



MADDA WALABU UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF DEVELOPMENT ECONOMICS

**THE IMPACTS OF PARTICIPATION IN COMMUNITY
BASED RURAL SAVING AND CREDIT COOPERATIVES ON
WOMEN INCOME: THE CASE OF SINANA WOREDA, BALE
ZONE, OROMIA, ETHIOPIA**

MSc RESEARCH THESIS

BY

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June, 2022 G.C

BALE-ROBE, ETHIOPIA

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SAVING AND CREDIT COOPERATIVES ON WOMEN INCOME: THE
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DECLARATION

I declare that this thesis entitled by “**The Impact of Participation in Community Based Rural Saving and Credit Cooperatives on Women Income: The Case of Sinana Woreda, Bale Zone, Oromia, Ethiopia**” is my own work and that all sources I have used and quoted have been seen in dedicated with complete references.

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As an advisor, I hereby certify that I have read and evaluated this research prepared under my guidance. Therefore, I recommend that it can be submitted as fulfilling the requirement.

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APPROVAL SHEET

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As a member of the Board of Examiners of the Open Defense Examination, we certify that we have read and evaluated this research entitled “*The Impact of Participation in Community Based Rural Saving and Credit Cooperatives on Women Income: The Case of Sinana Woreda, Bale Zone, Oromia, Ethiopia*” which prepared by “Amina Muhammed” and examined the candidate. We recommend that the research be accepted as fulfilling the requirements for the award of the Masters of Science Degree in Development Economics.

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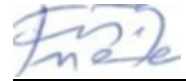
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ABBREVIATIONS AND ACRONYMS

ACSI	Amhara Credit and Saving Institution
ADR	Age Dependency Ratio
ATT	Treatment Effect on Treated
CUP	Cooperative Union Project
DECSI	Dedebit Credit and Saving Institution
GDP	Gross Domestic Product
MFIs	Microfinance Institutions
MoFED	Ministry of Finance and Economic Development
MoTI	Ministry of Trade and Industry
NGO	Non-Governmental Organization
NBE	National Bank of Ethiopia
OCSSCO	Oromia Credit and Saving Share Company
PSM	Propensity Score Matching
ROSCAs	Rotating Savings and Credit Association
RUSACCOs	Rural Saving and Credit Cooperatives
SACCOs	Saving and Credit Cooperatives
TLU	Total Livestock Unit
TGE	Transitional Government of Ethiopia

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ABSTRACT

Community based saving and credit is one of the most powerful tools that contribute to the livelihoods of many rural people through provision of financial and supporting services to the poor. In light of the problems and the research gaps identified, this study was sought to address and generate information on the impact of participation in community based rural saving and credit cooperatives on women total annual income. The study was conducted in Sinana district of Bale zone, Oromia regional state. A total of 378 sample respondents were selected through multi-stage sampling techniques. First, Sinana district was purposefully selected. Then after, a simple random sampling technique was employed to select six Kebeles. Finally, by stratified random sampling technique 378 sample women from the selected six Kebeles were selected. Descriptive statistics and inferential statistics such as frequency, percentage, t-test, chi-square test, logistic regression, and propensity score matching methods were employed for data analysis. The results of the logit regression model identified that family size, distances from rural saving and credit cooperative center and dependency ratio were negatively affected the participation; whereas marital status, education status, participation in training, credit use, and amount of loan borrowed were positively affected women's participation in from rural saving and credit cooperatives. Propensity score matching method was also employed to determine the impacts of membership in from rural saving and credit cooperative on woman income. The estimation result implied that, on average, participation of women in from rural saving and credit cooperative have increased amount of annual income by 9263.94 birr during the survey year. The estimated average treatment effect showed that participation of women in from rural saving and credit cooperative has significant impact on income of participant women with significant t-statistic (25.42) at 1% significance level. The average amount of income of participant women was higher by 61.14% when compared with the average amount of income of non-participant women in the study area during survey year. Therefore, the government in collaboration with the stakeholders of from rural saving and credit cooperative should give more attention in improving rural saving and credit cooperatives in order to develop the participation of women in from rural saving and credit cooperative and enhance their annual income increment in the study area.

Keywords: Participation, Income, Rural Saving and Credit Cooperatives, Impact, Propensity Score Matching.

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

Saving and Credit Cooperatives (RUSACCOs) are likely to be the most viable and sustainable institutions to provide accessible and affordable financial services to the vast majority of urban poor (Aregawi, 2014). They are the main financial solution of the people who have low income level. The RUSACCOs are considered as semi-formal financial institutions, which are not regulated and supervised by NBE. The informal financial system includes Equib, Edir, and others, which are not regulated (NBE annual report, 2009). RUSACCOs Societies or Credit Unions have been developed to meet the fundamental human need to find a way of saving and borrowing methods without taking risks and without handing over too much power to a moneylender (Getachew, 2013). RUSACCOs' core business is mobilizing savings from participants, and then providing them with credit at affordable interest rates (Alecia, Elizabeth, Gideo&Dancan, 2012).

Women empowerment is the ability to make strategic life choices. The ability to exercise one's choice constitutes of three inter-related aspects namely; control over resources, agency or decision-making (women's involvement in crucial household decisions) and achievements (well-being outcomes). In most instances, women get discriminated against making strategic choices that affect their lives. Thus, limiting their social, economic and political choices, the United Nations (UN) acknowledge that investing in the economic empowerment of women directly lead to poverty eradication, gender equality and inclusive growth. Globally, men have more access to saving mechanisms and formal financial institutions than women. Women constitute over 70% of the world's poor with two-thirds of the world' illiterate being the rural women. Target 5a of the SDGs seeks to reinforce reforms for women's rights in economic resources, access, and control over land and financial services and properties (Mercy & Joseph, 2020).

For a long period, fighting poverty has been one of the major agenda of developing agencies including government, NGOs as well as financial institutions in Kenya in order to improve the welfare of the people. As a result, availability and accessibility to reasonable financial services is

significant in economically empowering the low income-earners especially women (Kesanta& Andre, 2015). In many cases, commercial banks and microfinance institutions (MFIs) are the main organizations that are used to provide financial services. Empowering women has been one of the principal topics of discussion in the effort to fight for gender parity in economic development (Kapitsa, 2008). Nevertheless, there is a scarcity of proof in studies on the influence of economically empowered women in third-world countries (Brannen, 2010). Women are most active participants in the perception of village savings therefore, there is a need to examine their participation in savings and how this affects their livelihoods especially in rural economy.

Like other Sub-Saharan African countries, the socio-economic condition of Ethiopia is characterized by low growth rate of income, saving, investment, inadequate social services, high population growth and high unemployment rate. High population growth also causes the natural resource degradation of the country. Poverty and food insecurity are the main challenges and fundamental issues of economic and social development in Ethiopia (Gebrehiwot, 2012).

Access to credit can help rural poor economy through increasing the ability of households to meet their financial needs such as the purchase and use of improved agricultural inputs which are not available from the farm. Further, access to rural credit may increase the households' ability to adopt modern agricultural technologies that increase the income of the small farm holders and breaks poverty cycle(Anyiro & Oriaku, 2011). In developing countries microfinance, 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(Tolossa, 2014).

The study conducted in Cheliya district of Oromia regional state implied that microfinance is one of the most powerful tools that contribute to the livelihoods of many people through provision of financial and supporting services to the poor. In light of the problems and the research gaps identified, this study seeks to address the impact of microfinance services on rural households'

total annual income using a propensity score matching model and the outcome of the propensity score matching estimation indicated that the mean yearly income of participants was greater than that of non-participants. The rosenbaum bounds test also implies that the estimated impact result was not affected by unobserved characteristics. Based on finding result it is suggested that the microfinance institutions and other concerning bodies should work more on increasing rural households' participation in microfinance services to improve the income of participant households in the area (Tadele et al., 2018).

Cooperatives in Ethiopia are governed by the comprehensive and multi-sectorial cooperatives societies' proclamation No. 147/1998. This Proclamation was based on internationally accepted cooperative principles. It laid the ground for the development of all kinds of cooperative societies at different levels, and is comprehensive in its coverage. As per the proclamation No. 147/1998, RUSACCOs were expected to play active role in bringing about broad-based development and poverty alleviation as they were permitted to take deposit from and grant loan to participants. However, this proclamation failed to recognize RUSACCOs as formal financial institutions even though they were allowed to accept deposits and grant loans. As a matter of this fact, RUSACCOs are not subjected to the regulation and supervision by National Banks of Ethiopia (NBE) that other formal financial intermediaries are subjected to. The cooperative proclamation allows RUSACCOs to operate as self-regulated entities with a few restrictions such as the allocation of profits and the maximum shareholding to a single participant. Internal monitoring and controlling generally provides the checks and balances of the operation of the cooperatives (Zerfeshewa, 2010).

In Ethiopia, many microfinance institutions have been introduced and have been working in order to solve the credit access problems of the poor especially to women those participating in the small business. Thus, the main objective of this study will be to examine impacts of community based rural saving and credit cooperatives on women income. The study aimed to employ Propensity Score Matching model to analyze the impact of microfinance on the income of rural women. Research design will be cross-sectional data obtained from both primary and secondary sources. Primary data will be collected through face-to-face personal interviews using structured questionnaires.

1.2. Statement of the Problem

Women are having burden and responsibilities in executing home and field activities. Cleaning the house, buying goods for home consumption, carrying agricultural products to the market, and participation in various agricultural activities like weeding are some of their responsibilities. Despite their share of labor, their work is not valued by the society and the decision to control over income goes to the men. In rural areas, women live in oppressive culture that denies their right to participate in decision making process. Therefore, socioeconomic deprivation of women is characterized by their limited access to resources, services, and employment. As a result, a large number of women are economically dependent on men (Addisu, 2016).

The study conducted by Addisu (2016) in MidaWoremu district of North Shoa general revealed that advancing credit by RUSACCO to community members in the district brought an income impact of ETB 5783 per annum. However, Ethiopian women did not equally benefit from the national development endeavors because their contributions to the economy had not been fully valued (TGE, 1993). Ethiopia remains a highly traditional and religious society in which women are kept in a subordinate position (Gemechu, 2007). Alamirew (2006) reported that microfinance has positive impacts in reducing poverty, penned that considerable findings were drawn on market-oriented micro-financing. Yet the impacts of MFIs on rural women empowerments and socioeconomic aspects are overshadowed. There is still a need of more evidences on the impact of participating in RUSACCOs on the income of women in Sinana district where there is no any research effort to assess the impact of RUSACCOs.

The study conducted by Kebu (2017) on the financial and operational performance of microfinance institutions by using simple descriptive analysis had focused on factors affecting financial performance of microfinance institutions in the study area. However, the study did not say anything about the effect of microfinance services on women income in the study area. Another study conducted by Birhanu (2016) in Cheliya district of Oromia region on the role of microfinance institutions in reduction of unemployment focused on youths' participation in microfinance services by analyzing factors affecting youths' participation in microfinance institutions. The finding result showed that microfinance institutions reduced unemployment by providing loan and saving service. However, this study did not show the impact of microfinance saving and credit on women livelihood. Moreover, in Sinana district there was no observed

evidence that shows whether the incomes of rural women those participated in microfinance services were improved or not. This motivated the researcher to conduct a study on the impact of participation in rural saving and credit on women income.

Even though there have been many studies conducted concerning the impact of microfinance at the country level, a high proportion of them have been focusing on contributions to children's education, improving health outcomes for women and children, poverty reduction and empowering women by participation in microfinance services. Moreover, these studies have compared microfinance beneficiaries against non-beneficiaries on outcome variables of interest using descriptive statistics and observable characteristics without addressing the key methodological issues such as selectivity bias and sensitivity analysis (Amir, 2020). Further, these studies didn't address impact of community based saving and credit on rural women income where majority of the people rural households based subsistence farming system. So, this researcher is aimed to assess the impacts of participation in community based RUSACCOs on women income in Sinana district of Bale zone.

1.3. Objectives

1.3.1.General Objective

The general objective of the study was to examine impact of participation in rural saving and credit cooperatives on women income in Sinana Woreda of Bale zone, Oromia, Ethiopia.

1.3.2.Specific Objectives

The specific objectives of this research were:

1. To identify the factors that affects participation of women in the cooperatives;
2. To measure the impact of participation in RUSACCO on women's income

1.4. Research Questions

The following questions were asked to get information that used for data collection.

1. Which factors significantly affects the participation of women in RUSACCO?
2. Is the income of participant women improved after joining the cooperatives?

1.5. Significance of the Study

This study investigated the impacts of participation in rural saving and credit service on women's income in Sinana Woreda. Information about the impacts of saving and credit service on the socioeconomic status of women has important policy implication. In this regard, the study's findings regarding the role of micro-credit in the economic and financial empowerment of rural women will have significant contribution to development practitioner and policy makers. Besides, this study helps as input for government and NGO's to improve their services in other project areas using the fact from the study.

1.6. Limitation and Scope of the Study

The study is limited to Sinana Woreda and in six primary cooperative groups (saving and credit cooperative societies), in Balezone of Oromia regional state. Activities like membership participation, involvement in decision making and the economic benefit of women after joining in cooperatives are only considered in this research. The research will have undertaken on the specified Woreda and on selective cooperative women group alone. Cooperative societies other than saving and credit are not included. The reason for the study to get confined in this area and nine primary cooperative is due to resource and time constraints.

1.7. Organization of the Study

The first chapter deals with introduction to the research topic, statement of the problem, objectives, research questions, significance of the study, limitation and scope of the study. The second chapter deals with the review of relevant literature. The third chapter deals with the methodology including description of the study area, sources and methods of data collection, sampling techniques and sample size and statistical methods followed. Fourth chapter deals results and discussions. The last chapter includes conclusion and recommendations.

CHAPTER TWO

2. REVIEW OF LITERATURE

2.1. Theoretical Literatures

2.1.1.The Definition of Rural Saving and Credit Cooperative (RUSACCOs)

Saving and Credit Cooperative is a group of people who have common bond, live in the same community or society save money together and lend it to one another at agreed interest rate, time and conditions. Financial co-operatives are commonly known as Saving and Credit Cooperatives (SACCOs) which operate both in urban and rural areas. In the context of Ethiopia, those financial cooperative which are specifically working in rural areas of the country are commonly known as “Rural Saving and Credit Cooperatives (RUSACCOs)”. They are playing a vital role in bringing financial services to the unbanked in rural Ethiopia. RUSACCOs are key drivers in the promotion of financial inclusion and are usually formed through the initiative of the local population, and of course, with additional support coming from government and/or Non-Government Organizations (Mulugeta, 2016).

Saving and Credit Cooperative are also defined as a legal entity established by the voluntary membership of private or public for the purpose of depositing their saving and providing credits to its members. In addition, organizations of saving and Credit Co-operatives in Africa, also defined as, a credit union is a cooperative financial organization owned and operated on a non-profit basis by its member according to democratic principles. Rural Savings and Credit Cooperative is a democratic, unique member driven, self-help co-operative. It is owned, governed and managed by its members who have the same common bond: working for the same employer, labor union, social fraternity or living/working in the same community. A Savings and Credit Co-operative’s membership is open to all who belong to the group, regardless of race, religion, color, and gender or job status. Members elect board that in turn employs staff to carry out the day-to-day activities of the RUSACCO. Members also elect a supervisory committee to perform the function of an internal audit (SACCOL, 2014).

A RUSACCO is a cooperative financial institution that is owned and controlled by its members and operated for the purpose of promoting thrift, providing credit at low interest rates and

providing other financial services to its members (IJCRB, 2013). Saving and credit cooperative societies are different from other micro finance enterprises. In RUSACCOs, the members should save first to get a credit but in micro finance the customers should take the credit and then they can save.

RUSACCO society is a financial institution that purely deals with mobilizing money from members as savings, shares and providing easy accessible loans to members on time. The difference between a RUSACCO and other forms of cooperatives is that the RUSACCO can accept deposits from its members as savings and also issue out loans to qualifying members of the RUSACCOS (Henama, 2012). Through RUSACCO, members can get micro and macro credit to create/start small businesses. The member in RUSACCOs has access to credit as a primary service. RUSACCO members have equivalent opportunity to get access to credit within the cooperatives. Nearly all of males and female members within the RUSACCOs had access to credit. Hence, the participation of males and females in getting access to loans within the RUSACCOs was high. The RUSACCOs also deliver loans to all members without gender discrimination (Dessalew, 2014).

2.1.2. Historical Development of RUSACCOs

The modern history of cooperatives started with the Rochdale Society of Equitable Pioneers, founded in 1844. This was an early consumer co-operative, and one of the first to pay a 8 patronage dividend, forming the basis for the modern cooperative movement. Although other cooperatives preceded them, the Rochdale Pioneers' co-operative became the prototype for societies in Great Britain. The Rochdale Pioneers are most famous for designing the Rochdale Principles, a set of principles of co-operation that provide the foundation for the principles on which cooperatives around the world operate to this day. The model the Rochdale Pioneers used is a focus of study within co-operative economics (Gatuguta et al., 2014).

The Rochdale Society of Equitable Pioneers was a group of 28; around half were weavers in Rochdale, Lancashire, England, that was formed in 1844. As the mechanization of the Industrial Revolution was forcing more and more skilled workers into poverty, these tradesmen decided to band together to open their own store selling food items they could not otherwise afford. With lessons from prior failed attempts at co-operation in mind, they designed the now famous

Rochdale Principles, and over a period of four months they struggled to pool one £1 per person for a total of 28 pounds of capital. On 21 December 1844, they opened their store with a very meager selection of butter, sugar, flour, oatmeal and a few candles. Within three months, they expanded their selection to include tea and tobacco, and they were soon known for providing high quality, unadulterated goods. Ten years later, the British co-operative movement had grown to nearly 1,000 co-operatives (Ibid, 2014).

These consumer cooperatives, which emerged in Britain in the 1840s along the Rochdale system, are today the market leaders in Italy, Switzerland, Singapore and Japan. They are also very active in the Scandinavian countries and Atlantic Canada. In the UK, which has seen the fiercest competition among consumer chains, consumer cooperatives are fifth in market share and are pre-eminent in the small supermarket sector. Consumer co-operatives have a strong record of creating decent work for their employees, engaging in fair trade with producer cooperatives in developing countries, setting industry standards for honest labeling, and promoting healthy diet (The Asia foundation, 2010).

In African countries, the first experiences of savings and credit co-operatives were to a large degree the work of foreign missionaries (Mwelukilwa, 2001). Many of the first savings and 9 credit cooperatives emerged in the English- speaking countries, primarily in Ghana 1955, Uganda 1946 and in Nigeria dates back to 1951-1953. In Tanzania RUSACCOs emerged in 1954, Kenya in 1964, Liberia 1965 (Mbwana&Mwakujonga, 2013).

In Ethiopia, the history of cooperatives goes back to the imperial regime. The first proclamation on cooperatives was issued in 1961 (FCA, 2005). From the limited documents available, it is apparent that few cooperatives were functional in the 1960s and 1970s. These were mainly established by coffee and sesame producers. Also, savings and credit cooperatives (RUSACCOs) were organized by employees of Ethiopian Airlines, the Light and Electric Power Authority, the Commercial Bank, the Highway Authority and Telecommunications. One study indicates that there were about 149 cooperatives in 1974. They consisted of 94 multipurpose cooperatives, 19 RUSACCOs, 19 consumers' cooperatives and 17 handicrafts cooperatives (Lelisa, 2000).

During the military regime cooperatives was viewed as a key instrument to build a socialist economy pursued the cooperatives agenda more aggressively. Large number of cooperatives was

observed during the centrally controlled economy which lasted from 1974 to 1991. The new cooperatives largely focused on savings and credit as well as the supply of government-subsidized consumer supplies and agricultural inputs. According to information from the Ministry of Agriculture (MoA), at the height of the regime there were about 10,524 primary cooperatives with membership of 4,529,259. The formation of cooperatives during this regime was conducted without respecting the principle of voluntary membership. All were organized on the socialist principle of collective farming and all members were required to contribute an equal amount and have an equal share. Moreover, all households under the designated Kebele were required to be members of cooperatives without which certain basic supplies would not have been accessed at affordable prices. The large majority of the cooperatives during this period were providing services to their members only (ILO, 2008).

The present government provided a legal framework which is both comprehensive in many respects (including its ability to accommodate cooperatives in various sectors/sub-sectors) and incorporates universally accepted principles of cooperatives including voluntary membership (Proclamation No. 147/1998 and 402/2004). As a result some improvements have been seen in cooperative societies in the country. Cooperative societies started to distribute inputs, provide loan to their members, market produces of members in the domestic and foreign market, Unions (secondary cooperatives) were formed with the assistance of Cooperative Union Project (CUP) funded by VOCA/Ethiopia/USAID), dividend payments were made by the unions as well as primary cooperatives. The number of Primary and secondary cooperatives of different types with significant increase in number of member beneficiaries is achieved (Kifle, 2015).

2.1.3. Importance of Saving and Credit

RUSACCOs are legally constituted cooperative institutions established, in most cases, under national cooperatives law to meet the basic financial service needs of primary low and middle income citizens who generally cannot obtain these services through the existing banking system. It is well recognized that RUSACCOs provide a means to learn the value of regular saving and wise use of credit. Some even consider them as a form of economic empowerment, where members collectively control and manage their own financial institution which provides saving, credit and financial management services (Galor, 1995).

As a result, RUSACCOs are appreciated for creating an opportunity for people to take responsibility for their own financial organization (RUSACCOL, 2013). RUSACCOs mobilize local resources and return them to members in the form of loans and hence the money stays and works within the members. RUSACCOL in its website listed a number of advantages of RUSACCOs and among these the notable ones are: better interest rate on both saving and loans, low overhead cost compared to banks, encouraging members to save with the objective of economic empowerment and educating members on prudent handling of money (Ibid, 2013).

In RUSACCO each members is not another customers to the cooperative, he/she is rather a member as well as an owner of the cooperative, who even gets a share of the profit in the form of dividends. Savings are mobilized locally from the members and are returned to them in the form of loans and this way the money stays and works within the members. RUSACCOs encourage and educate members to regularly save their money and aim at liberating members from dependence on money lenders and unfriendly banking terms.

2.1.4. Models of Microfinance Interventions

MFIs employ wide variety of implementation methods to reach their clients. These methods are called models of MFI. The Grameen Bank has identified different microfinance models of which Rotating Savings and Credit Association (ROSCAs), the Grameen solidarity group model and the Village Banking models are some of the models common in Ethiopia (Addisu, 2016).

2.1.4.1. Rotating Savings and Credit Associations (ROSCAs)

These are formed when a group of people come together to make regular cyclical contributions to a common fund, which is then given as a lump sum to one member of the group in each cycle (Grameen Bank, 2000). According to Harper (2002), this model is a very common form of savings and credit. He states that the members of the group are usually neighbors and friends, and the group provides an opportunity for social interaction and is very popular with women. They are also called merry-go-rounds or Self-Help Groups (Yunus, 1999). In Ethiopia, Rotating Savings and Credit Associations (ROSCAS) are widespread both in urban and rural areas and are referred to as ‘equb’. Households participate in ‘equbs’ regardless of their race, religion and their socioeconomic status. Particularly, ‘equbs’ are important sources of finance for households who are potentially to be credit constrained.

2.1.4.2. The Grameen Solidarity Group Model

This model is based on group peer pressure whereby loans are made to individuals in groups of four to seven (Yunus, 1999). Group members collectively guarantee loan repayment, and access to subsequent loans is dependent on successful repayment by all group members. Payments are usually made weekly (Ledgerwood, 1999). This model is well-matched with social structures in rural Ethiopia. This is not only because the model builds upon existing social structures of mutual support and communal life, but also because it removes the main entry barriers for the very poor, such as lack of collateral, limited literacy, weak technical knowledge, and little prior money management experience (Getaneh, 2010). MfM project in the study area has adopted this Grameen Bank Solidarity approach, which is group lending approach, by organizing members in groups with 5-10 members and establishes group guarantee system for delivery of micro finance services.

2.1.4.3. NGO Model

NGOs have emerged as a key player in the field of microcredit. They have played the role of intermediary in various dimensions. NGOs have been active in studying and participating in microcredit programs. This includes creating awareness of the importance of microcredit within the community as well as various national and international donor agencies. They have developed resources and tools for communities and microcredit organizations to monitor progress and identify good practices. They have also created opportunities to learn about the principles and practices of microcredit. This includes publications, workshops and seminars and training programs (Srinivas, 2015).

2.1.4.4. Peer Pressure Model

Peer pressure uses moral and other linkages between borrowers and project participants to ensure participation and repayment in microcredit programmes. Peers could be other members in a borrowers group (where, unless the initial borrowers in a group repay, the other members do not receive loans. Hence pressure is put on the initial members to repay); community leaders (usually identified, nurtured and trained by external NGOs); NGOs themselves and their field officers; banks etc. The 'pressure' applied can be in the form of frequent visits to the defaulter,

community meetings where they are identified and requested to comply etc. The Grameen model extensively uses peer pressure to ensure repayment among its borrower groups (Srinivas, 2015).

2.1.4.5. Village Banking Model

Village banks are community-managed credit and savings associations established by NGOs to provide access to financial services, build community self-help groups, and help members accumulate savings (Hulme, 1997). They have been in existence since the mid-1980s. They usually have 25 to 50 members who are low-income individuals seeking to improve their lives through self-employment activities. These members run the bank, elect their own officers, establish their own by-laws, distribute loans to individuals and collect payments and services (Grameen Bank, 2000).

The sponsoring MFI lends loan capital to the village bank, who in turn lend to the members. All members sign a loan agreement with the village bank to offer a collective guarantee. Members are usually requested to save twenty percent of the loan amount per cycle (Ferka, 2011). Members' savings are tied to loan amounts and are used to finance new loans or collective income generating activities and so they stay within the village bank. No interest is paid on savings but members receive a share of profits from the village bank's re-lending activities. Many village banks target women predominantly, as according to Hulme (1997) the model anticipates that female participation in village banks will enhance social status and intra household bargaining power.

2.2. Empirical Literatures

Many studies in different disciplines used different approaches to assess impact. George used PSM in order to assess the effect of microfinance among smallholder farmers in Africa (George, 2009). The main objective here was to assess whether households with credit are better off compared to those without. Results revealed that participation in microfinance credit improves household productive incomes by a range of between USA \$200 to USA\$ 260 in a single production period. Firafis (2016) in his study revealed that loan repayment performance of the borrowers and the screening technique which the institution follows to ration loan to its clients were found to be sound. Moreover, the result of the finding showed that credit scheme has

contributed positively in terms of improving the incomes, access to education, access to health facilities and nutritional status of the borrowers.

The study by Melese (2013) indicated the positive impact of the microfinance on the improvement of household income, consumption, employment opportunities, saving, access to education and medical facilities of program participants. Further, the result of the study indicated that the OCSSCO's micro financing scheme has had positive effect on improving the living standards of its clients using the outcome variables such as income, nutritional status, access to education, medical facilities, saving and employment opportunities (OCSSCO, 2017). The study by Tadele et al. (2018) using a propensity score matching model indicated that the mean yearly income of participants was greater than that of non-participants.

On the other hand, the study done by Taye (2014) indicate that the micro financing program has a positive effect on women's economic empowerment as measured by the increased involvement of women in household decision making. Moreover, analysis result indicated that access to Microfinance has encouraged the economic empowerment of women in terms of improving their business activities and the status of women at family and country level. Similarly, the study under taken by Yilkal (2016) on impact of microcredit programs on female headed households in Jimma Zone showed that more educated households, large land holders and higher income earners participation in microcredit program was low. The study concluded that as a result of microfinance program participation, the annual expenditure of female headed households was increased.

Even though there have been many studies conducted concerning the impact of microfinance at the country level, a high proportion of them have been focusing on contributions to children's education, improving health outcomes for women and children, poverty reduction and empowering women by participation in microfinance services. Moreover, these studies have compared microfinance beneficiaries against non-beneficiaries on outcome variables of interest using descriptive statistics and observable characteristics without addressing the key methodological issues such as selectivity bias and sensitivity analysis. Further, these studies didn't address impact of microfinance on income in rural areas where majority of the people rural households based subsistence farming system. Another study conducted by Birhanu (2012) on the role of microfinance institutions in reduction of unemployment in the study area showed

that microfinance institutions reduced unemployment by providing loan and saving service. However, this study did not show the impact of microfinance credit on its clients' income.

A key component of Ethiopia's development strategy is the establishment of sustainable microfinance institutions serving large numbers of poor people. While non-governmental organization (NGO) credit schemes and informal sources of finance have existed in Ethiopia for many years, the government instituted a legal and policy framework for MFIs in 1996 through Proclamation 40/1996 (Gebrehiwot, 2002). Hence, Microfinance has become a growing sector in Ethiopia.

As of 2013, 33 microfinance institutions are registered with the National Bank of Ethiopia. These institutions serve 3.2 million borrowers with portfolio of Birr 12.9 Billion. The three largest micro finance institutions (namely, Amhara Credit and Saving Institution (ACSI), Dedebit Credit and Saving Institution (DECSI) and Oromia Credit and Saving Share Company (OCSSCO)) accounted for 33 percent, 20 percent and 16 percent of the total assets of all MFIs, respectively (AEMFI, 2015).

A study conducted on the Dedebit Credit and Saving Institution (DECSI); found that DECSI's program has had a positive impact on the livelihoods of its clients. Compared to non-clients, clients have experienced greater improvements in the years (2000 – 2004). Their situation has improved in terms of income, consumption and assets. They also seem to be more food secure and less vulnerable to shocks and have a greater diversification in terms of income sources. The study found that the improvement in economic condition of the clients is a necessary condition for DECSI's program that could lead to social and political empowerment for the marginalized groups. The study also concluded that economic empowerment leads to social and political empowerment.

On the other hand, this study also indicated the negative effects of DECSI's program. A considerable number of credit-financed ventures fail with a possible effect on indebtedness and asset depletion of clients. In addition, a high level of school dropout rates of client's children is registered. This is for a purpose of shepherding animals purchased by program fund (Ferka, 2011).

Tsehay and Mengistu (2002) reported more positive impact of microfinance on poor women in Ethiopia. They concluded that participation resulted in significant increase in household income. Women were said to be able to provide for the basic needs of their families; had control over resources; owned assets; able to cope up with risks; save more for future use; and increase empowerment, among other things. In Amhara Regional state, practice strongly suggests that microfinance indeed has a potential to be one of the key instruments to fight poverty in its every aspect by positively affecting the house-hold economic portfolio. For the poor, it can expand opportunities for enhancing income, improve capabilities in terms of human capital, improve the coping mechanism against vulnerability in its various features, as well as empower the disadvantaged; and the impact can occur at enterprise, individual, household and even community level, much of which being a result of enterprise profitability. Yet, the available evidence suggests little progress in this regard (Getaneh, 2004). Similarly, though credit is generally expected to have a positive impact on household livelihoods, a study conducted in North Gonder, Ebinat district argued that credit affects households differently depending on wealth. Results show that credit failed to enable poor households to move out of poverty and food insecurity, whereas better-off and labour rich households used credit to improve their livelihoods. For poor households, rather than achieving long-term livelihood improvements, access to credit only means short-term consumption smoothing with a risk of being trapped into a cycle of indebtedness (Siyoumet al., 2012). In connection with women's empowerment, Padma, and Getachew (2005) reported positive impacts of microfinance.

The other study was conducted on OMO and SIDAMA micro-finance institutions' women clients in Awassa town, Southern Nations and Nationalities Peoples' Regional State. According to this study, a majority of the clients are involved in the making and trading of food, and foodrelated products. The study also witnessed there is no diversification in their business activity. The reason for this is that the production of food and related items trade involves less risk compared to other activities. The study further found that 92% of them are not very much aware that the savings are more important than credit to build their future. The researchers' explanation 15 of this finding is that MFI's savings policy is only to cover the risk situation rather creating any element of thrift among the clients.

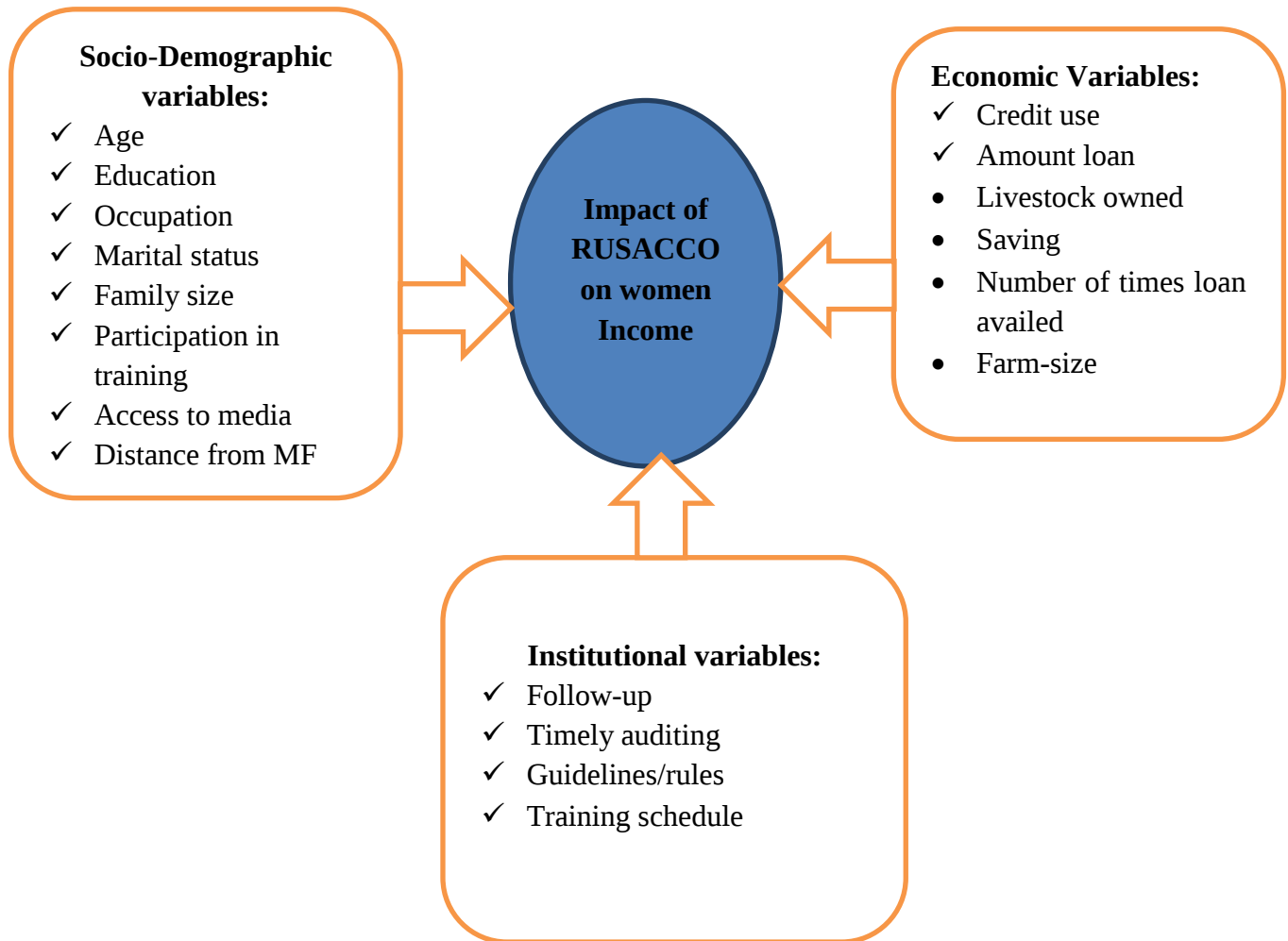
Nevertheless, the study argued that there is a good influence of micro credit on the urban women working groups in terms of income and self-employment generation. Furthermore, it also reflected in many cases in business improvements, decision making process and asset formation at low levels, and it is believed not sufficient (Padma &Getachew, 2004).

After more than ten years of hard work and two international excellence awards, Amhara Credit and Saving Institution (ACSI) is now the leading microfinance institution in Ethiopia. An impact study conducted by the Association of Ethiopian Microfinance Institutions (AEMFI) in 2007 estimated that the institution was responsible for substantial growth in agricultural gross domestic product (GDP) in the Amhara region. According to the study, by the eighth loan cycle clients are able to put poverty permanently behind them, but even by the fifth loan cycle they can significantly improve their living conditions (IFAD, 2007). In addition, other study on ACSI clients found that the percentage of those with assets grew from 67 per cent at the beginning of their relationship with ACSI to 84 percent among the mature clients (IFAD, 2011).

To sum up, microfinance has been carried out to alleviate poverty by connecting the poor in to productive economic circuit. This objective was expected to be attained by creating jobs, increasing income, diversifying income sources, availing better access to health and education, empowerment, and protecting against risks, among others. Practice however revealed that the outcome of microfinance have been both the anticipated positive changes and in some cases unexpected negative results. In conclusion governments and donors should know whether the poor gain more from small loans compared to other alternatives such as health care, education, agriculture, food aid, etc. most measures of the impact of microfinance institution fail to control for what would have happened in their absence. The net contribution or impact of microfinance to poverty reduction should be properly and more accurately measured.

2.3. Conceptual Framework

The independent variables in the conceptual framework were selected after extensive literature review. The framework assumes that participation is a net result of the positive or negative effects exerted by all the explanatory variables on the dependent variable.



CHAPTER THREE

RESEARCH METHODS

3.1. Description of the Study Area

Bale is one of the zones in the Oromia Region of Ethiopia which found on the south east of the country. Bale is named for the former Sultanate of Bale, which was in approximately the same area. Bale zone is characterized by a wide variety of geomorphic landscapes and agro-ecological zones. Sinana district is one of 11 districts found in Bale zone. It is bordered on south by Goba, on east by Goro and Ginnir, on west by Dinsho and on north by Agarfa and Gasara. Its land area is approximately 163,854ha. It is known for its high production potential for crops such as wheat, barley, faba beans, emmer wheat, field pea and livestock such as cattle, sheep, goats, horses and donkeys (Sinana Agriculture Office, 2021).

Sinana is characterized by bimodal rain-fall characteristics. The two seasons are locally called Bona and Ganna. Bona season extends from July to late December and Ganna season from mid-March to August. This bimodal rainfall helps farmers (crop producers) to produce twice a year and livestock producers to get feed twice a year. The agro-ecology of the district is suitable both for livestock and crop production. Highland agro-ecology in the district favors production of sheep rather than goats. The capital city of Bale zone is also located in this district allowing farmers to get better opportunity to sell their product than in other districts. The livestock population in the district is 340,702 of which sheep is 25,850.

The 2007 national census reported a total population for this Woreda of 118,594, of whom 61,968 were men and 56,626 were women; none of its populations were urban dwellers. The majority of the inhabitants said they were Muslim, with 59.99% of the population reporting they observed this belief, while 38.93% of the populations are followers of Ethiopian Orthodox Christianity. The district capital Robe also serves as the zonal capital for the Bale zone and is therefore a major supplier of inputs and services and trading and processing. Part of the district has a well-developed road network. Most of Sinana district is classified in Agro-Ecological Zone (AEZ) “moist dega”. The area receives total rainfall ranging from 900–1150mm (SARC, 2013) annually and most of the area is between 2000 and 2500 masl. Average temperature varies with

25 altitudes, but most of the area averages between 15–18°C. The majorities of the soils are Vertisols and most is cultivated.

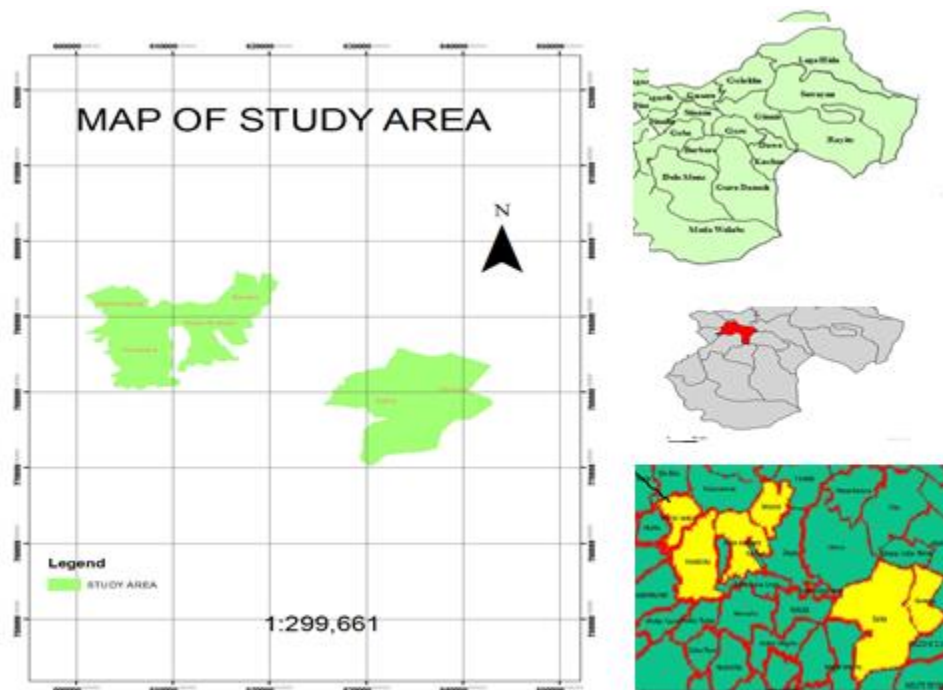


Figure 3.1: Map of the study area

3.2. Overview of RUSACCO in the Context of the Study Area

Bale zone is one of the 21 zones in Oromia zones which found on the south-east of the country. The zone has about 11 Woredas and two city administrations. Sinana is among 11 Woredas in Bale zone with 20 Kebeles and two rural towns. It has about 172,777 population size, of which 90,185 were males and 82,592 were females. As of the Sinana Woreda case, Walko and Peace are the MFIs which take major roles. There are about 22 women cooperative groups in the Woreda with about 1788 total active participants. However, the number of participants and initial capitals are different from kebele to kebele.

The women (target population) proposed for this study were rural residents. Most of the participants and non-participants of the cooperative saving and credit in the selected study area were households/females relying on farming activities. Though majority was farmers, there were active women who participate in mixed activities like farming and merchant. To be the participant of the cooperative saving and credit group, the only requirement is their interest. The

cooperative office of the Woreda is working on the issue by preparing timely guidelines, rules and regulations, making awareness on the benefit of RUSACCO, giving trainings relating how to be effective being the participant of the cooperative group, conducting back-payment follow-up, follow-up of business plan, etc.

3.3. Types, Sources and Methods of Data Collection

This study was conducted based on cross-sectional data obtained from primary data which will be collected through face-to-face personal interviews using structured questionnaires and interview methods. Cooperative official and other officers (or auditors) at higher position in Sinana Woreda were interviewed. At the highest level, a zonal cooperative agency and RUSACCO experts were used as to collect appropriate data. Focus group discussion and key informants' interview were also applied to collect sufficient information and to capture relevant data of beneficiaries. The focus group discussion was conducted with clients of microfinance institutions. A total of five focus group discussions involving 7 to 10 participants in each group were used. Key informants were also held with the staff participants of microfinance institutions so as to get information about how the institution is operating in the area and about the opinion of the people towards the program intervention. On the other hand, secondary data were collected from secondary relevant sources such as review of books, journal articles, unpublished study documents and other official reports of relevant quality, and internet sources.

3.4. Sampling Technique and Sample Size

To get the representative sample, the researcher used stratified random sampling technique. Sinana district was selected purposively because none of the studies done on the impact of microfinance service on rural women's income in the study area. For this study, both simple random and stratified probability sampling techniques were employed to select sample of respondent women. The sample size of the women for this study was determined by applying Kothari (2004) sample size determination formula:

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

Where: n=sample size; N=total population (19,570); Z=95% confidence interval under normal curve (1.96); e=acceptable error term (0.05) and p and q are estimates of the proportion of

population to be sampled ($p=0.5$ and $p + q=1$). Five percent (5%) of error term ($e=0.05$) was used to take representative and cost effective data for this study. Accordingly, the sample size for the study was determined as below:

$$n = \frac{(1.96)^2 * 0.5 * 0.5 * 19,570}{(0.05)^2(19,570 - 1) + (1.96)^2 * 0.5 * 0.5} \approx 378$$

Based on this formula, the total sample size was 378 sample women. Finally, from a total of 378 sample women, 189 participants and 189 non-participants were selected to get good matching in the propensity score matching estimation. Due to time, effort and cost constraints, out of 22 women cooperative groups in Sinana Woreda, only six kebeles were selected based on their number of participants in the group (two from each of small, medium and high participants' group), and then, women in the sample kebeles were stratified proportionally into participants and non-participants as follows:

$$n_h = \frac{N_h}{N} * n,$$

where $h = 1, 2, 3, \dots, 6$

Table 3.1: Number of women to be sampled from selected Kebeles

Kebele	Participants		Non-participants		Total sample
	Total	Sample	Total	Sample	
Gamora	11	5	2686	26	31
H/Boqa	25	12	4378	43	55
Salka	68	32	3021	30	62
Basaso	72	33	3046	30	63
Robe area	101	47	3821	38	85
W/Barisa	129	60	2212	22	82
Total	406	189	19,164	189	378

Then, the samples from the selected Kebeles were selected using simple random sampling technique.

3.5. Variable Definition and Hypothesis

3.5.1. Dependent Variable

Participation in RUSACCO: It is a dichotomous dependent variable in the model and it takes “1” if the woman is RUSACCO participant and “0”, otherwise.

Outcome Variables

The outcome variable taken for this study was the total annual income generated from crop production, livestock production, off-farm and non-farm activities in 2021.

Total annual income: It is a continuous and an outcome variable measured in ETB. From Table 3.2, it consists of annual agricultural cash income from sales of (grains, seed, fruit, livestock and their products), off-farm income and non-farm income. Off-farm income refers to the income generated from agricultural activities which take place outside the households own farm. This activity includes local daily wage labour at village level or the neighboring work at another person’s farm, firewood and charcoal selling and other off-farm activities.

Non-farm income refers to income from activities outside the agricultural sector. It includes handicraft activities (weaving, spinning, carpentry, house mudding, poet making), petty trade (grain trade, fruits and vegetables trade), selling of local drinks, trading of small ruminants and cattle, and remittance transfers within and across nations (Feleke, 2011).

Women’s income was positively related to participation in microfinance services indicating that the probability of improvement in income increases with the increase in microfinance participation (Yenesew, 2014). Thus, this variable is expected to have positive relationship with participation in microfinance services.

3.5.2. Independent Variables

The independent variables are variables that tend to explain a given dependent variable. The independent variables are identified from previous similar empirical studies and the nature of the study area. These variables are expected to determine impact of RUSACCOs on women income and are defined as follows:

Definition of independent variables

Age of woman: It is a continuous variable and defined as the number of completed years from the time of birth till the time when the survey was conducted (Kifle & Hailemichael, 2013). As age increases women would acquire knowledge and experience through continuous learning and the level of responsibility to manage the family and the need to accumulate assets for tomorrow becomes high. This variable is hypothesized that it has positive effect on the probability of positively benefited from RUSACCOs.

Family size: It is a continuous explanatory variable represented by positive integer values. It indicates the total number of persons in the family (Techan, 2018). As the household size increases, the number of mouths to be fed obviously increases, which share available income to consume. As the women's family size increases, the ability to save will be decreased. Bendig et al. (2009) found that family size to be related negatively affect the probability of membership in RUSACCO. Hence, it is hypothesized that the family size is indirectly or inversely related to membership in RUSACCO to incur the benefits from it.

Marital status: It is a dummy variable and takes the value of 1 if the respondent is married, 0 otherwise. It is assumed that married women can handle and manage their overall activities than women who divorced or single, that enabled them to participate in RUSACCO and produce more income and save more. As study Marziehet al. (2013) stated that married households are more economically developed than single households. Therefore, it is assumed that married women are expected to have a positive effect on the probability of membership in RUSACCO in order to get positive effects of it.

Educational status: This represents the level of formal schooling completed by the women. It is a continuous variable. Educated women are expected to have more exposure to the external environment and accumulated knowledge through formal learning which might enable them to pursue livelihood strategy that leads to better income through making use of available opportunities, which lead to increased women consumption level. Teka (2008) found that education level of the households was positively related to the probability of membership in RUSACCO. Therefore, education level of the women has a positive effect on RUSACCO membership.

Annual income: It is a continuous variable. Total annual income earned from sale of agricultural products, non-farm and off-farm activities by improving its productivity to secure the households' basic needs and gradually to change the household's life style. Abdelkhaleket al.(2009) stated that annual income positively affects the saving level of the household. Hence, the variable is hypothesized that it has a positive effect on the positive impact of participation in RUSACCOs.

Distance fromRUSACCOscenter: It is a continuous variable and distance is measured in terms of kilometers. The close proximity of RUSACCO to the beneficiaries would save farm resources (time, labor) which otherwise would have been spent to access different financial products and services and it might also motivate households to join the cooperative. RUSACCOs which are located at far distant areas, on the other hand, might discourage members' participation in the cooperative and it becomes difficult to follow up and control the operational system of the cooperatives(Teka,2008). Therefore, it is hypothesized that distance to RUSACCOs'center is negatively influence the positive impact ofRUSACCOson women income.

Annual expenditure: It is a continuous variable. It refers to the sum of womenexpenses on the food item, production items, clothing, education, health, etc. (Teka, 2008). The more the respondents squander, their saving reduces. Therefore, it is hypothesized that this variable has a negative relationship with the positive impact of RUSACCOs.

Amount of loan borrowed: It is a continuous variable measured in Ethiopian birr. The higher saving amount would naturally have led to higher loan amount and attracts households to join RUSACCOs (Abiy, 2017). Therefore, the amount of loan is hypothesized that it has a positive association on the probability of participating in RUSACCO and benefited from it.

Participation in training:It is a dummy variable, which takes a value of "1" if yes and "0", otherwise. Training would increase the awareness level of household and exposure to new ideas, information, activities, opportunities, working environment, and different sources of income, prudent handling of cash, etc. (Teka, 2008). Usually, the training program focuses on organization, management, objectives, operation system, savings mobilization, etc. of RUSACCOs. Therefore, participation in training would have positive impact on the decision of women to join cooperative and to be benefited from it.

Credit use: It is a dummy variable that takes a value of “1” if the women are a credit user for the last 12 consecutive months and “0”, otherwise. RUSACCOs are also entrusted to provide access to credit for rural women who may not have access to formal banks and microfinances (Abay et al., 2015). It is assumed that those women who were the beneficiaries of credits over the last 12 months might have developed experiences on how to use loan purposefully and how to make money easily from the available resources. Therefore, it follows that they desperately need financial products in their day to day activities. Since one of the major objectives of RUSACCOs is to offer loan products to the members, those who have credit use experiences are expected to be pioneer in the RUSACCO movement and positively hypostasized.

Participation to social association/groups: It is a dummy variable that takes a value of “1” if the women are membership of idir, equb, cooperative and other self-aid institutions, social association and “0” otherwise. Membership in social association implies that households meet regularly and allow discussions on farm issues and households within a group learn from each other how to be positively benefited from RUSACCOs. The evidence suggests that network effects are important for individual decisions, and that, in the particular context of agricultural innovations, households share information and learn from each other. Therefore, in this study it is expected that membership to any social association have positively benefited from RUSACCOs.

Livestock size: It is a continuous variable and measured in terms of tropical livestock unit. Livestock holding is the number of livestock (camel, oxen, cow, sheep, goat, donkey etc.) owned by women (Kifle & Hailemichael, 2013). Livestock ownership is hypothesized to be positively related to the adoption of technologies because it serves as proxy for wealth status. Livestock's are the households' important sources of income, means of transportation, source of food and draught power for crop cultivation and it is a proxy for the wealth status of the women in the study area. In this study, it is expected that livestock size affects positively membership of RUSACCOs in promoting women saving and credit.

Farm size: It is a continuous variable and measured in hectares. Farm size is the total farm size owned by the respondents (Kifle & Hailemichael, 2013). It is hypothesized that there is a direct relationship between size of land, income and saving.

Dependency ratio: It is a ratio of number of dependent family to active labour force of the family. It is a very useful tool to study the economic advantages of the age structure.

$$\text{Mathematically: } ADR = \frac{\text{children} + \text{elderly}}{\text{working ages}} \times 100 = \frac{P_{0-14} + P_{65+}}{P_{15-64}} \times 100.$$

Table 3.2: Summary of hypothesis of response and explanatory variables

Variables	Measurement scale	Codes	Expected sign
Participation in Mf service	Dummy	“1” for participants and “0” otherwise	+
Age	Continuous	Year	+
Education level	Categorical	Level of education or year of schooling	+
Cultivated farm-size	Continuous	Hectare	+
Family size	Discrete	Number of family	+
Livestock owned	Continuous	Tropical livestock unit (TLU)	+/-
Occupation	Categorical	1=farmer, 2=employed, 3=merchant, 4=other	-
Dependent ratio	Continuous	Ratio of number of dependent family to active labour force of the family	-
Frequency of extension contact	Continuous	Number of visit per year	+
Distance from MFIs	Continuous	Hour	-
Access to social media	Dummy	“1” for those have access to social network(radio, mobile phone) and “0” otherwise	+
Training regarding saving and credit	Dummy	“1” for those have training and “0” otherwise	+
Annual income (TAINCM)	Continuous	Birr	

3.6. Data Collection

The researcher gave training the enumerators on a number of relevant aspects of the research prior to the interviews. This is meant to help the team on understanding the objectives of the research. A household survey was conducted using a semi-structured questionnaire that pre-tested. The results of the pre-test assisted in the restructuring of the final questionnaire by paraphrasing or rephrasing questions that are unclear to both the respondents and interviewers, incorporating missing variables and omitting irrelevant questions.

Data was collected on socio-economic and demographic characteristics using the pre-tested semi-structured questionnaire. All sample participants and non-participants of RUSACCOs program was visited and interviewed. In addition, to get the detailed information regarding the problem under study interviews was held with one SinanaWoreda Cooperative office head and two members of the office. Primary data was also collected through key informant interviews using a checklist of issues. Focus group discussions were employed to capture information based on consensus and to verify the responses from the individual interview. Respondents were placed in groups of 8 – 10 and a checklist of issues was used to facilitate the discussion and notes have been taken. The study was also used observation method which enables the researcher and the enumerators to validate the women's responses.

Data collected was include sources of women income, membership of RUSACCOs groups, access to infrastructure, land holding size and distance between a household's residence and RUSACCOs local office.

Secondary data and other relevant information were collected from regional bulletins, reports, journals, and publications from Ministry of Agriculture, MoTI and records from SinanaWoredaRUSACCOs Cooperative Union Limited and others. The researcher were also used observation to find out physically how the microfinance activities have helped shape the livelihood of women with regards to the food they eat, growth in the petty trading and their role in the household decisions.

3.7. Methods of Data Analysis

In this study, both descriptive and econometric analyses were used. The descriptive statistics was used to evaluate the significances of changes in some key parameters between the year of first intervention and the study period. Accordingly, frequency distribution, mean, standard deviation, chi-square test and independent t-test values of some important variables were computed to compare the mean differences between participants and non-participants of RUSACCOs.

3.7.1. Logit Model

Contribution of RUSACCOs services to poverty alleviation is determined by institutional factors such as loan purposes, loan term, loan size, land size, intensity of off-farm economic activities,

marketing services, etc. Variation in the contribution of RUSACCOs services to incremental incomes of the target groups may be due to any or all of these factors, which also vary spatially and temporally. In order to analyze the influences of these factors and identify the relative importance of these variables, a binary model will be used. A logit model is used to estimate the propensity scores using all explanatory variables. In this study the dependent variable is the participation of woman in RUSACCOs (“1” = participant, “0” = non-participant). Accordingly, a logit distribution model was defined following Liao (1994), Gujarati (1988) and Aldrich and Nelson (1984):

$$\text{logit}(p_i) = \log\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_p x_{pi},$$

where, $p_i = (y=1)$ = probability of success and could be estimated:

$$P_i = \frac{1}{1 + e^{-Z_i}} = \frac{e^{Z_i}}{1 + e^{Z_i}}$$

Where p_i : is a probability that the i^{th} woman is in participant group (category).

e^{Z_i} : stands for the irrational number e to the power of Z_i

Z_i : is a function of N-explanatory variables which is also expressed as:

$$Z_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_p x_{pi}$$

Where $x_1, x_2, \dots, x_n$ = Explanatory variables

β_0 - is the intercept, $\beta_1, \beta_2, \dots, \beta_n$ are the logit parameters (slopes) of the equation in the model.

3.7.2. Propensity Score Matching Model

This study employed Propensity Score Matching model to analyze the impact of microfinance on the income of women. Propensity Score Matching (PSM) is a non-parametric method that is widely used in the impact evaluation of different interventions (Heckman, 1998; Ravallion, 2005). In order to estimate the average treatment effect on treated (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 effect of microfinance credit participation on the income of women is explained as:

$$\tau_i = Y_i(D_i = 1) - Y_i(D_i = 0)$$

Where τ_i is effect because of participation in RUSACCO, Y_i is the outcome (the impact of participation in RUSACCO on women income) and D_i is whether women i was participate in RUSACCO or not. However, $Y_i(D_i = 1)$ and $Y_i(D_i = 0)$ cannot be occurred simultaneously for the same individual at the same time. Based on this, the position woman in the treatment either $Y_i(D_i = 1)$ or $Y_i(D_i = 0)$ is unobserved outcome. Hence, analyzing individual treatment effect τ_i is difficult. Therefore, estimating the average treatment effects of the population than the individual person was very important. Among the average treatment effect, average treatment effect on treated (ATT) is one of the most commonly used in impact assessment and it is described as:

$$\tau_{ATT} = E(\tau/D = 1) = E[Y(1)/D = 1] - E[Y(0)/D = 1]$$

Here, the outcome variable of participant women, $E[Y(1)/D = 1]$ is observed. However, the outcome variable of participant women had they not participated, $E[Y(0)/D = 1]$ is not observed. Hence, substituting the outcome (total annual income of participant women had they not participated) $E[Y(0)/D = 1]$, for outcome (total annual income of non-participant women) is impossible in non-experimental impact assessment. If substitute, it implies that variables that determine women's participation decision in microfinance credit also determine the total annual income of women. This means that, the total annual income of women from participant and non-participant would differ even in absence participation, this leading to a self-selection bias. By deducting $E(Y0/D=0)$ from the left and the right side of the equation we can specify the average treatment effect on treated as follow:

$$\begin{aligned} E[Y(1)/D = 1] &= E[Y(0)/D = 1] - E[Y(0)/D = 0] = \tau_{ATT} + E[Y(0)/D \\ &= 1] - E[Y(0)/D = 0]. \end{aligned}$$

In this case, the terms in the left side are observables and the average treatment effect on treated can determined if and only if $E[Y(0)/D = 1] - E[Y(0)/D = 0]$ zero. This occurs when there is self-selection bias. In order to resolve the selection matter in non-experimental impact studies the following two assumptions are required.

Conditional independence assumption: It indicates the outcomes are independent of treatment and conditional on (X_i) . This assumption shows that the selection is only depend on observable characteristics that affect both participation decision of women and the outcome variables simultaneously (Caliendo&Kopeinig, 2008).

Common support: Is refers to the area in which both participant and non-participant women have propensity score values in common. In other words, it is the area which contains the minimum and maximum propensity score of participant and non-participant groups, respectively. Those observations whose propensity scores is smaller than the minimum and larger than the maximum propensity score value are discarded from the treatment and control groups (Caliendo&Kopeinig, 2008).

That is $0 < P(D = 1)/X < 1$.

Given these two assumptions, the propensity score matching algorithm to estimate ATT can be described as:

$$\tau_{ATT}^{PSM} = E_{P(X)/D=1}\{E[Y(1)/D = 1, P(X)] - E[Y(0)/D = 0, P(X)]\}$$

Where, $P(X)$ is the propensity score calculated from covariate X . Equation is explained as; the PSM estimators is the difference between mean of outcomes over common support region.

3.7.2. Matching Estimate of Propensity Score

A logit model was estimated using all explanatory variables to estimate the propensity scores. Next, the best matching estimator that fit the data was chosen. Then, depend on the propensity scores estimated and matching estimator selected, matching between treatment and control groups was carried out to measure the effect of ruralsaving and credit on the average total annual income of women.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

The major objective of the study was to assess the impact of participation in RUSACCO on women income in Sinana Woreda of Bale zone. Hence, this chapter presents the findings of descriptive statistics and econometric analysis of the survey data of the study.

4.1. Descriptive Statistics for Categorical (Dummy) Variables

Marital status: The data collected indicated that from the total sample women, 311 women (82.28%) were married and the remaining 67 women (17.72%) had others marital status (single, divorced and widowed). In addition, the result of chi-square shows that there is significant difference between participants and non-participants with respect to their marital status at 5% significance level ($p\text{-value} = 0.01$).

Participation in training: From the total sample women, 246 women (59.79%) were received training and the remaining 177 women (46.82%) were not received training. The result of chi-square shows that there was significant difference between participants and non-participants with respect to participation in training at 1% significance level ($p\text{-value} < 0.001$).

Occupation: Table 4.1 implied that from the total sampled women 62.44%, 10.85%, 19.31% and 7.4% of the respondents were farmers, employed, merchant and other, respectively. The result of chi-square shows that there was significant difference between participants and non-participants with respect to occupation at 1% significance level ($p\text{-value} < 0.001$).

Credit use: The survey results revealed that from the total sample women, 201 women (53.18%) were received credit and the remaining 177 women (46.82%) were not received credit. The result of chi-square shows that there is significant difference between participants and non-participants with respect to credit use at 1% significance level ($p\text{-value} < 0.001$). This shows that those women who were the beneficiaries of credits over the last 12 months might have developed experiences on how to use loan purposefully and how to make money easily from the available resources.

Access to media:The data collected indicated that from the total sample women, 321women (84.92%) had access to media and the remaining 57women (15.08%) had no access to media. In addition, the result of chi-square shows that there is significant difference between participants and non-participants with respect to access to media at 5% significance level (p-value < 0.001).

Table 4.1: Descriptive Statistics for Categorical Variables

Variables	Value	Non-participant	Participant	Total	Chi-square	p-value
Marital status	Otherwise	40(59.70)	27(40.30)	67(17.72)	4.81	0.01
	Married	149(47.91)	162(52.09)	311(82.28)		
Training	No	126(82.89)	26(17.11)	152(40.21)	58.72	<0.001
	Yes	63(25.61)	163(74.39)	246(59.79)		
Occupation	Farmer	130(55.08)	106(44.92)	236(62.44)	92.28	<0.001
	employed	18(43.90)	23(56.10)	41(10.85)		
	Merchant	31(42.47)	42(57.53)	73(19.31)		
	other	10(35.71)	18(64.28)	28(7.40)		
Credit use	Non-user	149(84.18)	28(15.82)	177(46.82)	96.43	<0.001
	User	40(19.90)	161(80.10)	201(53.18)		
Access to media	No	32(56.14)	25(43.86)	57(15.08)	41.15	<0.001
	Yes	157(48.91)	164(51.09)	321(84.92)		

Source: Computed from survey data.

4.2. Descriptive Statistics for Continuous Variables

Age:The survey results implied that higher age was recorded for RUSACCO participants with about 42.25years on average and 39.60 yearsfor non-participants. The mean age difference was insignificant at 5% level of significance.

Family size:The survey results implied that higher family size was recorded for RUSACCO participants with about 5.65 family sizes on average per woman and 3.34 per woman for non-participants. The mean family size difference was significant at 5% level of significance.This may shows that as the number of family size increase, the ability to save was decreased which then leads to negatively affect the probability of membership in RUSACCOs.

Education status: The data analysis results revealed that average education status is 6.24 for participants, 4.42 for non-participants and 5.4 for the whole sample. Furthermore, the mean education status difference between participants and non-participants is found to be statistically significant at 1% level of significance. This shows that women education status helps them not only to understand how to make money but also to prudently and profitably handle cash in financial institutions, which are found in nearby areas. Educated women are expected to have more exposure to the external environment and accumulated knowledge through formal learning which might enable them to pursue livelihood strategy that leads to better income through making use of available opportunities and to be participants of RUSACCO.

Total livestock unit (TLU): The survey results implied that higher TLU was recorded for RUSACCO participants with about 10.19 livestock on average and 9.60 livestock for non-participants even if the mean livestock unit difference was insignificant at 5% level of significance.

Total income: The data analysis implied that higher income was recorded for RUSACCO participants with about 94885.90 ETB on average per woman and 71232.33 ETB per woman for non-participants. The mean income difference was significant at 5% level of significance. This shows that as the income increase, the ability to save was increased which then leads to positively affect the probability of membership in RUSACCOs.

Farm size: The survey results implied that higher family size was recorded for RUSACCO participants with about 2.74 hectare farm sizes on average per woman and 1.18 hectare per woman for non-participants. The mean farm size difference was significant at 5% level of significance. This shows that as the farm size increase, the ability to save was increased which then leads to positively affect the probability of membership in RUSACCOs.

Annual saving: The data analysis implied that the saving of RUSACCO participants was higher with about 9802.26 ETB on average per woman and 830.25 ETB per woman for non-participants. The mean income difference was significant at 5% level of significance. This shows that the saving habit of RUSACCO participants was higher than that of non-participants which then leads to positively affect the probability of membership in RUSACCOs.

Distance from RUSACCOs center:Distance from RUSACCOscenter is recorded for RUSACCO-participants with about 1.56km on average per women and 2.08km per women for non-participants. The mean distance for both groups from RUSACCO was significant at 1% significance level. This may shows thatas the distance from RUSACCO office increase the women membership will decrease because distance to RUSACCOcentermay discouraging participants' participation in the cooperative and it becomes difficult to follow up and control the operational system of the cooperatives.

Annual expenditure:The survey results implied that higher annual expenditure was recorded for RUSACCO participants with about 92721.10 birrexpenditure on average and 70925.90 birr expenditure for non-participants. The independent t-test result also implied that mean expenditure difference was significant at 5% level of significance.

Amount of loan borrowed:The data analysis shows that, on average, amount of loan the women borrowed are10562.22 ETB for participants, 3598.67 for non-participants and 6286.84 ETB for the whole sample. The mean difference of amount of loan borrowed between participants and non-participants is found to be statistically significant at 1% significance level.

Table 4.2: Descriptive Statistics for Continuous Variables

Variables	Non-participant		Participant		Total		t-value
	Mean	Sd	Mean	Sd	Mean	Sd	
Age	42.25	8.12	39.60	9.63	40.05	8.42	0.5218
Family size	3.34	2.60	5.65	2.09	4.53	2.41	3.48**
Education	4.42	3.22	6.24	3.97	5.40	3.73	-4.26***
Livestock	9.60	2.58	10.19	1.65	7.78	2.24	-1.079
Total income	71232.33	2049.07	94885.90	2003.24	81935.19	1810.44	-5.87***
Farmsize	1.18	0.54	2.74	1.03	1.44	0.84	-4.03***
Annual saving	830.25	44.42	9802.26	2714.14	5327.39	2849.54	-8.27***
Distance	2.08	0.82	1.56	0.69	1.65	0.80	4.48***
Expenditure	70925.90	3032.94	92721.10	6563.35	81735.59	24660.23	-2.62**
Amount loan	1513.58	106.02	9075.19	176.65	5266.10	471.59	-7.30***

Note: *** and ** represent significant at 1% and 5%level, respectively.

Source: Computed from survey data.

4.3. Factors Affecting Participation of Women in RUSACCO

4.3.1. Challenges of Saving and Credit Cooperatives

The researcher would like to investigate major challenges of rural saving and credit cooperatives encountered in increasing women's income in the study areas in the survey periods. Major challenges of saving and credit cooperatives which are identified by the researcher were distance from RUSACCO center, high interest rate, irregular general body meetings, lack of awareness on saving habit, lack of information, lack of knowledge, lack of proper saving, lack of road access, limited training opportunities, limited loan amount, scattered settlement, lack of RUSACCO auditing in time, weak educational status and weak management of RUSACCO activities properly.

Accordingly, from the total sampled women 56.35%, 53.44%, 63.23%, 84.13%, 80.16%, 72.75%, 71.43%, 44.71%, 78.84%, 64.29%, 79.10% and 69.31% of the respondents have agreed that the distance to the RUSACCO office, high interest rate, irregular general body meetings, lack of awareness on saving habit, lack of information, lack of knowledge, lack of proper saving, lack of road access, limited training opportunities, limited loan amount, scattered settlement, lack of auditing in time, weak educational status and weak management of RUSACCOs were major challenges, respectively.

Table 4.3: Challenges of Saving and Credit Cooperatives

Challenges	Agree		Disagree	
	Freq.	%	Freq.	%
Distance from RUSACCO center	213	56.35	165	43.65
Acceptances of interest rate	202	53.44	176	46.56
Irregular general body meetings	239	63.23	139	36.77
Lack of awareness on saving habit	318	84.13	60	15.87
Lack of information	303	80.16	75	19.84
Lack of knowledge	275	72.75	103	27.25
Lack of proper saving	270	71.43	108	28.57
Lack of road access	169	44.71	209	55.29
Limited training opportunities	298	78.84	80	21.16
Scattered settlement	243	64.29	135	35.71
The RUSACCO are not audited in time	299	79.10	79	20.90
Weak educational status	262	69.31	116	30.69

Source: Computed from survey data.

4.3.2. Institutional Problems Hidden with Credit Providing Agency

The other major problems of saving and credit cooperatives which are identified by the researcher were lack of follow-up, timely auditing, guidelines/rules, membership duration, credit use, amount of loan, and training schedule.

Table 4.4 implied that from the total sampled women 67.72%, 64.55%, 63.49%, 52.38%, 59.26%, 57.14%, 66.14% and 73.54% of the respondents have agreed that lack of follow-up, untimely auditing, unclear and compatible guidelines/rules, insufficient membership duration, low credit usage opportunity, limited amount of loan, inappropriate training schedule and weak management capacity were major problems, respectively.

Table 4.4: Institutional Problems Existing in RUSACCO

Challenges	Agree		Disagree	
	Freq.	%	Freq.	%
No sufficient follow-up	128	67.72	82	32.28
Lack of timely auditing	122	64.55	67	35.45
Lack of clear and compatible guidelines/rules	120	63.49	69	36.51
Inappropriate membership duration	99	52.38	30	47.62
Limited credit usage opportunity	112	59.26	37	40.74
Insufficient amount of loan	108	57.14	51	42.86
Inappropriate training schedule	125	66.14	64	33.86
Weak management capacity	139	73.54	50	26.46

Source: Computed from survey data.

4.4. The Impact of Participation in RUSACCO on Women Income

4.4.1. Propensity Scores Estimation

In order to assess the impact of rural saving and credit cooperative (RUSACCOs) on women income, the PSM method was used. The estimation process was done using `psmatch2` in STATA 14. In PSM estimation, the following steps were performed.

The first step in PSM estimation is choosing binary outcome models in estimating the probability of membership in RUSACCO of women. The dependent variable in the impact assessment analysis takes the value of 1 if woman was participants of RUSACCO and 0, otherwise.

A binary discrete choice regression model (logit or probit) can be used for estimation of the propensity score. Both logit and probit regression models were compared. Given the two models, the one with the smaller AIC and BIC fits the data better. Accordingly, logit model was preferred over probit model in estimating the propensity score. Thus, Table 4.5 illustrates the binary logit regression estimates for membership of RUSACCO of women. There were multiple factors which affects the membership of women in rural saving and credit cooperatives. Based on the collected data and using the appropriate econometrics model (logit), the following analysis was drawn and has been discussed on the significant explanatory variables below.

Marital status: it is positively related with women to be membership of RUSACCO and statistically significant at 1%. The result shows that if woman was married the probability of being membership of RUSACCO increases by 26.8%. The result was consistent with the result of Zemen which is conducted in 2014. In addition, Amir (2020) stated that married women can handle and manage their overall activities than women who divorced or single, which enabled them to produce more income and save more also, attracts the women to join rural saving and credit cooperatives.

Education status: it is positively correlated with women to be membership of RUSACCO and statistically significant at 1% significance level. The marginal effects result shows that if educational level of woman increases by 1 grade, the probability of being membership of RUSACCOs increase by 6.8%. In other words, the marginal effect of value 0.068 implies that a unit increment in educational level would increase the women participation by 6.8 percentages. This study was also consistent with Zemen which is conducted in 2014. Educated woman tend to understand the new intervention more quickly than illiterate woman. The assumption of the study was that, if the level of respondent woman educational level increases, the probability of joining a RUSACCO will also increase (Amir, 2020).

Family size: Family size of women was statistically significant at 1% and negatively affects woman to be membership of RUSACCOs. The result shows that if family size of

women increase by one unit the probability of being participant of RUSACCO decreases by 5.2% (or the marginales effect of value 0.052 implies that a unit decrement in family size would increase the women participation by 5.2 percentages). The family size increase means that the women had to meet the family expenses of their children for schooling, food, health expenses, in addition to farm input expenses, thereby leading women not to have more money. Therefore, women with high family size were decrease the probability of joining RUSACCOs, in the study area. High family size had negative impact on income due to the spent of much money on consumption (Amir, 2020).

Distance from RUSACCOs center: is correlated negatively with woman to be membership of RUSACCO and statistically significant at 5% significance level. The result shows that if the woman living area's distance from RUSACCO increase by 1km, the probability of being membership of RUSACCO decreases by 14.2%. In other words, the marginales effect of value 0.142 implies that a unit decrement to distance would increase the women participation by 14.2 percentages. The scholars also stated that the close proximity of RUSACCO to the beneficiaries would save resources (time, labor) which otherwise would have been spent to access different financial products and services and it also motivate women to join the RUSACCOs. RUSACCOs which were located at far distant areas, on the other hand, discourage women's joining in the cooperative and it was difficult to follow up and control the operational system of the cooperatives.

Participation in training: is related with women to be membership of RUSACCO positively and statistically significant at 5% probability level. The analysis result shows that if the woman participates in training, the probability of being membership of RUSACCO increases by 22%. This implies that women who have participated in RUSACCOs training programs have a higher probability of joining RUSACCO than women who have not got training. The possible reason might that in the rural area there is a great gap between the demand for financial product by the farm women and the supply of products by financial product providers. Often, under such circumstances possible options and experiences needed to deal with this issue are not available in the rural settings. Therefore, knowledge gained through training might give a chance to the beneficiaries to be part of the solution. The other possible reason is that RUSACCOs are financial institutions that are owned by the participants providing financial services, products and

net benefits obtained from the operation to the participants themselves. Hence, an in-depth understanding about the operation system of the cooperatives through training might encourage them to be membership of the RUSACCOs. This study is consistent with the result of Teka which is conducted in 2008.

Credit Use: The credit use was statistically significant at 1% and positively related with the membership of RUSACCO. The result shows that the probability of woman being membership of RUSACCO increases by 48.4% if a woman is credit user. In the study area, those participant women who were the beneficiaries of credits over the past 12 months would develop experiences on how to use credit purposefully and enhance the earning potential than non-participants women. Since one of the major objectives of RUSACCOs was to offer credit to the participants, those who had credit use experience were expected to be membership in RUSACCOs. This result was consistent with Abiy's finding that conducted in 2017.

Amount of loan borrowed: This variable is correlated with women to be membership of RUSACCO positively and statistically significant at 1% probability level. The marginal effect of value 0.073 implies that a unit access to loan would increase the women participation by 7.3 percentages. The reason for this relationship might be the fact that the higher savings amount would naturally have led to higher loan amount. Other reason would have been that higher loan could have enabled the farmers to earn more and attracts women to join the RUSACCOs. This result is consistent with the result of Abiy (2017).

Dependency ratio: This variable is correlated with woman to be membership of RUSACCO negatively and statistically significant at 1% probability level. The marginal effect of value 0.097 implies that a unit decrement in dependency ratio would increase the women participation by 9.7 percentages. Other reason would have been that lower dependency could have enabled the farmers to earn more and attracts women to join the RUSACCOs. This result is consistent with the result of Abiy (2017).

In connection with the above results, the study by Eyob et al. (2019) retorted that women participation in RUSACCO was significantly affected by access to loan, level of education and participation in training and interest rate. Furthermore, the study done by Berhan et al. (2011) revealed that there were positive effects of access to training, formal education, contribution to

the household income, duration of loan use and utilization of loan on participation of women in RUSACCO. Genet (2008) also added that poor management, low credit access, and smallness of the loan size were the significant determinants of women membership, and the number of drop outs is also increased.

Table 4.5: The logit regression estimate of membership of RUSACCO

Independent Variables	Coefficient	Std. error	P>z	dy/dx
Age	-0.018	0.02	0.534	-0.003
Family size	-0.311***	0.10	0.006	-0.052
Marital status	1.62***	0.08	0.028	0.268
Educational status	0.26**	0.09	0.013	0.068
Livestock	0.209	0.15	0.169	0.037
Farm size	0.08	0.46	0.863	0.019
Distance from RUSACCOs	-0.70**	0.34	0.048	-0.142
Participation in training	1.10**	0.07	0.023	0.220
Credit use	2.40***	0.56	0.001	0.380
Dependency ratio	-0.67***	0.08	0.001	0.097
Participation in social association	-0.29	0.51	0.351	-0.070
Total annual saving	1.60	0.81	0.461	0.356
Total annual expenditure	-0.04	0.94	0.324	-0.03
Amount of loan borrowed	0.41***	0.06	0.000	0.073
Constant	-12.32	8.26	0.074	
Wald $\chi^2(14) = 123.61$, Pseudo $R^2 = 0.817$, Log pseudo likelihood = -69.25				
Number of obs = 378				

Note: *** and ** represent level of significance at 1% and 5% respectively.

Source: Computed from survey data.

After propensity score estimation, the common support region should be imposed on the propensity scores distribution of the participants of RUSACCO women and non-participant women. As shown in Table 4.6, the estimated propensity scores vary between 0.0106 and 1 (mean = 0.782) for participants of RUSACCO (treatment) women, and between 0.0001 and 0.9576 (mean = 0.119) for non-participants of RUSACCO (control) women. The common support region would then lie between 0.0106 and 0.9926. In other words, women whose estimated propensity scores are less than 0.0106 and larger than 0.9926 are not considered for the matching exercise. As a result of this restriction, 67 participants and 72 non-participants of RUSACCO totally 139 women were detected from the analysis.

Table 4.6: Distribution of Estimated Propensity Scores

Groups	Observation	Mean	Std. Dev.	Min	Max
Total sample women	378	0.421	0.379	0.0001	1
Participants	189	0.782	0.230	0.0106	1
Non-participants	189	0.119	0.109	0.0001	0.9926

Source: Computed from survey data.

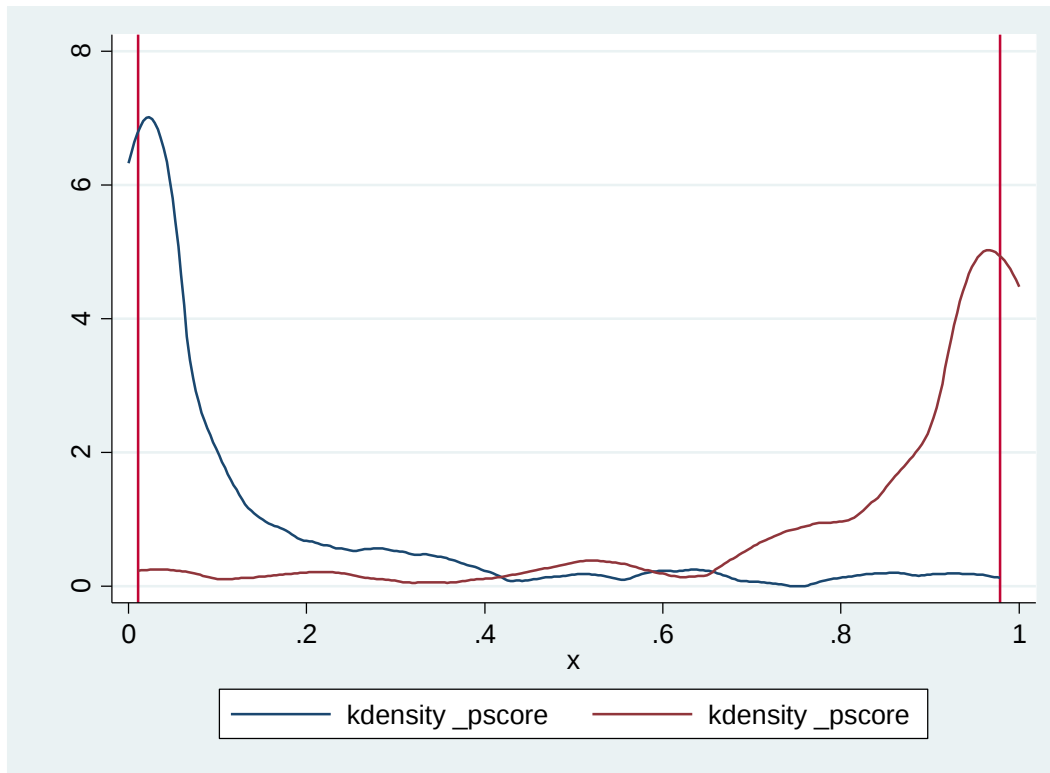


Figure 4.1: Graph of common support region

After the estimation of propensity scores and the common support region, the next step is looking for an appropriate matching estimator. The alternative matching estimators (algorithms) were searched in matching the participants and non-participants women in the common support region. Therefore, nearest neighbor matching with neighbor (2) was chosen since it resulted in a relatively low pseudo-R², best balancing test-all covariates were insignificant after matching, and it also contains large matched sample size as compared to other matching estimators as indicated in Table 4.7.

Table 4.7: Performance of Different Matching Algorithms

Matching Estimator		Matching performance criteria		
		Balancing test*	Pseudo-R ²	Matched sample size
Nearest neighbor	neighbor(1)	9	0.079	239
	neighbor(2)	12	0.032	239
	neighbor(3)	9	0.071	239
	neighbor(4)	11	0.059	239
	neighbor(5)	11	0.037	239
Kernel	bwidth(0.01)	7	0.055	239
	bwidth(0.1)	9	0.062	239
	bwidth(0.25)	9	0.056	239
	bwidth(0.5)	9	0.052	239
Caliper or Radius	radius caliper (0.01)	7	0.047	239
	radius caliper (0.1)	9	0.081	239
	radius caliper (0.25)	11	0.070	239
	radius caliper (0.5)	11	0.048	239

* Number of independent variables with no statistically significant mean difference between the matched groups of women.

Source: Computed from survey data.

After choosing the best performing matching algorithm, the next task is to check the balancing of propensity score and covariate using different procedures by applying the selected matching algorithm (in our case, Nearest neighbor N(2) matching). The main purpose of the propensity score estimation is not to obtain a precise prediction of selection into treatment, but rather to balance the distributions of relevant variables in both groups. The balancing powers of the estimations are ensured by different testing methods such as reduction in the mean standardized bias between the matched and unmatched women, equality of means using t-test and chi-square test for joint significance of the variables used.

In all cases, it is evident that sample differences in the unmatched data significantly exceed those in the samples of matched cases. Therefore, the process of matching those creates a high degree of covariate balance between the treatment and control samples that are ready to use in the estimation procedure.

Table 4.8: Balancing test of impact of participation in RUSACCO on woman's income

Variables	Matching Sample	Mean		% Bias		t-test	
		treated	control	standard	reduction	t	p> t
Age	Unmatched	43.26	43.25	-22.8		2.23	0.027
	Matched	44.15	43.25	-9.96	66.1	0.72	0.472
Family size	Unmatched	5.65	3.34	-30.1		-2.51	0.013
	Matched	5.41	5.12	13.2	57.2	1.10	0.304
Marital status	Unmatched	0.85	0.79	26.0		2.22	0.027
	Matched	0.82	0.68	47.9	-89.9	2.42	0.016
Education status	Unmatched	6.24	4.42	61.10		5.30	0
	Matched	2.82	1.10	23.0	60.9	1.51	0.132
Livestock	Unmatched	10.19	5.45	33.9		2.77	0.006
	Matched	40.10	42.23	-25.5	95.9	-2.21	0.028
Farmsize	Unmatched	2.74	1.18	49.8		6.03	0
	Matched	1.53	1.50	7	89.1	0.42	0.675
Dist. RUSACCO	Unmatched	1.56	2.08	-64.1		-6.12	0
	Matched	1.48	1.72	-32.9	48.21	-2.23	0.027
Part. Training	Unmatched	0.94	0.57	125		9.21	0
	Matched	0.93	0.94	-2.9	96.2	-0.42	0.675
Credituse	Unmatched	0.94	0.21	221.1		16.2	0
	Matched	0.89	0.92	7.3	97.2	0.60	0.549
Dependent ratio	Unmatched	0.64	0.88	-54.1		-3.76	0
	Matched	0.66	0.70	-9.6	80.7	-0.78	0.436
Participation in social ass.	Unmatched	0.58	0.29	70.2		6.16	0
	Matched	0.55	0.47	27	64.3	1.67	0.096
Total saving	Unmatched	9802	853	78.2		15.2	0
	Matched	6350	846	0.2	95.6	20.8	0
Total expenditure	Unmatched	92721	70920	7.2		1.02	0.309
	Matched	91048	91280	-27.6	-82.2	-5.57	0
Amount loan	Unmatched	9075.5	1513.1	86.2		10.3	0
	Matched	7356.3	7032.4	-23.1	66.2	-4.94	0

Source: Computed from survey data.

The final step in the PSM process is to estimate treatment effects on the outcome variable in the matched sample through a student's t-statistic. In Table 4.9, the estimation result presented a supportive evidence of statistically significant impacts of memberships in RUSACCO on woman income. The estimation result presented that, on average, membership of women in RUSACCO have increased annual income by 9263.94birr during the survey year. The estimated average treatment effect (ATT) showed that membership of women in RUSACCO has

significant impact on income of participantwomen with significant t-statistic (25.42) at 1% significance level. The average amount of annual income of participantwomen was higher by 61.14% when compared with the average amount of income of non-participantwomen in the study area during survey year.Scholars also supported this issue. For instance, the study conducted by Tadele et al. (2018) revealed that the mean yearly income of participants was greater than that of non-participants of RUSACCO. In line with this, Eyob et al. (2019) also stated that women through cooperative were able to acquire more assets than before and have an improved well-being. Most of them were able to increase their monthly income, consumption and educational expense and improve savings.

In addition, the study done by Getahun (2019) stated that the participation in RUSACCO plays a great role for the improvement of household economy and life quality.The participant women had increased their household saving and income after they joined RUSACCO. In addition, from past studies in Ethiopia it is observed that, RUSACCOs had substantial impact on improving women’s income, to have their own assets and brought change in decision making and asset formation compared to the “before” situation of the women member. RUSACCOs provided a comprehensive service of micro-credit, savings generation, skill development and awareness education, and other necessary support for raising their income and employment opportunities and their level of empowerment (Berhan, 2011).

Table 4.9: The impact of participation in RUSACCO on woman’s income

Variable	Sample	Participants	Non-participants	Difference	Se	T-stat
Annual income	Unmatched	94885.90	71232.33	23653.57	598.76	39.50
	ATT	90278.18	81014.24	9263.94	364.45	25.42***

Source: Computed from survey data.

The sensitivity test is the final step used to investigate whether the causal effect estimated from the PSM was susceptible to the influence of unobserved covariates. The legitimacy of propensity score analysis is based on the assumption of strongly ignorable treatment assignment that assumes all relevant covariates are employed in the treatment assignment and the bias due to the unmeasured covariates is ignorable. The sensitivity result in (Table 4.10) shows that the impact result estimates are insensitive to unobserved selection bias. That means for all outcome variables estimated, at various level of critical values of gamma, the p-critical values are

significant. We could not get the critical value gamma where the estimated ATT is questioned even if we have set largely up to 10. Thus, we can conclude that our impact estimates (ATT) are insensitive to unobserved selection bias and are a pure impact of membership in RUSACCO on womanincome.

Table 4.10: Sensitivity Analysis

Outcomes	$e^\gamma = 1$	$e^\gamma = 1.5$	$e^\gamma = 2$	$e^\gamma = 2.5$	$e^\gamma = 3$
Total income	0	0	0	2.63×10^{-14}	3.15×10^{-12}

Source: Computed from survey data.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary and Conclusion

This study was carried out in Sinana district, Bale zone of Oromia national regional state. The study has identified the impact of RUSACCO on woman income in the study area. The primary data for this study were collected from 378 women from six rural Kebeles of the district using multistage sampling. The primary data collected from sampled women were analyzed using descriptive and econometric analyses.

Descriptive statistics results indicated that there is a significant difference between the participants and non-participants women in terms of marital status, participation in training, credit use, access to media, family size, education level, annual income, farm size, annual saving, distance from RUSACCO center and expenditure; whereas there was insignificant difference between the participants and non-participants women in terms of age and total livestock size in TLU. Furthermore, the survey data results implied that distance to the RUSACCO center, high interest rate, irregular general body meetings, lack of awareness on saving habit, lack of information, lack of knowledge, lack of proper saving, limited training opportunities, scattered settlement and weak educational status were major challenges of women to participate in RUSACCO; whereas lack of follow-up, untimely auditing, unclear and incompatible guidelines/rules, insufficient membership duration, low credit usage opportunity, limited amount of loan, weak management and inappropriate training schedule were the institutional problems hidden with credit providing agency.

Propensity score matching (PSM) method was employed to determine the impacts of RUSACCO on woman income in the study area. The logit model result showed that the impact of participation in RUSACCO was significantly influenced by eight explanatory variables. These variables were family size, distances from RUSACCO center and dependency ratio of woman were negatively affected, whereas the other five (i.e. marital status, educational level, participation in training, credit use and amount of loan borrowed) were positively affected woman's participation

in RUSACCOs. In the next stage, three matching algorithms (Nearest-Neighbor, Radius and Kernel) were used to estimate the income difference between participants and non-participants women. The impact estimation results then indicated significant differences in amount of income between participant and non-participantwomen.

The estimation result revealed that, on average, participation of women in RUSACCO have increased amount of annual income by 9263.94birr during the survey year. The estimated average treatment effect (ATT) showed that membership of women in RUSACCO has significant impact on income of participantwomen with significant t-statistic (25.42) at 5% significance level. The average amount of income of participantwomen was higher by 61.14 percent when compared with the average amount of income of non-participantwomen in the study area during survey year.

Finally, sensitivity analysis was carried out on the estimated average treatment effect using alternative matching estimators. When comparing with non-participants women,participants are found to have more income. The result of sensitivity analysis shows that estimated ATT for income (the outcome variable) is insensitive which clearly indicates its robustness.

5.2. Recommendations

Based on the findings of this study the following were recommended:

- Family size of women is negatively influenced participation of women in RUSACCO. To address this problem health office and other concerning body must give awareness on family planning. Women also try to improve their working habit and participates their active family labor on productive jobs in order to generate more income.
- Marital status of women is positively affects participation of women in RUSACCO. A married woman positively affects the probability of participation in RUSACCO. Therefore, the cooperative agencies give appreciation for married participantwomen to be continued with participants and create awareness for others in order to be participant of RUSACCO to increase their income more.
- Level of woman education was significant and positively affects the participation of women in RUSACCO. Therefore, due emphasis has to be given towards strengthening rural

women education at different levels and cooperative agencies give training in order to be participants of RUSACCO to increase their income for future use.

- Distance from RUSACCO center was significant and negatively affects the participation of women. This shows that the nearest women to RUSACCO center were more participants than far women. Therefore, the government and cooperative agencies open mini-RUSACCO center for those far from the RUSACCO center and cooperative development agent give more attention for those far distance living women.
- Access to training is significant and positively affects membership of women in RUSACCO. Training was one of the means by which women acquire new knowledge on the benefits of participation in RUSACCO. A major proportion of women had no formal education and knowledge in the usage of saving and credit; therefore cooperative agencies and cooperative development agents need to arrange training on its benefit.
- Credit use was significant and positively affects participation of woman in rural saving and credit cooperatives. This shows that those women who were the credit user over the last 12 months have developed experiences on how to use loan purposefully and how to make money easily from the available resources and become membership than non-credit users. Therefore, cooperative agencies and cooperative development agents create awareness for non-users of credit to be membership in rural saving and credit cooperatives by practicing in saving habit to be credit beneficiary.
- Amount of loan borrowed of women is positively influenced participation of women in RUSACCO. To address this problem, the cooperative agency must give attention to maximize the capital existing and try to give the amount that the member asking for. Women also try to improve their working habit and try to save more in order to generate more income.
- In general, the result of this study indicated that participation in RUSACCO have had a positive and significant impact on the total women annual income. Hence, the RUSACCO and other concerned body should give attention for rural women in the study area in order to enhance rural women's participation in the area.

The basic possible future policy implications that could be developed from this study are:

- ✓ The all the stakeholders need to improve the provision of short term as well as long term training for their experts in order to build their capacity and create awareness on benefits of rural saving and credit on the annual income of women.
- ✓ Some of the implementations of principles of RUSACCO are not well function in the study area due to weak management capacity. Therefore, cooperative agencies need to give attention in order to improve the implementations of cooperative principle using capacity building trainings.
- ✓ More households have no awareness on the benefits of rural saving and credit cooperatives. Therefore, concerned bodies including the district cooperative agencies and cooperative development agents as well as supporters of RUSACCOs need to create awareness for the society in order to be membership of rural saving and credit cooperative and get benefits of RUSACCO.
- ✓ The participation of women in membership of RUSACCO is low in the study area. Given the proportion of women in the society and their role in economic development, they should be encouraged to participate in rural saving and credit. Hence, the stakeholders should involve women in training to be membership in RUSACCO in order to improve their income.
- ✓ The government should give more attention in supporting rural saving and credit in order to improve the benefit of RUSACCO in the study area.

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Appendices

Appendix A: Questionnaires

QUESTIONNAIRES FOR PARTICIPANTS OF RUSACCO

This questionnaire was designed for a research to be conducted as part of the fulfillment to the requirement for MSc degree in Master of development economics. The title of the study is “The impacts of Rural Saving and Credit Cooperative (RUSACCOs) on women income in case of Sinana district Bale zone, Oromia regional state of Ethiopia”. The purpose of the study is to explore the impact of Rural Saving and Credit Cooperatives on improving participating women income. Participation in the study was voluntary; which was based on your own interest, the information you provide for this study were strictly confidential and used for an academic purpose only, your valuable input was crucial to achieve the purpose of the study and your honest and open response was greatly appreciated.

Respondent ID _____

Name of the Village _____

Name of the RUSACCOs _____

Signature of the enumerator _____

Date _____

Respondents' Background and Demographic Information

1. Age: _____
2. Marital status
 - A. Single
 - B. Married
 - C. Divorced
 - D. Widowed
3. Family size
 - A. 2
 - B. 3
 - C. 4
 - D. 5
 - E. > 5
4. Occupation
 - A. Farmer
 - B. Government employed
 - C. Self-employed
 - D. Merchant
 - E. Household wife
 - F. Other
5. Place of residence
 - A. Rural
 - B. Urban
6. Number of school age children
 - A. None
 - B. 1 to 3
 - C. 4 to 6
 - D. > 6
7. Education level of the respondent (years of schooling) _____

Part II: Information regarding RUSACCO

1. Distance to the RUSACCO office _____(km)
2. Have you been the participant of RUSACCO?
 - A. Yes
 - B. No
3. If answer Q1 is **Yes**, how many years have you been participant?
 - A. One year
 - B. Two years
 - C. Three years
 - D. Four years
 - E. ≥ 5 years
4. How did you become participant?
 - A. self-interest
 - B. Government enforcement
 - C. Participants Persuasion
 - D. Others (specify) _____
5. If answer Q3 is self-interest, from where did you get the importance of cooperation? _____
6. Why did you become a participant?
 - A. Access for credit
 - B. Savings
 - C. Increase bargaining power
 - D. Reduce marketing risks
 - E. Other(specify) _____
7. Social Participation
 - a. Is your household a member of Equb? A. Yes B. No
 - b. Is your household a member of Idir? A. Yes B. No
 - c. Is your household a member of health insurance? A. Yes B. No
 - d. Is your household user of social media (telephone, TV, other) A. Yes B. No
8. Do you own land?
 - A. Yes
 - B. No
9. Owned by the household? _____,
10. Since joining RUSACCO, did you increase farm holding?
 - A. Yes
 - B. No
11. What is your major means of income generation? _____
 - A. Agricultural product (on-farm)
 - B. Off-farm income
 - C. non- farm income
 - D. Others (specify)
12. Cash income from crop production in the last 12 months? _____kuntal_____unit price_____total
ETB birr
13. Income from off-farm activities in the last 12 months? _____(ETB)
14. Income from non-farm activities in the last 12 months? _____(ETB)
15. How many hectare of Farm land do you own? _____(Hek)
16. Average extension contact per-month? _____
17. Income from livestock production in the last 12 months? _____
18. Expenditure in the last 12 months? _____

No	Item	Amount (ETB)	Total
1	Consumption		
2	Education		
3	Emergency		
4	Farm(Agriculture input)		
5	Other(specify)		
Total			

19. The types of crop cultivated and livestock holding before and after joining the RUSACCO?

Crop cultivated	Before	After	Livestock holding	Before	After
Wheat			Sheep		
Teff			Goats		
Millet			Oxen		
Barley			Cows		
Maize			Bulls		
Sorghum			Donkey		
Beans			Horse		
Chick pea			Mules		
Lentil			Poultry		

20. Since joining saving and credit cooperatives, did you borrow loan?

- A. Yes B. No

21. If yes Q19, how much you have borrowed per year?

- A. Up to 1000 Birr C. >3000 to 5000
B. >1000 to 3000 D. Above 5000

22. Since joining saving and credit cooperatives, how many times borrowed?

- A. First times C. Third times E. More than fourth times
B. Second times D. Fourth times

23. For what purpose you borrowed the loan?

- A. Trade C. Service E. Consumption
B. Processing D. Agriculture F. Other (specify)

24. Have you utilized the loan for the purpose you borrowed?

- A. Yes B. No

25. If yes Q23, for what purpose utilized the loan?

- A. Consumption E. Land tax
B. Transportation F. Diversification)
C. Home improvement G. Other (specify) _____
D. Celebrations

26. Did you borrow loans for consumption purpose?

- A. Yes B. No

27. If yes Q25, how much you have borrowed so far? _____

28. How much is the interest rate RUSACCO charge for the loan you borrow? _____%/year

29. Did the credit bring significant change in your living standard?

- A. Yes B. No

30. If yes Q28, mention some of the observed changes in your living standard?

31. Are you late in repayments of credit?

- A. Yes B. No

32. If yes Q30, what are the reasons behind late in repayment?

- A. Negligence D. Un expected expenses
B. Payment period too short E. Low income
C. Un foreseen events F. Un profitable venture

- G. High family expenditure
H. Other reason, specify_____
33. Major economic activities, being carried out joining RUSACCO?
A. Single activity
B. Multiple activity
34. RUSACCO loan invested in which activities?
A. Existing business
B. New business
35. Do you have saving account in saving and credit cooperatives?
A. Yes
B. No
36. If yes Q34, what type of saving account do you have?
A. Voluntary saving
B. Compulsory saving
37. If yes Q34, what is the main reason for saving?
A. To avoid unwanted expenses
B. To have access to credit
C. Purchase of animals
D. Undertaking a new business
E. Excess income
F. Other, specify _____
38. How much you have saved so far in RUSACCO?
A. Up to Birr 1000
B. >1000 to 15000
C. >15000 to 2000
D. >2000 to 25000
E. Above 25000
39. Have you withdraw money from your saving account so far?
A. Yes
B. No
40. If yes Q38, how much you have withdrawn in your saving account?
A. Up to Birr 1000
B. >1000 to 15000
C. >15000 to 2000
D. >2000 to 25000
E. Above 25000
41.) If yes Q38, for what purpose money was withdrawn from your saving account?
A. Home improvement
B. Business expansion
C. Food clothing
D. Health needs
E. Education
F. Household appliance
G. Celebrations
H. Transportation
I. Other, specify _____
42. If you did not have access service from the cooperatives, how do you equip yourself to meet the changing needs?

Scenario without RUSACCOs	Put a check(*) against the statement
Not able to acquire goods	
Would still purchase	
Borrow from families/friends	
DECSI	
Conventional banks Revenue	

43. Does your income increase after joining the RUSACCO?
A. Yes
B. No
44. Annual income before and after intervention?
A. Pre-RUSACCO: _____ (amount in birr)
B. Post-RUSACCO: _____ (amount in birr)
45. Do you get any profit from income generating activity after joining the RUSACCO?
A. Yes
B. No
46. If yes Q44, what would you like to see done with the profit funds in your business?
A. Invest it back to RUSACCO
B. Modernization of operations
C. Financing of new services
D. Household consumption

57. If yes Q55, what type of training have you received so far?

Nature of training	Put a check (*) against the statement
Auditing	
Record keeping system	
Risk and investment management	
Personnel management	
Proper use of credit	
Habit of saving	
Cooperative ethos and philosophy Legal cases	
Legal cases	

58. If yes Q55, who organized the training?

- A. Cooperative C. NGOs E. Others, specify____
 B. Government D. Universities

59. If yes Q55, what advantages do you get from the training?

60. Have you lent money to someone (participants, or non-participants) after joining RUSACCO?

- A. Yes B. No

61. If yes Q59, how much you have lent?

- A. Up to 1000Birr C. >5000 to 10000
 B. >1000 to5000 D. Above 10000

62. Do you think your household burden decrease after joining the RUSACCO?

- A. Yes B. No

63. If yes Q61, put a check (*) against the statement give in the following table

Household Activities	Activities the women were participating	
	Pre-RUSACCO	Post-RUSACCO
Child care		
Cooking		
Fuel wood collecting		
Grinding		
Livestock herding		
Cleaning(homes and clothes)		
Petty business		
Farming		

64. How do you perceive your participation in attendance of training after joining the RUSACCO?

- A. Decreased B. Unchanged C. Increased

65. How do you perceive your level of involvement in meetings after joining the RUSACCO?

- A. Decreased B. Unchanged C. Increased

66. How did you perceive your participation in social related activities after joining the RUSACCO?

- A. Decreased B. Unchanged C. Increased

67. How did you perceive your participation in income generating activities after joining the RUSACCO?

- A. Decreased B. Unchanged C. Increased

68. Perception of the functions and activities of RUSACCO. Put a check (*) against the statement

Functions	Agree	Disagree
Bringing savers and borrowers in a system		
To take participants savings in the appropriate amounts and times		
Lend money to the participants for use in the business		
Recover all the loans given as credit		
Charge interest		
Pay the interest on their savings		
To allow participants to form a business		
Selling shares to participants in appropriate amount and times		
Retaining some profit from interest earned on the lending operation		
Pay dividend to the participants on the basis of the shares owned		
Shares		
Open deposit Fixed deposit Participation		
Internal transfer facilities		
Transfer facilities between RUSACCO and Bank		
Deposit of cash cheques and cheques made out of a participants		
Credit collection services to other institutions		
Installment collection on behalf of other institutions		
Premium collection on behalf of insurance institutions		

69. List all value of additional assets purchase it after joining the RUSACCO?

70. So far, what types of problems have been there those hinder expansion of saving and credit cooperatives?

Problem	Agree	Disagree
Lack of finance of the RUSACCOs		
Lack of knowledge in the line of income generating activities		
Lack of information in the line of income generating activities		
Limited training opportunities available to RUSACCO participants		
Participants' not actively participate in the management of their societies		
Weak management capacity		
Unsatisfactory or inadequate representation of women participants in management bodies of the cooperatives		
Participants' weak business management capacity and lack of business diversification opportunities		
Short loan repayment period		
Small account size of loans offered by RUSACCOs		
Lack of record keeping system		
Poor saving habits of participants		

71. What are your general suggestions to improve the functioning of RUSACCO?

INTERVIEW QUESTIONS FOR NON-PARTICIPANTS

This questionnaire was designed for a research to be conducted as part of the fulfillment to the requirement for MSc degree in Master of development economics. The title of the study is “The impacts of Rural Saving and Credit Cooperative (RUSACCOs) on women income in case of Sinana district Bale zone, Oromia regional state of Ethiopia”. The purpose of the study is to explore the impact of Rural Saving and Credit Cooperatives on improving participating women income’. Sample size included in non-participate was half of total sample of study 378. That mean 189 respondents from six Kebele (six RUSACCOs). Participation in the study was voluntary; which was based on your own interest, the information you provide for this study were strictly confidential and used for an academic purpose only, your valuable input was crucial to achieve the purpose of the study and your honest and open response was greatly appreciated.

Respondent ID _____

Name of the Village _____

Name of the RUSACCOs _____

Signature of the enumerator _____

Date _____

Respondents' Background and Demographic Information

1) Age: _____

2) Occupation:

A. Crop production

E. Manual Worker

B. Livestock rearing

F. Housewife

C. Both crop & livestock

G. Civil Servant

D. Trading/merchant

3) Marital status:

A. Married

B. Unmarried

C. Divorced

D. Widowed

4) Educational status: a)

A. Illiterate

D. Junior school

G. College/University

B. Literate

E. High school

H. Religion education

C. Elementary school

F. College preparatory

5) Number of school age children

A. None

B. 1 to 3

C. 4 to 6

D. > 6

6) Education level of the respondent (years of schooling) _____

Information Regarding RUSACCO

1) Distance to the RUSACCO office _____ (km)

2) Social Participation

a. Is your household a member of Equb? A. yes B. No

b. Is your household a member of Iddir? A. yes B. No

c. Is your household a member of health insurance? A. yes, B. No

d. Is your household user of social media (telephone, TV, other) A. yes, B. No

- 3) What is your major means of income generation? _____
 A. Agricultural product(on-farm) C. Non- farm income
 B. Off-farm income D. Others (specify)
- 4) Cash income from crop production in the last 12 months? _____ kuntal_____unit
 price_____total ETB birr
- 5) Income from off-farm activities in the last 12 months?_____
- 6) How many hectare of Farm land do you own? _____
- 7) Average extension contact per month?_____
- 8) Did you own livestock? A) No B) Yes

S/N	Types of livestock	Number owned	Number sold	Unit price	Total price
1	Oxen				
2	Cows				
3	Heifers				
4	Calves				
5	Donkey				
6	Goat				
7	Camel				
8	Chicken				
9	Other				
Total					

- 9) Income from livestock production the last 12 months? _____
- 10) Expenditure in the last 12 months?_____

No	Item	Amount (ETB)	Total
1	Consumption		
2	Education		
3	Emergency		
4	Farm(Agriculture input)		
5	Other(specify)		
Total			

- 11) Why you are not joined RUSACCO in your locality?

S/No	Challenges/problem	Agree	Disagree
1	Distance to the RUSACCO office		
2	High interest rate		
3	Irregular general body meetings		
4	Lack of awareness on saving habit		
5	Lack of information		
6	Lack of knowledge		
7	Lack of proper saving		
8	Lack of road access		
9	Limited training opportunities		
10	Limited loan amount available from RUSACCOs		

11	Scattered settlement		
12	The RUSACCO are not audited in time.		
13	Get serves from other financial institution		
14	Weak management capacity		

12) Have you ever thought of joining the RUSACCO?

A. Yes

B. No

13) Do you perceive that RUSACCO are helpful to participants?

A. Yes

B. No

14) What suggestions you have to make to get more people to participants of RUSACCO?

15) What are the major problems/challenges that the women saving and credit cooperative faced?

16) Unless you have not joined RUSACCO in your locality, how you fill your capital shortage?

17) What do you think about the impact of RUSACCO in entire life of the community?

18) Do you have saving account in any legal institution?

A. Yes

B. No

19) If Q#8 is yes, how money birr did you save per year?

A. Up to 1000 birr

C. >5000 to 10000

B. >1000 to 5000

D. Above 10000

20) Did you borrow money from bank? A. Yes B. No

21) If yes Q20, from which bank or MFI? (Multiple answers is possible)

A. Commercial bank

D. Oromia international bank

B. Oromia cooperative bank

E. Other (specify)

C. Sinke bank

22) Yet, did you increase farm holding? A. Yes B. No

23) Do you think that RUSACCO have positive impacts on the women entire life? A. Yes B. No

24) If yes Q#23, could you list some of them that you have been observed so far?

PART III: INTERVIEW QUESTIONS FOR FOCUS GROUP DISCUSSION

This questionnaire was designed for a research to be conducted as part of the fulfillment to the requirement for MSc degree in Master of development economics. The title of the study is “The impacts of Rural Saving and Credit Cooperative (RUSACCOs) on women income in case of Sinana district Bale zone, Oromia regional state of Ethiopia”. The purpose of the study is to explore the impact of Rural Saving and Credit Cooperatives on improving participating women income’. Participation in the study was voluntary; which was based on your own interest, the information you provide for this study were strictly confidential and used for an academic purpose only, your valuable input was crucial to achieve the purpose of the study and your honest and open response was greatly appreciated.

Respondent ID _____

Work office _____

Department (Responsibility) _____

Signature of the enumerator _____

Date _____

Part I: Respondents Background and Demographic Information

1. Age: _____ (year)
2. Sex _____ A. male B. female
3. Marital status
A. Single B. Married C. Divorced D. Widowed
4. Family size
A. 2 B. 3 C. 4 D. 5 E. >5
5. Occupation
A. Farmer C. Self-employed F. Other
B. Government employed D. Merchant E. Household wife
6. Place of residence _____
7. Education level _____ (year of schooling)

Part II: Regarding RUSACCO membership and institutional factor Discussions Points

1. Are women have an interest to be the member of RUSACCO? A. Yes B. No
2. Do you think that there is economic difference among participant and non-participant?
A. Yes B. No
3. Did you give training for participants of women saving and credit cooperative group?
A. Yes B. No
4. Who take the responsibility for the success and failure of women rural saving and credit cooperative group? (Multiple answer is possible)
A. Kebele women cooperative participants
B. Government (Cooperative office)
A. Women and children affairs
B. Others (specify) _____
5. Do you think that economical empower of women can change the living standard of the community?
A. Yes B. No
6. As you think, in what situation participants of RUSACCO participate more than non-participant of RUSACCO? (Multiple choice is possible)
A. Agricultural technology adaptation, Mgmt, road, water supply project
B. Social contact (equb, idir, other)
C. Political decision
D. Community participate project like water shed
E. Community meeting and governmental administration
7. What suggestions do you have to increase the participants of RUSACCO?

8. What improvements RUSACCO should made in order to overcome the existing problems?

9. Do you think that the participants are using the advantages of RUSACCO in appropriate way?

A. Yes B. No

10. If No Q9, what reasons can be suggested:

11. What positive impacts that you have been observed from the participants of RUSACCO?

12. What do you think about the impact of RUSACCO in entire life of the community? Specially, by improving social and economic empower of women?

13. As a general, among the following reasons on which you agree that why more women are not participants of RUSACCO in their kebele?

S/No	Challenges/problems	Agree	Disagree
1	Distance to the RUSACCO office		
2	High interest rate		
3	Irregular general body meetings		
4	Lack of awareness on saving habit		
5	Lack of information		
6	Lack of knowledge		
7	Lack of proper saving		
8	Lack of road access		
9	Limited training opportunities		
10	Limited loan amount available from RUSACCOs		
11	Scattered settlement		
12	The RUSACCO are not audited in time.		
13	Get serves from other financial institution		
14	Educational level		
15	Weak management capacity		

Appendix B: Survey Data Outputs

```
| IMPMEMRU   Age   EducOccupMarStatFamSize Training  Media Distance  member ExpenditCredit~eSocial~tLivest~k
-----+-----
IMPMEMRU| 1.0000
    Age| -0.1287 1.0000
Educ| 0.0995 -0.5505 1.0000
Occup| 0.0682 -0.1478 0.0870 1.0000
MarStat| 0.0832 -0.1288 0.1205 0.0278 1.0000
FamSize| -0.1743 0.0355 -0.5415 -0.0819 -0.1575 1.0000
    Training| 0.1083 0.0277 0.1497 0.0429 0.1245 -0.1407 1.0000
        Media| 0.0093 0.0144 0.0731 0.0390 0.0038 -0.0634 0.0916 1.0000
            Distance| -0.0436 0.0993 -0.1539 -0.0423 -0.1507 0.2004 -0.2867 -0.0801 1.0000
member| 0.1780 -0.0892 0.2831 0.1008 0.2040 -0.3112 0.5715 0.1128 -0.5084 1.0000
Expendit| 0.0947 -0.1105 0.0833 0.0468 0.0464 -0.1283 0.1444 0.0064 -0.0341 0.1936 1.0000
Credituse| 0.4035 -0.0651 0.1499 0.0199 0.1312 -0.1701 0.3280 -0.0520 -0.1713 0.4597 0.3517 1.0000
SocialPart| 0.0063 0.0389 0.0931 0.0243 -0.0018 -0.0064 0.0927 0.0416 -0.1293 0.1657 -0.0003 0.0506 1.0000
    Livestock| 0.0679 -0.1022 0.1033 0.1091 0.1076 -0.1539 0.2269 0.0478 -0.1967 0.3785 0.5727 0.3474 0.1415 1.0000
FarmSize| 0.0701 -0.0986 0.1616 0.0510 0.1062 -0.1718 0.2907 0.0459 -0.2445 0.4920 0.0600 0.4337 0.0849 0.0598 1.0000
    Saving| 0.0365 -0.0971 0.1185 0.1094 0.1113 -0.1714 0.1777 0.0746 -0.1419 0.3131 0.0117 0.3601 0.0625 0.0776 0.0598 1.0000
dependency| -0.1574 0.0543 -0.0239 -0.0755 -0.0615 0.0622 -0.1013 -0.0089 0.1924 -0.2312 -0.1252 -0.1341 0.0185 -0.1252 0.0598 0.0598 1
```

Source: survey data output (2022G.C)

Appendix Table II: AIC and BIC comparison of the models under consideration

Akaike's information criterion and Bayesian information criterion						
Model	Obs	ll(null)	ll(model)	Df	AIC	BIC
Logit	378	-315.125	-69.25	14	151.212	333.012
Probit	378	-315.125	-70.823	14	152.645	333.976

Source: survey data output (2022G.C)

Appendix Table III: Estimation of the propensity score

Logistic regression			Number of obs= 378			
			LR $\chi^2(12) = 123.61$			
			Prob > $\chi^2 = 0.000$			
Log likelihood = -69.25			Pseudo $R^2 = 0.817$			
Variables	Coef.	Se	Z	P>z	[95% Conf.Interval]	
Age	-0.0182	0.022	-0.8273	0.534	-0.06132	0.02491
Family size	-0.3114	0.101	-3.083	0.006	-0.50936	-0.1134
Marital status	1.6251	0.081	1.998	0.028	1.46634	1.78386
Education status	0.2622	0.094	3.014	0.013	0.07798	0.44644
Livestock	0.2091	0.151	1.385	0.169	-0.0868	0.50506
Farm size	0.8324	0.463	0.201	0.863	-0.0751	1.73988
Distance from RUSACCO	-0.7013	0.344	-2.039	0.048	-1.3755	-0.0271
Part. In training	1.1021	0.072	1.640	0.023	0.96098	1.24322
Credit use	2.4032	0.5632	4.267	0.001	1.29933	3.5071
Dependency ratio	0.6723	0.1822	3.689	0.001	0.31519	1.0294
Part. sass	-0.2942	0.5142	-0.572	0.351	-1.30203	0.71363
Annual saving	1.6025	1.8123	0.884	0.461	-1.94960	5.15461
Annual expendit.	-0.0414	0.9451	0.044	0.324	-1.89380	1.8110
Amount loan	0.41324	0.0662	6.242	0.000	-0.28349	0.54299
Cons	-12.321	7.261	-1.696	0.074	-26.5525	1.91056

Source: survey data output (2022G.C)

Appendix Table V: Marginal effects after logit

Variable	dy/dx	Std. Err.	Z	P>z	[95% Conf.interval]		X
Age	-0.0031	0.00691	-0.54	0.587	-0.01729	0.009791	41.0542
Family size	-0.0523	0.02317	-2.63	0.008	-0.1064	-0.01558	5.02712
Marital~s*	0.2684	0.0775	3.59	0	0.12632	0.430106	0.908475
Education	0.0684	0.01858	3.13	0.002	0.021679	0.094494	4.42342
Livestock	0.0373	0.03509	1.35	0.178	-0.02153	0.115997	7.78305
Farmsize	0.0192	0.10366	0.17	0.864	-0.18538	0.220974	1.43559
Distance~O	-0.1421	0.07249	-2.1	0.036	-0.29428	-0.01013	1.65339
Training	0.2202	0.11032	1.97	0.048	0.001598	0.434029	0.691525
Credituse~y*	0.3803	0.08923	5.42	0	0.308675	0.658438	0.538983
DependencyR	0.0971	0.0143	6.789	0	0.38775	0.768426	0.638773
Partsass*	-0.0704	0.113	-0.61	0.542	-0.29037	0.152581	0.450847
Annual sav	0.3563	0.21592	1.6	0.11	-0.07764	0.768761	11.1171
Annual exp.	-0.031	0.2094	-0.05	0.963	-0.42021	0.400618	10.9707
Amount loan	0.0732	0.01275	6.48	0	0.057664	0.107645	4.67342

y = Pr(IMPMEMRUS) (predict) = .34832765

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Source: survey data output (2022G.C)

Appendix Table VI: Results of sensitivity analysis on ATT of outcome variable

Gamma	sig+	sig-	t-hat+	t-hat-	CI+	CI-
1	0	0	0.5	0.5	0.5	0.5
1.5	0	0	0.5	0.5	0.5	0.5
2	2.20E-16	0	0.5	0.5	-4.30E-07	0.5
2.5	1.50E-13	0	-4.30E-07	0.5	-4.30E-07	0.5
3	1.40E-11	0	-4.30E-07	0.5	-4.30E-07	1
3.5	3.50E-10	0	-4.30E-07	0.5	-4.30E-07	1
4	4.10E-09	0	-4.30E-07	1	-4.30E-07	1
4.5	2.70E-08	0	-4.30E-07	1	-4.30E-07	1
5	1.30E-07	0	-4.30E-07	1	-4.30E-07	1
5.5	4.40E-07	0	-4.30E-07	1	-4.30E-07	1
6	1.20E-06	0	-4.30E-07	1	-4.30E-07	1
6.5	3.00E-06	0	-4.30E-07	1	-4.30E-07	1
7	6.50E-06	0	-4.30E-07	1	-4.30E-07	1
7.5	0.000013	0	-4.30E-07	1	-4.30E-07	1
8	0.000023	0	-4.30E-07	1	-4.30E-07	1
8.5	0.000038	0	-4.30E-07	1	-4.30E-07	1
9	0.00006	0	-4.30E-07	1	-4.30E-07	1
9.5	0.000091	0	-4.30E-07	1	-4.30E-07	1
10	0.000133	0	-4.30E-07	1	-4.30E-07	1

* gamma - log odds of differential assignment due to unobserved factors

sig+ - upper bound significance level

sig- - lower bound significance level

t-hat+ - upper bound Hodges-Lehmann point estimate

t-hat- - lower bound Hodges-Lehmann point estimate

CI+ - upper bound confidence interval (a= .95)

CI- - lower bound confidence interval (a= .95)

Source: survey data output (2022G.C)