution.



Source: Computed from own survey, 2020

Figure 3: Distribution of propensity score in the common support

4.3.1.3. Choice of matching algorism

Different alternatives of matching estimators such as Radius, Kernel, and Nearest Neighbor were conducted to match the members of SACCO and non- members of SACCO groups which fall in the common support region. The decision on the final choice of the best matching estimator was guided by three criteria namely: Equal mean test (i.e., results in insignificant mean differences between the two groups), looking in to low pseudo-R^2 value and matching estimator that results in the largest number of matched sample size is preferred as suggested by Caliendo and Kopeining (2008) Accordingly, different matching algorisms were presented in table 13. *Number of explanatory variables with no statistically significant mean differences between the matched groups of member and non-member households.

According to Caliendo and Kopeining (2008), a matching estimator that balances all explanatory variables, lowest pseudo-R2 value and large matched sample size is preferable. Therefore, looking into the result of the matching quality in table 13, kernel matching estimator with band width of 0.25 was found to be the best for the data. Hence, the estimation results and discussion for this study are the direct outcomes of the kernel matching estimator with band width of 0.25.

Table 14: Matching performance of different estimators

Matching Estimators	Performance Criteria		
	Balancing test*	Psedo-R^2	Matched Sample Size
Nearest Neighbor Matching			
1 Neighbor	11	0.066	309
2 Neighbor	11	0.042	309
3 Neighbor	13	0.042	309
4 Neighbor	7	0.056	307
Radius/Caliper Matching			
0.1	7	0.257	309
0.25	7	0.257	309
0.5	7	0.257	309
Kernel Matching			
Band width of 0.1	12	0.024	309
Band width of 0.25	**13**	**0.021**	**309**
Band width of 0.5	12	0.065	309

Source: Computed from own survey, 2020

4.3.1.4. Testing the balance of propensity score and covariates

Once the best performing matching algorithm is chosen, the next task is checking the balancing of propensity score and covariate using different procedures as follows

Table 15: Balancing properties of covariates in treated and control groups

Variable	Unmatched	Mean		% reduct		t-test	
	Matched	Treated	Control	%bias	|bias|	t	p>|t|
Sex	Before matching	0.80412	0.1764	56.9		4.51	0.000
	After matching	0.8	0.7768	5.1	91.0	0.35	0.730
Age	Before matching	38.186	38.637	13.6		1.13	0.261
	After matching	38.827	38.505	8.0	41.4	0.52	0.606
Education	Before matching	5.0928	3.294	56.8		4.67	0. 000
	After matching	4.6267	4.704	-2.4	95.7	-0.14	0.886
Family size	Before matching	4.5361	4.7906	-16.7		-1.37	0.172
	After matching	4.6133	4.5026	7.3	56.5	0.48	0.635
Farm land size	Before matching	1.2431	0.9881	51.5		4.39	0.000
	After matching	1.1995	1.176	4.7	90.8	0.28	0.781
Training	Before matching	0.71134	0.4017	65.4		5.33	0.000
	After matching	0.6533	0.5778	15.9	75.6	0.95	0.346
Dependency ratio	Before matching	2.6701	2.517	12.1		0.96	0.338
	After matching	2.6533	2.623	2.3	80.8	0.14	0.892
Dividend paid	Before matching	0.731	0.5598	36.5		2.95	0.003
	After matching	0.693	0.6161	16.4	55.1	0.99	0.323
Distance	Before matching	1.3484	2.0465	-63.1		-4.89	0.000
	After matching	1.494	1.6802	-16.8	73.4	- 1.16	0.247
Remittance received	Before matching	0.309	0.294	3.1		0.26	0.795
	After matching	0.306	0.263	9.3	-198.6	0.58	0.563
Asset holding	Before matching	27561	27156	9.9		0.79	0.428
	After matching	27527	27316	5.2	47.8	0.29	0.770
Participation in other	Before matching	0.6494	0.914	-67.5		-6.27	0.000
financial institutions	After matching	0.8	0.758	10.6	84.3	0.61	0.543
Livestock holding	Before matching	2.3843	2.039	27.0		2.20	0.38
	After matching	2.2748	2.269	0.4	98.6	0.02	0.982

Source: Computed from own survey, 2020

The balancing powers of the estimations are ensured by different testing methods. Reduction in the mean standardized bias between the matched and unmatched groups of the variables used is employed here. The fifth and sixth columns of Table 14 show the standardized bias before and after matching, and the total bias reduction obtained by the matching procedure respectively. The

standardized difference in covariates before matching is in the range of 3.1 % and 67.5 % in absolute value whereas the remaining standardized difference of covariates lies between 0.4 % and 16.8 % in absolute value after matching standardized bias. According to Caliendo and Kopeinig (2008), if SB is reduced to below 5% after matching, the matching method is considered effective in balancing the distributions of the covariate. In order to have the same distribution in explanatory variables Xi after matching, the pseodo-R2 should be low and the likelihood ratio should be insignificant. This result clearly implies that the purpose of matching is to balance the observable characteristics in the treated and control groups. The process of matching creates a high degree of covariate balance between the treatment and control samples that are ready to use in the estimation procedure. Similarly, t-values revealed that all of the covariates became insignificant after matching while seven of them were significant before matching.

Table 16: Matching quality indicators by kernel based matching estimator with band width of 0.25

Sample	Pseudo R^2	LRchi^2	p> chi^2	Mean Bias reduction
Before matching	0.347	138.75	0.000	44.0
After matching	0.021	4.42	8.5	7.6

Source: Computed from own survey, 2020

As presented in Table 15, the standardized mean bias difference for overall covariates used in the propensity score was around 44.0 % before matching is reduced to about 7.6 % after matching which is below the critical level of 20% suggested by Rosenbaum and Rubin (1983). In addition, the results of pseudo R^2 dropped significantly from 34.7% before matching to about 2.1% after matching ensuring that there were no systematic differences in the covariates between both groups. Therefore, all of the above tests suggest that the matching algorithm that has been chosen is relatively best with the data at hand. Accordingly, ATT for households was estimated.

4.3.1.5. Estimating average treatment effect on the treated

In order to attain the above stated third objective the following impact indicator of the treatment effect were performed using the PSM model.

4.3.1.5.1. Impact estimate of saving and credit cooperatives on households poverty reduction (annual expenditure and annual income)

Table 17: Average treatment effects on treated (ATT) for expenditure and income

Outcome variables		Treated	Controls	Difference	S.E.	T-stat
Total expenditure	Unmatched	13537.26	12758.35	778.9	294.99	2.64
	ATT for expenditure	13139.86	12904.83	235.03	433.97	0.54**
Total income	Unmatched	14626.71	13412.24	1214.46	368.69	3.29
	ATT for income	14482.29	13694.54	787.74	516.14	1.53*

Source: Computed from own survey, 2020 ***Note:*** * significant at 10%, ** significant at 5%

The average expenditure of saving and credit cooperative members (*M*= 13537.26) was greater than non- members (*M*=12758.35). This difference also statistically significant (t = 2.64, p<0.01). This showed that saving and credit cooperative members have greater expenditure than non-members of saving and credit cooperative before matched. The result of table 16 showed that after matching, the average expenditure for saving and credit cooperative members was 13139.86 Birr, while the corresponding figure for non- members was 12904.83 Birr. This indicates that saving and credit cooperatives increased the amount of expenditure for saving and credit cooperative members' households by 235.03 Birr. The difference is statistically significant at 1% probability level.

The information obtained from key informant and focus group discussion was also support this positive and significant finding. This shows that saving and credit cooperative membership has a significant impact on increasing the amount of expenditure in the study area.

The average income of saving and credit cooperative members (*M*= 14626.71) was greater than non- members (*M*=13412.24). This difference also statistically significant (t = 3.29, p<0.01). This showed that saving and credit cooperative members have greater income than non-members of saving and credit cooperative. The result of table 16 showed that after matching, the average income for saving and credit cooperative members was 14482.29 Birr, while the corresponding figure for non- members was 13694.54 Birr. This indicates that saving and credit

cooperatives increased the amount of income for saving and credit cooperative members' households by 787.74 Birr. Moreover, the difference is statistically significant at 10% probability level

4.3.1.6. Sensitivity analysis

The final task in PSM is conducting a sensitivity analysis and it is used to check the robustness of the estimation. It is true that relevant but omitted variables can cause bias in the outcome of an intervention. However, this bias can be checked using sensitivity analysis (Caliendo & Kopeinig, 2008). The basic question to be answered here is that whether inference about treatment effects may be affected by unobserved factors (hidden bias) or not. To answer this question, a sensitivity analysis was conducted using Rosenbaum bounding approach for significant outcome variables such as expenditure and income. Table 17 indicates the result.

As observed in table 17 shows the outcome variable which bear statistical differences between member of saving and credit cooperative households and non- member in impact estimate. The rest of the values which correspond to each row of the significant outcome variables are p-critical values at different critical values of e^{γ}. The results show that inference for the impact of saving and credit cooperative does not change, even though the member of saving and credit cooperative households and non- member were allowed to differ in their odds of being treated up to 350% (e^{γ}=3.5) in terms of unobserved covariates. That means for outcome variables estimated, at various level of critical value of e^{γ}, the p-critical values are significant which further indicate that the study has considered important covariates that affected both members of saving and credit cooperative and outcome variables. Thus, it is possible to conclude that impact estimates (ATT) of this study for each outcome variables was insensitive to unobserved selection bias.

Table 18: Results of sensitivity analysis using rosenbaum bounding approach

Outcome variable	Upper bounds on the significance level for different values of e^{γ}					
	e^{γ}=1	e^{γ}= 1.5	e^{γ}=2	e^{γ}= 2.5	e^{γ}= 3	e^{γ}= 3.5
Annual expenditure	0.000013	0.000016	0.000025	0.00003	0.0000034	0.000045
Annual income	0.000014	0.000018	0.00021	0.000031	0.000042	0.000051

Source: Computed from own survey, 2020

***Note*:** Gamma (e^{γ}) = log odds of differential due to unobserved factors where Wilcoxon significance level for each significant outcome variable is calculated

4.4. Results of focus group discussions

The focus group discussions were made in each kebeles by which a group of eight, nine and ten members of groups in Lesho, Lada and Zegoba respectively. A total number of twenty seven members of group discussion were made in all three Kebeles. The group was made of both members and non-members of saving and credit cooperatives in each Kebele i.e. fourteen members and thirteen non-members. The discussions were made on the issues of factors that affect participation in saving and credit cooperatives, impact of SACCOs on rural poverty reduction and general problems regarding on performance of SACCOs. The results of focus group discussions were followed in subtitles.

4.4.1. Discussion on impact of SACCOs on poverty reduction

The discussion on impact of SACCOs on poverty reduction was employed with members of saving and credit cooperatives in each Kebele by which a total number of fourteen members i.e. four, five, and five in Lesho, Lada and Zegoba respectively.

Regarding on the improvement of life standard among their family majority of the SACCOs members FGD participants agreed that:

As one member of Lada Bereket SACCO (female age 37) said:

"As *we have being membership of this SACCOs institutions our living standard have improved in good manner for instance we are educating our children from elementary school to higher education level, we were engaged in income generating activities such as petty trade and others. In addition to that our income and expenditures were improved as we have being membership of this institution. Therefore in terms of reducing poverty, SACCO had significant impact on our living standard".*

A member of Lergede SACCO (male aged 54) said:

"Through cooperatives we have got good knowledge about the benefit of diversifying our income sources, changing saving behavior and home management. It was our big school even though we were forced to do many things that we didn't like"

Generally, no one was reflected negative view on impact of SACCO on poverty reduction.

4.4.2. Discussion on determinants of participation in SACCO

On this subtitle both members and non-members of saving and credit cooperatives were participated. There were many factors that affect participation in saving and credit cooperatives listed by focus group participants. Among those factors the major factors were discussed below.

Regarding on training and education, the members of SACCOs reacted that:
A member of Gotogenet SACCO (male aged 38) said:

"Training and education are major factors that affect our membership. Initially the woreda cooperative facilitators gave us training about the benefit of SACCOs. Then interested members established a SACCO with support from the cooperative specialist."

In addition to FGD on the issues of training and education, participants of key informant interview (Woreda cooperative specialists) stated that,

A head of Kachabira Woreda cooperative office (male aged 45) said:

"In rural Ethiopia there are very limited schools for adult farmers. Majority of the population are illiterate. Cooperatives can teach rural poor how to democratically solve their problems and through cooperative strong local leadership can emerge. The benefit of training and education to rural Ethiopia is more than assuring efficient and sustainable management of cooperative."

Based on this reason one can generalize that proper training can promote membership. A negative image of cooperatives can be addressed only through proper training and showing the practical benefits of cooperatives. Moreover, majority of FGD participants acknowledged that cooperative training can widen their overall know how.

Non-members stressed the lack of information/training before about the importance of the SACCOs as the basic reason why they were not a member of a SACCOs. Therefore they reacted on these issues like:

A farmer near Lada Bereket SACCO (female aged 35) said:

"No one tells us the benefits of SACCOs, which is why we didn't join it.

"We are illiterate; we don't know anything about SACCOs. Now we know more about its benefits, we will join it soon."

Some of FGD participants focused on their access to saving and credit services from other deposit taking microfinance institutions. They reveal that:

A farmer near Gotogenet SACCO (male aged 43) said:

"We aren't involved in the saving and credit cooperatives because some of us are already customers of Omo microfinance and vision microfinance institutions."

5. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter gives the reader the summary, conclusions and recommendations of the study based on research findings and analysis done.

5.1. Summary and Conclusions

Poverty is a rural phenomenon as about 75% of the total world's poor people are living in rural areas**.** Microfinance institutions especially saving and credit cooperatives have been proved in reducing poverty. However, the impact of these institutions in improving living standard of rural households was less understood in the study area. This study was thus initiated to assess the impact of the SACCO on rural households' poverty in Kachabira woreda of Kembata Tembaro zone, Southern Ethiopia.

To meet the objectives of the study, both quantitative and qualitative methods had been employed. The approach used was non-experimental where members of SACCO as one group were compared with non- members of SACCO. Multi stages sampling procedure was used to select the sample households. A total of 331 sample households of whom 97 and 234 members and non-members of SACCO, respectively, were selected using simple random sampling with probability proportional to size from three purposively selected sample Kebeles. Households' income, expenditure and other data considered to be relevant were collected, organized, analyzed and interpreted to come with possible results. The analysis employed both descriptive statistics and econometric methods. Sections below provide brief findings and conclusions of this study.

The sample households were classified into poor and non-poor groups based on expenditure value of meeting recommended daily food requirement of 2200 kcal per day. Accordingly, the cost of basic need approach poverty line which was constructed based on data from the lowest income quartile was 11145.79 ETB per adult equivalent (AE) per year. This line was used as a threshold in which below values were poor and non-poor otherwise. To measure poverty status, FGT model was employed. Accordingly, The FGT results shows the proportion of households with an average total expenditure per AE, which is less than the minimum level, is 26.3 % which states poverty head count, 7.84% poverty gap and 3.26% poverty square gap.

Results of the analysis of hypothesized variables using test statistics indicate that sex of household head, education level of household head, farm size, training, dividend paid and livestock holding found to be significant and positively related to households' participation in SACCO and road distance to SACCO and participation in other financial institutions were statistically significant but negatively related to households' participation in the SACCO.

Similarly, the result of the binary logit model revealed that out of thirteen variables included in the model, seven explanatory variables were found to be significant of which five variables: sex of household head, education level of household head, farm size, training, and dividend paid were influenced rural households' participation in the SACCO positively and road distance to SACCO and participation in other financial institutions are statistically significant but negatively affected rural households' participation in the SACCO.

Regarding PSM results on impact analysis, the matching result of ATT indicated that saving and credit cooperative had positive and significant impact on rural member households' poverty (income and expenditure in Birr). The total annual income and total annual expenditure for saving and credit cooperative members' households was increased by Birr 787.74 and 235.03 Birr respectively than their counterparts.

In conclusion, the study reveals that, participation in saving and credit cooperatives had statistically positive and significant impact on rural households' poverty reduction (total annual income and total annual expenditure).However there were several factors that affect rural households' participation in SACCOs.

Among significant variables, sex indicated that male headed households were relatively better in participation of saving and credit cooperatives than female headed households. This might be due to many socio-cultural factors and male headed households might have freedom to mobility and access to information on SACCO than female headed households. Concerning education level, providing favorable teaching for rural households can contribute towards participation in saving and credit cooperatives. Regarding to land size, more land size holding means more cultivation and more possibility of production which in turn increases farm income and leads to saving. Regarding to training, as stated theoretically training, education and information is one of the principle out of seven principles. Dividend paid indicates that the payment of dividends to

members is a major factor in attracting new members and increasing the willingness of old members to save and borrow through the cooperative. Regarding to road distance, when the cooperative office is close to the household head, the cost of time and labor that the rural households spends to communicate with cooperative officers will be reduced.

5.2. Recommendations

Findings of this study and the empirical results reveal that participation in saving and credit cooperatives increases income and expenditure of rural member households which results reducing the rural households' poverty. However some factors were affect rural households participation in SACCOs. Accordingly, the following recommendations were forwarded.

- In this study, there were differences in sex (male and female headed households) in the participation of SACCO. Therefore, attention should be given for accessing and empowering female households by local government (women and children affair, and saving and credit cooperative office) as well as NGOs.
- This study has showed that education had positive and significant impact on participation in saving and credit cooperatives. Therefore, Ethiopian ministry of education must take this in to consideration and provide effective education program for rural household heads through local government, at least adult education to enhance rural households' participation in SACCO.
- As indicated in this study, farm land size was an important factor to affect rural households' participation in saving and credit cooperatives positively and significantly. Therefore, farmers should be aware and advised by concerned bodies (Woreda agriculture and natural resource management office) to increase the small land productivity through intensification (producing more output per unit area) in order to increase their farm income .
- Based on the finding of this study, training was one of the factors that influence rural households' participation in SACCO positively and significantly. Therefore, the training related to contribution of SACCO for poverty reduction should be given to rural households by local government experts (Woreda cooperative office)

- In this study dividend paid was new variable that was not tested in previous studies. This study results dividend paid as statistically significant and positively affects rural households' membership in SACCO. Thus, the Woreda cooperative office audit experts should prepare audit reports for each SACCOs per year in order to pay dividend or shift it in to captal.
- Regarding to road distance to SACCO office, it was statistically significant but negative effect on participation of rural households in SACCO. Therefore, the Woreda cooperative office should address SACCO branch offices in the remaining portions of the woreda to simplify households' easy access to the institution in order to save and get loan easily.
- Based on this study, participation in other financial institutions such as OMO microfinance and vision fund microfinance was statistically significant but it affects rural households' membership in SACCO negatively. Therefore, based on percentage of interest rate of the SACCO loan, Woreda cooperative office experts should create awareness to rural households by comparing percentage of interest rate of SACCO with other financial institutions because SACCOs interest rate is less than other financial institutions such as OMO microfinance and vision fund microfinance.

Generally, SACCOs in terms of their crucial role in reducing poverty of rural households, attention should be given by concerned bodies (local government offices such as cooperative office) to strengthen rural households' participation in SACCOs.

Recommendations for further research

It is clear that from existing literature and the researcher' own experience that the study incorporated different demographic, institutional, physical and economic factors that may affect the rural poor's decision to join a SACCO. However, this study didn't incorporate social factors that may affect membership of the cooperative. Therefore, future research should explore these additional factors that may affect membership of rural poor.

Furthermore, this research was not a longitudinal study, so drawing conclusions about impact over time is difficult. Therefore, there is a clear need for further research along this line.

REFERENCES

Addisu, A. (2016). The impact of saving and credit program on socio-economic condition of women in mida Woremo district, north shoa Ethiopia: the case of addis-alem saving and credit union.*Indira Gandhi National Open University school of Rural Revelopment,Addis Ababa, Ethiopia*

Adedayo, A., and Yusuf, O. R. (2004).Cooperatives and Poverty Alleviation in Rural Settlements of Kwara State, Nigeria.*Savanna*, 19(**2**): 123- 131.

Ahimbisibwe, F. (2007).Effects of savings and credit cooperatives (Saccos) on members' savings culture. Case study: Ntungamo district. Uganda. *Cooperative development department.*

Ahmed S, Kaleem, A.(2010).The Quran and poverty alleviation .*A theoretical models for charity-based Islamic microfinance institutions 39(**3**):469-428.*

Aigbokhan, E. (2000). Poverty, Growth and Inequity in Nigeria: A Case Study. AERCResearch Paper 102, *Development policy Centre*, Ibadan, Nigeria.

Amemiya, T. (1981). Qualitative Response Model: A Survey. Journal of Economic Literature. **19**: 1483-1536

Amha, W. (2008).Innovations in the Delivery of Financial Services through the DepositTakingMicrofinance Institutions (MFIs) in Ethiopia. Paper presented at the AFRACA Workshop(July 22-25, 2008) on Innovations in Addressing Rural Finance Challenges in Africa.*Addis Ababa,* Ethiopia

Amine, T. (2016).The Impact of Microfinance on Household Livelihoods: Evidence from Rural Eritrea;A *thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.University of the Western Cape.*

Andrew McLeod.(2006). Types of cooperatives.*Cooperative Starter Series.*

Araya, M.(2010).poverty and income inequality in urban areas:(socio-economic analysis of households in wukro wereda:*Mekelle university College of Business and Economics Department of management*

Bailey,T.(2001). Applying international best practices to South Africa's SACCOs: Published dissertation, South Africa:*De Mont Fort University*.

Bendig, M., Giesbert, L. and Steiner, S. (2009). Savings, credit and insurance: household demand for formal financial services in rural Ghana. *GIGA working papers* no 94.

Berhane, H. (2010). The role of RUSACCOs on the improvement of member's saving behavior in Ganta Afeshum wereda, *Tigray, Ethiopia.*

Birchall, J. (2004).Co-operatives and the Millennium Development Goals, Geneva: ILO.

Birhanu, H. (2018).Impact of Microfinance on Poverty Reduction in Ethiopia: Case of Omo Microfinance in Hosana Town:Department of economics, *Wolaita Sodo University, Ethiopia.*

Brown, T., and Teshome, A. (2007).Implementing policies for chronic poverty in Ethiopia (Report 2008/09). London: *Chronic Poverty Research Center and Overseas Development Institute.*

Caliendo, M. and Kopeinig, S. (2005). Some Practical Guidance for the Implementation of Propensity Score Matching, Discussion Paper No. 1588, University of Cologne.

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. Journal of Economic Surveys, **22**, 31-72.

Calum. (2007).An economic framework for understanding micro-credit in developing countries. Paper prepared for presentation at AAEA annual meeting, *Portland Oregon*, July 29-August 2, 2007

Carter, Michael R. and Christopher B. Barrett. (2006). "The Economics of Poverty Trapsand Persistent Poverty: An Asset-Based Approach." *Journal of Development Studies* **42**:178-199.

Castellani, D. (2014). Shocks and credit choice in southern Ethiopia.*Agricultural Finance Review*, 74(**1**):87-114.

Central Intelligence Agency.(2010).*The world fact book*.Retrieved fromhttps://www.cia.gov/library/publications/the-world-factbook/geos/et.html.

Clark, G.C. (1991). An effective strategy for securing sustainable participation of small farmers in rain fed areas. In: Prasad, C. and Das, P. (eds) *Extension strategies for rain fed agriculture*. New Delhi. 142-147. India.

CSA.(2011).Population and Housing Census for 2007. Addis Ababa.

Dagnachew, A. and AddissieSH, .(2009). Law of Public Enterprises and Cooperatives. Addis Ababa: *Justice and Legal System Research Institute*.

David, E. (1970). Poverty theories and income maintenance: *validity and policy relevance, university of Wisconsin.*

Dehejia, R. H. and Wahba Sadek. 2002. Propensity Score Matching Methods for Non-Experimental Causal Studies: The Review of Economics and Statistics, Vol. **84**, No.1, pp. 151–161. *Determination PNAV468.Washington, D.C.*

Demeke, M. (2001).Teaching Material on Research Methodology and Database Management.

Duclos, J., Araar, A., and Giles, J. (2010). Chronic and transient poverty: Measurement and estimation, with evidence from China. *Journal of Development Economics*, 91(**2**).

Dzandu, S. E., and Oosterhout, H. V. (2009).Impact of credit unions on poverty alleviation in selected communities in Ghana.*Canadian Cooperative Association*. Accra, Ghana

Eleuter, A.K.,and Raphael, G.(2015).Impact of Saving and Credit Cooperative Societies in Poverty Reduction Empirical Evidence from Tanzania:*European Journal of Business and Management*www.iiste.org ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) (**7**)23, 2015.

Ethiopian Health and Nutrition Research Institute/EHNRI/, 2000. Kilo calories of different food groups

Fakayode, S.B. and Rahji, M.A.Y. (2009).A multinomial logit analysis of agricultural credit rationing by commercial banks in Nigeria.*International Research Journal of Finance and Economics,* **24**: 90-100.

Federal Cooperative Agency (FCA). (2016).*Cooperative-Annual Magazine – July 2016,* Federal *Cooperative Agency*, Addis Ababa.

Foster, Greer and Thorbecke, (1984). A Class of Decomposable Poverty Measures. Econometrica, Vol.**52**.

Getaneh, G. (2004), "Microfinance Development: Can Impact on Poverty and Food In-Security be Improved upon?", a paper presented for the International Conference on Microfinance Development in Ethiopia, 21-23 January, Bahir Dar, Ethiopia.

Gizachew, A. (2017). Analysis of the Impact of Credit on Smallholder Farmers' Income, Expenditure and Asset Holding in Edja District, *Guraghe Zone, SNNPR, Ethiopia*

Gnigwo, G. (2010). "Factors Affecting Members' Participation in SACCOs in Gambella town, South Western Ethiopia":*Mekelle University.*

Gujarati, D.N., 1995. Basic Econometrics. Third edition. United States of Military Academy,*West Point. 838.*

Gujarati, D.(2004). Basic Econometrics; McGraw-Hill, Inc. 4th edition. New York.

Heckman J, Ichimura H, ToddiP .(1998).Matching as an Econometric EvaluationEstimator. *Rev Econ Stud* **65**: 261-294.

Hosmer Lemeshow (1998) Applied Logistic Regression, 2nd Ed. University of Massachusetts and the Ohio State University, Massachusetts and Columbus http://www.Bu.Cam.Uk/Winbugs/Cont.Shml (Accessed on 27 April, 2017)..

IFAD (2009). Federal Democratic Republic of Ethiopia Country Programme Evaluation: *Document of the International Fund for Agricultural Development*.

IFAD. (2011). Enabling Poor rural People to Overcome Poverty in Pakistan: Rural Poverty in Pakistan. *International Fund for Agricultural Development (IFAD),Rome, Italy*.

International Cooperative Alliance (ICA).(1995).Statement on the Cooperative Identity, *in Review of International Cooperation, (**88**) 3*.

International Cooperatives Alliance.(2014). Cooperatives Identity, Values and Principles.Retrieved from http://www.ica.coop.

Janzen, S.A. and Carter, M.R. (2013). The impact of microinsurance on consumption-smoothing and asset protection: evidence from a drought in Kenya. Selected paper prepared for presentation at the Agricultural & Applied Economics Association's 2013 *AAEA & CAES Joint Annual Meeting*, Washington, D.C.

Johnston Birchall.(2004).Cooperatives and the Millennium Development Goals.*Geneva: International Labor Organization.*

Kachabira Woreda Cooperative Development Office annual report (2019)

Kachabira Woreda Finance and Economic Development Office annual report (2018)

Kernan, S. M. and Ratcliffe, C. (2002) transition events in the dynamics of poverty.USA.US Department of Health and Human Services.*Office of the assistant Secretary of planning and evaluation.*

KHAGRAJ, SH. (2012).Saving and credit co-operative as a poverty Reduction programme: a case study of Rupandehi district, Nepa, 4(**3**):xx.2012.

Kifle, T. (2012).The Impact of Savings and Credit Cooperatives in Ofla Wereda Tigray Region of Ethiopia

King, R.P. and Ortmann, G.F. (2007).Agricultural cooperatives I: History, Theory and problems.*Agrekon*, **46**, 40-68

Krishna, A. (2007). Subjective assessments, participatory methods and poverty dynamics: The stages-of-progress method (CPRC Working Paper **93**). London: *Chronic Poverty Research Center.*

Lewis J., Snape D. and Tonkin R. (2014): "Income, Expenditure and Personal Well-being, 2011 to 2012", *ONS publication*

Maliyamkono, L and Mason, H. (2006).The Promise, Ltd. Tema publishers campany.MD, (2009).*Saving and Credit Cooperative Development Report*.

Myrdal, G. (1957). Asian drama, an inquiry into the poverty of nations. *Asian drama, an inquiry into the poverty of nations.*

MDG. (2014). Millenium Development Goal report.

Metalign, A.(2005). Rural Poverty Situation and Determinants: The Case of Kersa Kondality Wereda, South West Shewa, *Master's Thesis, Addis Ababa University*

Meyer B. and Sullivan J. (2013):"Consumption and income inequality and the great recession", *American Economic Review*, 103(**3**)

Ministry of Finance and Economic Development (MOFED). (2012). *Ethiopia's Progress TowardsEradicating Poverty:* An Interim Report on Poverty Analysis Study (2010/11).*Addis Ababa, Ethiopia.*

Ministry of Finance and Economic Development (MOFED). (2017).Ethiopia's Progress Towards Eradicating Poverty Interim Report on 2015/16 Poverty Analysis Study: *National Planning Commission September 2017 Addis Ababa Ethiopia*

Morduch, J., and B., Haley.(2002)."Analysis of the Effects of Microfmance on Poverty. Reduction", *NYU Wagner Working Paper* No. 1014.

Musa, H., and Hiwot, M.(2017). The impact of agricultural cooperatives membership on the wellbeing of smallholder farmers: empirical evidence from eastern Ethiopia*: Agricultural and Food Economics .http://hdl.handle.net/10419/179092*

Nolan, B., and Whelan, C. (1996). Measuring poverty using income and deprivation indicators: *Alternative approaches. Journal of European Social Policy*, 6(3), 225–240.

Nuredin, M.(2015). Role of Cooperatives in Rural Development: the Case of South Nations Nationalities and People Region, *Ethiopia, 3(**4**): 102-108*

Obwanga, S.(2010). Impact of saccos in alleviation of poverty in kenya: *a case of Kisumu county:university of Nairobi.*

Oluwatayo, B. (2009). Towards assuring households' food security in rural Nigeria: Havecooperatives got any place. *Journal of Agricultural Economics and Rural Development*, 2(**1**), 52-60.

Osmani, S.R. (2003). Evolving Views on Poverty Concept, Assessment, and Strategy. *Asiann Development Bank.*

Ravallion, M. (2003). The debate on globalization, poverty and inequality: Why measurement matters. *International Affairs*, 79(**4**), 739–753.

Rio Group. (2006). Expert group on poverty statistics*: Compendium of bestpractices in poverty measurement*.Retrievedfromhttp://www.ibge.gov.br/poverty/pdf/rio-group-compendium.pdf.

Rosenbaum, P. R. (2002), Observational Studies. (2nd Eds) New York: Springer. 375p.

Rosenbaum, P.R. and Rubin, D. (1983). The Central Role of the Propensity Score in Observational Studies for Causal Effects. *Biometrica, **70**: 41-50.*

Rosenbaum, P. R. and D.B., Rubin, (1985). Constructing a Control Group Using Multivariate Matched Sampling Incorporating the Propensity Score. *The American Statistician, 39: 33-38.*

Samuel M, Barnabas K, Charles S, John R.S. Tabuti.S.,(2013).Factors influencing households' participation in the Savings and Credit Cooperative (SACCO) programmes in Uganda.

Sen, A. (1976). An ordinal approach to measurement of poverty. *Econometrica*, ***44***,219–231.

Sen, A.K., (1987). The Standard of Living, Cambridge University Press Sonja Fagernas and Lindsay Wallace (2007): Determinants of Poverty in Sierra Leone, 2003, OverseasDevelopment Institute, *ESAU Working Paper* 19, London.

Sofiya, S. (2018).An expenditure-based approach to poverty in the UK: *financial year ending* 2017.

Spencer, B. (2005). On Comparing Distributions of Poverty Gaps, *Sankhyã: The Indian Journal of Statistics*, Series B, ***54***; 114-126.

Storck, H., Berhanu Adenew, Bezabih Emana, R. Begander and Getu Hailu. (1991).Management strategies for Farming Systems in an Uncertain Environment and Approaches for their Improvement. *Farming Systems and Resource Economics in Tropics, vol. **27**, Wissenschaftsverag Vau Kiel KG, Germany.*

Suri, T. Tschirley, D. Irungu, C. Gitau, R., Kariuki, D. (2008).Rural incomes,inequality and poverty dynamics in Kenya. Egerton University.*Tegemeo institute of agricultural policy.*

Syed, A.H.A. (1991). Integrated Development in Uganda: Kampala: *Desk top Publishing Division Africa Development series* no. vol.**1**.

Tassew, W.,Hoddinott J., Dercon S., (2008). Poverty and income inequality in Ethiopia: 1995/96 –2004/05, *Addis Ababa, Ethiopia*.

Tesfaye, L. (2003). Diversity in livelihoods and farmers strategies in Hararghe highlands,Eastern Ethiopia, University of Pretoria, South Africa.

Tewari, D. (2011). Wealth creation through mass capital mobilization through Cooperative Enterprise. Some lessons for transplanting the Indian experience in South Africa. *Journal of Business Management, **229**; 8980 – 8989*

TezetaK.andDeribe A. (2013). Savings Mobilization through Saving and Credit Cooperatives in Ethiopia: *Performance, Trend, Challenges and the Way Forward*

Tilahun Amede, Stroud, A., and Aune, J.,(2004). Advancing Human Nutrition without degrading land resources through modeling cropping systems in the Ethiopian highlands 140 (crop yield and nutrient composition of major crops grown in Boloso Sore (Areka) and Ginci. Food and Nutrition Bulletin vol **25** no 4. *The United Nations University.*

United Nations .(2009).The Significance of Cooperatives to a World in Crisis, United Nations.Accessed 21/11/2011 <http://www.un.org/ar/events/cooperativesday/pdf.

United Nations. (2011).Building Inclusive Financial Sectors for Dvelopment. *Unioted Nations Publications*, New York,ISBN:9789212042510. 182.

Unwin, T. (2007). No end to poverty. *Journal of Development Studies*, 43(5), 929–953.

Welman, J. and S. Kruger. (2002). Research Methodology: for the Business and Administrative Sciences Second Edition. Cape Town, South Africa, *Oxford University Press Southern frica.*

World Bank. (1996). Taking action for poverty alleviation in Sub-Saharan Africa.*Washington, DC: Author.*

World Bank. (2000). World Development Report 2000/1, Oxford*: Oxford University Press.*

World Bank. (2001): *AttackingPoverty*, World Development Report Washington, D.C.

World Bank (2003). Rural Financial Services: *Implementing the Bank's Strategy to Reach the Rural Poor.* Report No. 26030.

World Bank. (2011). Ethiopia: Toward Poverty Alleviation and a Social Action Program, *Africa Regional Office*

World Bank. (2013). World Development Report 2014: Risk and Opportunity—Managing Risk for Development. *Washington, DC: World Bank.*

World Bank. (2018). Poverty and shared prosperity. World Development Report 2018: *The World Bank 1818 H Street NW, Washington DC* 20433.

World Bank. (2019). World Development Report 2019: *The Changing Nature of Work. Washington, DC: World Bank.*

World Bank Institute, (2005).Introduction to Poverty Analysis; *Poverty Manual, All, JH Revision*

World Vision Ethiopia. (2009).Kachabirra ADP Community Disaster Preparedness Plan, March

Yamane, T. (1967). Statistics, An Introductory Analysis, 2nd Ed., New York: *Harper and Row*.

Zemen.A (2014). The Impact of Saving and Credit Cooperatives on Food Security in the West Amhara Region of Ethiopia .*National University of Ireland.*

APPENDICES

Appendix I

A questionnaire for rural households to collect data on different issues related to impact of SACCOs in rural household poverty reduction.

Dear respondent,

The researcher is **MSc student in department of Rural Development and Agricultural Extension in specialization of Rural Development at Jimma University College of Agriculture and Veterinary Medicine**

He is undertaking his thesis to generate data and information about Impact of saving and credit cooperatives on rural households' poverty reduction. Therefore, you are kindly requested to answer the following question patiently.

Questionnaire ID_____Date of interview_____

Enumerator's Name _____

Kebele Name: 1) Lesho 2) Lada 3) Zegoba

SACCO's Name: 1)Largede 2) Lada bereket 3) Gotogenet

Part I. General information

Code	**Name of HH----------**	**Response**
1	Sex of HH 1.male 0. Female	
2	Age of household head (year)	
3	Education of household head write 0 for no education (year)	
4	Household size (number)	
5	Number of active labor force(from ages >14 to <65 family members)	
6	Number of dependents (ages <14 + >65 family members)	

Part II. Land use and crop production

Code	Items	Response
7	Do you have farm land? 1) Yes 0) No	
8	If yes, What is the total size of your land in hectare or local units	
9	What is the total area of land you cultivated in 2011/12 in ha?	
10	Do you think that your piece of land is enough to support your family? 1. Yes 0. No	
11	If no state your reasons (multiple answers possible) 1. Infertility of land 2. Small size of land 3. Lack of agricultural inputs to increase productivity 4. Large family size 5.Others(specify)	

12	Which type of crop you have been producing dominantly? 1. Cash crops 0. Non cash crops	
13	Which crops you have been producing? 1) Coffee 2) Enset 3) Maize 4) Vegetable 5) Others (specify)_____	

2.1. Income from annual crop production in year 2011 E.C

Crops grown	Code	(Kg/Qt	Code	Amount consumed (Kg/Qt)	Code	Total Amount Sold				
						(Kg/ Qt)	Code	Unit price	Code	Total income (Birr)
Maize	14		20		26		32		38	
Teff	15		21		27		33		39	
Potato	16		22		28		34		40	
Tomato	17		23		29		35		41	
Taro	18		24		30		36		42	
Haricot bean	19		25		31		37		43	

2.2. Income gained from perennial crops in year 2011 E.C

Crops grown	Code	Total harvest (Kg/Qt	Code	Amount consumed (Kg/Qt)	Code	Total Amount Sold				
						(Kg/ Qt)	Code	Unit price	Code	Total income (Birr)
Banana	44		49		54		59		64	
Enset	45		50		55		60		65	
Mango	46		51		56		61		66	
Avocado	47		52		57		62		67	
Sugar cane	48		53		58		63		68	

2.3. Agricultural input use

Code	Agricultural input use	Response
69	Fertilizer (1=Yes and 0=No)	
70	Improved seed(1=Yes and 0=No)	
71	Chemicals (1=Yes and 0=No)	

Part III. Livestock ownership

3.1. Livestock ownership and income earned from livestock in year 2011 E.C

Livestock type	Code	No of livestock owned	Code	No of livestock sold in last month	Code	No of livestock death	Code	Total income
Cow	72		78		84		90	
Oxen	73		79		85		91	
Sheep	74		80		86		92	
Goat	75		81		87		93	

Poultry	76		82		88		94	
Donkey	77		83		89		95	

3.**2. Income from livestock product sale in year 2011 E.C**

Livestock product	Code	Qty sold in the last 12 months	Code	Amount consumed (Kg/Qt)	Code	Income generated(Birr)	Remark
Milk	96		100		104		
Butter	97		101		105		
Cheese	98		102		106		
Egg	99		103		107		

Part IV. Other sources of income

4.1. Income from off farm and non-farm activities in year 2011 E.C

Code	Type of off farm activity	Have you ever participated in activity 1.Yes 0. No	Code	If yes, Income from each activity in the year 2011
108	Daily labor		116	
109	Sale of charcoal		117	
110	Sale of fire wood		118	
111	Sale of grass		119	
112	Rent of land & pack animal		120	
113	Sale of trees		121	
114	Petty trade		122	
115	Remittance		123	

Part V. Saving and credit cooperatives participation (members/nonmembers)

Code	Items	Response
124	Are you the member of SACCO? 1.Yes 0.No	
125	If yes, When did you join SACCO?	
126	If you are a member of SACOs what services have you acquired? 1) Saving 2) Borrowing 3) input supply (credit or cash based) 4) Training	
127	If your answer to question is No what are the reasons 1) No SACCOs in my village 2) Not interested 3) Do not afford membership fee 4) Others	
128	How did you decide to become member of the cooperative society? 1. Self-interested 2.By government bodies 3.By friends 4.others (specify) _____	

129	If yes, Are you happy being member of the cooperative society? 1. Yes 0. No	
130	Does your participation in SACCO contribute for poverty reduction? 1.Yes 0.No	
131	Did you get income generating activity after joining the SACCO? 1. Yes 0. No	
132	How do you compare to your living standard of after cooperative membership? 1. Extremely good 2. Good 3. Normal 4.No any difference	
133	Did you participate in any social responsibility in the past 12 months? 1. Yes 0.No	
134	Participation in other financial institutions can affect your participation in SACCO? 1. Yes 0.No	
135	Have you received training after becoming a member to SACCOs? 1. Yes 0 .No (for members)	
136	Have you received training about SACCOs by cooperative experts? 1. Yes 0. No (for non-members)	
137	How far distance from your home to saving and credit cooperative office?	
138	Is distance affects your participation in SACCOs? 1. Yes 0.No	
139	If dividend is paid at end of each year, can it enhance participation in SACCO"? 1. Yes 0.No	
140	If yes for what purpose did you use?1)For food items 2)For noon food items 3)for agricultural inputs 4)if other specfy	

Part VI. Household Asset ownership

Code	Items	Response	Total estimated birr
141	What type of house do the household owned?		
	1) Mud wall and grass roofed		
	2) Mud wall and iron sheet		
	3) Stone wall mud and grass roofed		
	4) Stone wall mud and iron roofed		
142	Do you own oxen 1)Yes 0) No		
143	Do you own radio Yes 0) No		
144	Do you own mobile phone Yes 0) No		

Part VII. Household Expenditure (Food and Non-food)

7.1. Food expenditure in year 2011 E.C

Food items	Code	Quantity	Code	Expense	Remark

		(Kg/ Quintal)		(Birr)	
Teff	001		021		
Maize	002		022		
Enset (kocho)	003		023		
Taro	004		024		
Potato	005		025		
Wheat	006		026		
Tomato	007		027		
Cabbage	008		028		
Oil	009		029		
Butter	010		030		
Salt	011		031		
Onion	012		032		
Pepper	013		033		
Egg	014		034		
Meat	015		035		
Pasta/Macaroni	016		036		
Lentil	017		037		
Bread flour	018		038		
Spices	019		039		
Haricot bean	020		040		

7.4. Non-food expenditure in year 2011 E.C

Types of non-food items	Code	Expense (Birr) annually	Remark
Clothes (dressing and shoes)	041		
Kerosene	042		
Religious and cultural expenses	043		
Taxes	044		
Medical health	045		
Child educational expenses	047		
Transport cost	048		

Appendix II. Checklist for focus group discussions

1. What are the benefits of SACCOs in your understanding?
2. What are the main factors affecting your saving decisions?
3. How do you compare the interest rate you are asked by the different lending organizations? Compare SACCO with other financial institutions.

Appendix III: Checklist for Key informant interview

1. What are the contributions of saving and credit cooperatives in rural poverty reduction?
2. What the factors affect rural households' participation in SACCOs?
5. What financial services does the SACCO provide?

Appendix IV

Appendix table 4. 1: Adult Equivalent unit

Age	**Sex**	
	Male	**Female**
<10. 0	0.6	0.6
10 to 13	0.9	0.8
14 to 16	1	0.75
17 to 50	1	0.75
> 50	1	0.75

Storck, et al., 1991

Appendix table 4. 2: Tropical Livestock Unit

Animal category	**(TLU)**
Calf	0.25
Donkey (young)	0.35
Heifer	0.75
Ship & Goat	0.13
Cow and Ox	1
Horse	1.1
Donkey (adult)	0.7
Chicken	0.013

Source: Storck, et al., 1991

Appendix table 4. 3: Multi-co linearity test of dummy variables

	Sex	Training	Dividend	Remittance	Participation in other financial institutions
Sex	1.0000				
Training	0.0899	1.0000			
Dividend	-0.0781	-0.2041	1.0000		
Remittance	0.1597	0.7154	-0.1886	1.0000	
Participation in other financial institutions	-0.1236	-0.1148	0.2381	-0.1288	1.0000

Source: Computed from own survey, 2020

Appendix table 4. 4: Multi-co linearity test of continuous variables with VIF

Variable	VIF	1/ VIF
Total income	1.38	0.725162
Total exp	1.38	0.726106
Education	1.07	0.936031
Asset holding	1.04	0.957423
Distance	1.04	0.957778
Dependency ratio	1.04	0.961763
Livestock holding	1.04	0.962584
Family size	1.04	0.963508
Farm size	1.02	0.985166
Mean VIF	1.12	

Source: Computed from own survey, 2020

Figure 1.Sample size determination