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**WOMEN AND MICRO FINANCE: THE CASE OF  
WOMEN FUEL WOOD CARRIERS IN ADDIS ABABA**

**BY  
RETTA GUDISA**

**DECEMBER, 2000  
ADDIS ABABA**

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WOMEN FUEL WOOD CARRIERS IN ADDIS ABABA**

A thesis Submitted to the School of Graduate Studies, Addis Ababa University in  
Partial Fulfilment of the Requirement for the Degree of Master of Science in  
Economic Policy Analysis

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## ABBREVIATIONS

FDRE	=	Federal Democratic Republic of Ethiopia
FWFCA	=	Former Women Fuel Wood Carriers Association
GMFSC	=	Gasha Micro financing Share Company
ILO	=	International Labour Office
MEDaC	=	Ministry of Economic Development and Co-operation
MoLSA	=	Ministry of Labour and Social Affairs
PCS	=	Pilot Credit Scheme
UNECA	=	United Nations Economic Commission for Africa
WFC	=	Women Fuel Wood Carriers
CSA	=	Central Statistical Authority
AAU	=	Addis Ababa University

## ACKNOWLEDGEMENTS

I do realise that the thesis would not have been completed without the co-operation of many people. As there is no enough space to mention all of these individuals, I would like to convey my words of "thanks" to them all.

My special thanks go to Dr. Tekie Alemu for his in valuable advice and constructive comments in the course of writing the thesis. Above all, I would like to thank Mr. Ahmedin Ibrahim and Mr. Damoze Mamme, the former and the current president of Oromia Supreme Court respectively, for allowing me to join this program and proceed with my study. Furthermore I would like to thank Dr. Alemu Mekonnen and Dr. Dejene Aredo for providing me the necessary material for the study.

No word of thanks is sufficient to appreciate what my colleagues Shiferaw Degefa, Tadesse Ababu and Adem Kedir have done for me. Also, I would like to extend my special thanks to my classmate Astatke W/Mikaeal with Daniel Zerfu, second year MSc student, for their kind co-operation throughout the study period. Mr. Teshome Yohannes, General Manager of Busaa Gonnofaa Micro financing Share Company with Mr. Dirriba Hordofa, Assistant Manager of the same institution deserve special thanks for their helpful and constructive comments.

A special debt of gratitude is owed to my beloved Mulunesh Lemmi, to my parents and relatives and to Bedane Abele for they are always with me in this hard time. My thanks also go to all the staff of GMFSC and WFCs project for their moral and material support that they have provided me in the course of the study. Furthermore, I would like to thank my friends Getahun Bedane, Kumsa Lemmesa and Abebe Feyisa for the moral and material encouragement they have provided me in the study period. Moreover, I cannot forget to thank Chuchu Guta and Abebech Demissie for the material and secretarial services that they have provided me in writing the thesis. Finally, I would like to thank all the staff of the AAU Economics Department for their co-operation through out the study period and the African Economic Research Consortium for it provided me with the financial support to carry out the study.

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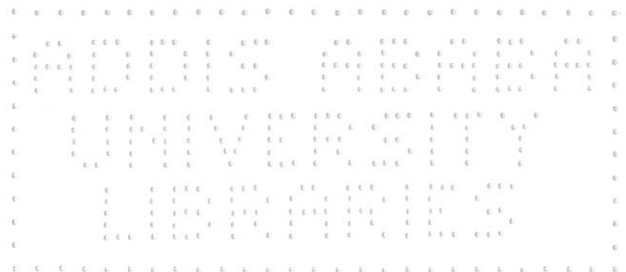
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## ABSTRACT

*This study has two parts. The first part analyzes the impact of micro finance on the living and working conditions of women fuel wood carriers (WFCs). Descriptive statistical analysis, using primary data collected from a sample of 130 individual WFCs who are/were beneficiaries in either credit schemes, is employed in this part of the study. While assessing this impact it also examines whether micro finance can reduce the pressure that WFCs exert on the forest stock of the trees surrounding the city of Addis Ababa. The second part of the study, based on the above data, examines determinants of loan repayment performance by using a probit model.*

*The results of the study indicate that the credit schemes have brought positive impact in improving the living and the working conditions of these women, thereby enhancing their economic empowerment. This is reflected in the rise of their income, expenditure and in their shift to other alternative income generating activities after the loan rather than engaging in fuel wood collecting, carrying and selling activity.*

*The study also indicates that micro finance only couldn't stop these women from degrading the forest stock of the city as those women fuel wood carriers who do not have access to credit continue with this activity. Hence, integrating these women into forest management or fuel wood plantation on the one hand and the provision of micro finance services to those WFCs who are in need of credit on the other hand would be essential to resolve these problems. Moreover, to minimize further drop out of the member and to operate in a sustainable manner, Gasha Micro financing Share Company (GMFSC) should have to carefully examine in its lending strategy the reasons for the increased dropouts of its beneficiaries and search a solution for the operational problems faced by them in running their business.*

*The determinants of loan repayment performance as estimated by the binomial probit model indicates that educational level is negatively related to loan repayment performance while frequency of loan (repeat borrowers), supervision, suitability of repayment installment period and other income sources are found to encourage repayments and reduce the probability of loan default. Hence, these repayment enhancing factors and other variable that affect repayment performance negatively should be considered by GMFSC in designing a more effective loan repayment mechanism for its beneficiaries.*

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Statement of the Problem

Ethiopia is one of the poorest countries in the world. According to the report by MEDaC (1999a: 17), 45 percent of the population is absolutely poor, i.e., they are unable to lead a life fulfilling the minimum livelihood standard. Population pressure, unemployment, drought, famine, war and environmental degradation were some of the fundamental problems that the country has experienced in the past. Regarding poverty in Addis Ababa, Goitom (1996: 232) showed that the percentage of the population affected by primary (food) poverty rose from 35.3% in 1990 to 48.4% in 1992. He further pointed out that the rate of unemployment, which was 22.3 percent in 1992 increased to 27.1 percent in 1995.

Mekonnen (1996: 216) also pointed out that a higher percentage of population lives in abject poverty. In his study of seven major urban areas in Ethiopia he indicated that nearly 39% of the population are below the food poverty line. He also found that 44.2 percent of the Addis Ababa population lives below the food poverty line. Social problems such as unemployment, prostitution, street children, population pressure and others are common and increasing problems of the city. In addition, Addis Ababa absorbs and shelters a large number of migrants who come to the city in search of job. This in turn would increase the number of unemployed poor and adds more to the already growing population of the city.

In addition to social, environmental, infrastructural and other policy measures, the government of Ethiopia has taken fundamental economic reforms to alleviate poverty and to boost economic growth that has resulted in a higher growth rate of real GDP (Gross Domestic Product). Annual

growth rate of GDP at current market prices for the year 1992/93-1997/98 is 11.1%(MEDaC, 1999b: 43). However, poverty continues to affect the majority of Ethiopian population.

The extensive nationalisation measures of the previous regime had highly reduced the number of the once growing private formal sector employment and results in the expansion of the informal sector employment in urban Ethiopia (MEDaC, 1999b: 139). The backward and poorly performing agricultural sector is one of the major factors that led to the increased migration from rural to urban particularly to the capital city-Addis Ababa. This may contribute to the expansion of the informal sector employment in the economy in the absence of alternative means of survival. The reform measures undertaken by the government such as the public enterprise reform has also resulted in some laid-off workers who also increased the number of people joining the already growing informal sector in response to the stagnating formal sector.

With high unemployment, and small absorptive capacity of the formal sector due to the above reasons, the only sector open to the urban poor is the informal sector. The concept of informal sector has no specific definitions that will have universal validity and acceptance. Heyzer (1981: 3) used the concept to refer to economic activities that are characterized by:

- (a) non-permanence and casualness of employment;
- (b) lack of rules and regulations;
- (c) reliance on family labour and small-scale establishments (micro enterprises).

Fidler and Webster (1996: 6) in their study of the informal sectors of West Africa considered the informal sector as a sector that includes very poor people who work part-time in various non-farm, income generating activities (Survivalists); self-employed people who produce and

purchase goods for sale, cater services; and very small (micro) businesses that usually operate from a fixed location with more or less regular hours. According to Bekele (1996: 282), the informal sector embraces those enterprises involved in different business activities of which the majorities are unlicensed, unprotected and unregulated. A recent study by Mulat and Wolday (2000:95) described the informal sector as a sector characterised by:

- (a) ease of entry;
- (b) reliance on indigenous resources;
- (c) family ownership of enterprises;
- (d) small-scale operation;
- (e) labour intensive and adapted technology;
- (f) skill acquired outside the formal school system; and
- (g) unregulated and competitive markets.

The 1996 CSA survey result indicates that a total of 730,969 persons were employed under the informal sector in urban Ethiopia and women account for about 65% of urban informal sector (MEDaC, 1999b: 139-140). For Addis Ababa, the informal sector employs about 166,303 persons and constitutes 51% of the economically active population (MEDaC, 1999b: 140). Neglecting this sector, which is a source of employment for many poor people, particularly for poor women, would retard the development of the country as it underestimates the role of women in the development of the national economy. Moreover, if credit is not provided to these informal sector operators, it is not possible for them to utilise the excess labour and resources that could raise their income and savings and thus unable to break the poverty line (Bekele, 1996: 304).

Generally, the informal sector operators lack resources, capital and skill to run their businesses and finally end up in poverty (Berger, 1989: 1017). They have limited access to credit from the formal financial markets. Lack of collateral is one of the major problems of the poor, particularly of poor women, in constraining them from getting access to credit facilities of the formal financial institutions (Berger, 1989: 1023).

To address such challenges, Grameen Bank in Bangladesh adopted an innovative banking mechanism for the poor in order to achieve its poverty alleviation objective. 'It was started as a project in 1976 by Muhammad Yunus, a university professor, and finally came into existence in 1983 through government's ordinance' (Karim and Osada, 1998: 264). The bank provides micro credit for the poor to assist them to increase their income through self-employment so as to overcome poverty and to encourage social development such as savings, functional education training, health care, family planning, child education etc (Karim and Osada, 1998: 264). It is now the largest credit institution in Bangladesh and has been replicated world wide in developing as well as developed countries as an effective tool for poverty reduction. 'Faced with the failure of the earlier adopted "trickle-down" approach for reducing poverty, the micro credit approach regarded as "trickle-up" approach has created a new hope in poverty alleviation' (Karim and Osada, 1998: 257). The former approach, which emphasizes that growth should descend from top to the bottom, is not as successful as the latter, which believes that growth should be initiated first at the micro level through directly targeting the poor from below there by contributing to growth at the macro level (Karim and Osada, 1998: 257).

Recently, both our government and NGOs seem to have accepted micro credit as a tool for poverty alleviation. This is reflected by the proclamation issued for the establishment and supervision of micro financing institutions (FDRE Proclamation No. 40/1996: 245-252) in 1996

and by the increase in the number of the licensed micro financing institutions from that time onwards.

Following the footsteps of Grameen Bank, some NGOs in Ethiopia provided micro credit to the poor who are not bankable and have no access to the formal banks. Some of these NGOs, which include the Relief Society of Tigray, Ethiopian Relief Organization, Redd Barna, National Women's Association for Development and Action Aid Ethiopia have tried to extend credit to poor households in some parts of the country (Mengistu, 1997: 5).

In 1990, an urban micro financing scheme was initiated on a national scale with a credit agreement signed between the government of Ethiopia and the International Development Association (IDA) aiming at financing the Market Towns Development Project, planned to improve infrastructure in towns considered as market and service centres for the agricultural hinterland and to alleviate poverty in the selected sixteen towns of the country (Befekadu and Berhanu, 1999/2000: 330). The number of towns has currently grown to fifty-nine and is expected to increase in the future (Befekadu and Berhanu, 1999/2000: 331). To this date, there are about thirteen micro financing institutions that have been legally registered and started delivering micro finance services in Ethiopia (Wolday and Middlebrook, 2000: 3).

The majority of the poor who engage in informal sector activities in urban areas, particularly in Addis Ababa, are women. They engage in productive and reproductive work and have no time to devote to skill up grading or education (Hayat, 1997: 16). Hence, there are a few women in professional, technical and administrative field, which would mean that they have little access to employment opportunities in the formal sector. Most of their trade (informal) activities are illegal or unlicensed and are carried out on the street with out premises (Hayat, 1997: 17). As the

majority of them have no asset for collateral, they are also discriminated by the formal financial institutions in getting access to credit. Therefore, since poor women face many hardships in various perspectives as compared to their male counterpart, priority should be given for them so as to alleviate poverty and improve theirs' and their families' livelihood. Among the women who engage in informal sector activities, the WFC's situation is even more serious. They are among the poorest urban dwellers and the majority (60%) of them are their families' sole income earners [Hailu and Hall, 1995: 2]. Fikerte (1988-1991: 1-94) identified the miserable living and working condition of the WFCs in Addis Ababa and brought it to the attention of the public in an attempt to seek a remedial solution to the problem.

In the major urban centres of the country, thousands of women earn their living from the collection and sale of fuel wood. According to Hailu and Hall (1995: 2) it is estimated that in Addis Ababa alone there are more than 15,000 Women Fuel Wood Carriers. They supply about 30% of the city's domestic fuel wood needs (Hailu and Hall 1995: 2). They operate under harsh working conditions and are among the poorest population of the city. The activity of WFCs, which includes collecting, carrying and selling fuel wood, is backbreaking and tiresome. A WFC travels an average of 30 km round trip to collect a bundle of fuel wood (Fikerte, 1988-1991: 23). She starts this task early in the morning before sunrise and carries an average of 35 kg on her return journey until she finds a buyer (Hailu and Hall 1995: 2). For such work, a WFC gets a minimal amount of income, which is not proportional to her effort. It is estimated that the average monthly income of a WFC ranges between Birr 3.50 to Birr 7.00 per bundles [Hailu and Hall, 1995: 2]. The rapid deforestation and increased population growth have resulted in the rise of fuel wood prices (Tegegne, 2000: 76).

Due to the heavy bundle they carry each day, most of them are suffering from spinal cord injuries, broken chest or leg, back pain, miscarriage, heart attack, asthma, sever headache etc (Fikerte, 1988-1991: 5). Moreover, since the forest from which they collect fuel wood is owned by the state, they face violence and harassment by forest guards (Fikerte, 1988-1991: 5). Their bundles may be confiscated or they may have to pay some money for the guards to save their bundle from being taken away.

In Addis Ababa, biomass fuels meet 43% of the demand for fuel, which fulfils a substantial portion of the city's energy demand (Region 14 Administration, cited in Tegegne, 2000: 76). Furthermore, in his study of urban poverty and the environment, Tegegne (2000: 76) pointed out the clearance of most of the city's natural forests mainly to meet the energy demand of the city and the acceleration of its removal by these urban poor women who rely on income obtained from the sale of firewood.

These miserable working and living condition of the WFCs and the negative impact they endure on the forest stock surrounding the city of Addis Ababa motivated the implementation of the ILO/ MoLSA/ WFCs project (or alternatively WFCs project) in February 1994. It is so named because ILO implemented the project in collaboration with the Ministry of Labour and Social Affairs. The project started assisting the WFCs engage in group-based alternative income generating activities that are physically less damaging and financially more rewarding than fuel wood carrying and selling. It aimed at creating a balance in the conflicting needs of the WFCs, urban fuel wood demand and supply and sustainable forest resource management (Hailu and Hall, 1995: 2).

Since it is impossible to create employment opportunities for all of WFCs through group-based income generating activities, the WFCs project initiated a pilot credit scheme in December 1996 through which the beneficiaries can get access to credit and engage in alternative income generating activities. In January 1996, the Netherlands Government granted funds totalling US \$ 268,750 to the women fuel wood carriers project. The implementation period of the scheme was 24 months. Out of the total amount, US \$ 200,000 represented the loan fund capital; the remaining (23%) was an allocation for preliminary research, design preparation, training and some basic administrative costs.

The pilot credit scheme continued its operation until the National Bank of Ethiopia by its public notice no. MFI 2/98 prohibited all unlicensed micro-financing undertakings from conducting such activities. As a result, the Gasha Micro Financing Share Company (GMFSC), an independent micro finance institution legally established on May 15,1998 under the auspices of Pro Pride (a local NGO)- was identified as a suitable partner for the continued operation of the Pilot Credit Scheme (PCS). GMFSC, based on the partnership agreement made with Former Women Fuel Wood Carriers Association (FWFCA) -an association established for protecting the rights of WFCs, took over the financial administration of the scheme and started to provide credit to WFCs beginning from 1999 after the suspension of WFCs pilot credit scheme. Currently its total capital is Birr 1,691,026.10, which is the sum of loanable revolving fund and paid up capital from shareholders.

The common objective of both WFCs pilot credit scheme and GMFSC is to assist their respective beneficiaries to develop viable and profitable income generating activities and provide them with credit for their implementation. Unlike the WFCs pilot credit scheme, which is open only for women who derive a major part of their income from fuel wood collecting, carrying and

selling, GMFSC includes women and men who are not fuel wood carriers as its beneficiaries in addition to those who are. This is essential because with few beneficiaries as that of PCS the company may not be sustainable, as the cost per unit of service would be too high. The excess capacity should have to be filled for the sake of operational efficiency and revenue generation. Credit is provided in each of the four branches of the WFCs project, namely, Entoto, Yeka, Kolfe and Keranyo, which are now considered by GMFSC as centres or unions under the Kolfe branch.

The methodology followed by both schemes is similar to that of the Grameen Bank with some adaptations to the context of urban Ethiopia. To get credit from either scheme any woman above the age of 18 must form a group of five to seven like-minded individuals such as neighbours, childhood friends or close acquaintances. By adopting the group based credit system or by incorporating joint liability and monitoring, it is believed that the problems of screening, incentives and enforcement could be reduced (Khandker et al., 1995a: 17 and Johnson and Rogaly: 39-40). This is because the group members know each other very well and screen out the creditworthy borrower from the unworthy one. This system reduces the high screening or transaction cost to the lender and minimizes the problem that would arise due to information asymmetry. However, the group based credit system may have its own drawbacks particularly if a poor person is in need of credit and yet can not form a group because of lack of partners as he/she might be the poorest among his/her neighbours and is considered by them as unworthy borrower.

Applicants who form a group take training on the rules and regulations of either schemes or take business training and are formally registered and issued with their passbooks after passing a group-examination. A member of the group can apply for the first round loan after saving regularly a minimum of Birr 6 for three months under PCS or Birr 16 for two months under

GMFSC. Currently, the maximum loan amount advanced to a single WFC borrower in the first rounds of loan is Birr 600. The small groups are federated into centres or unions of up to five to seven groups. These groups meet bi-weekly to collect savings and repayments, to discuss issues relating to the loan and to disburse the loan to the members on a 2-2-1-model basis for a group with five members. That is, only two members get loans at a time and must repay regularly for at least two months before any further disbursement is made for the next two members of the group. Finally the chairperson is provided with loan after disbursement is made for the four members of the group. A group with members above five also follows the same procedure. This is to check the credibility of the group members in the proper use and repayment of their loans. However, such credit delivery model is not applicable for members who have good repayment records in the first rounds of loan and still require more loans for the next rounds of loan. They are free to apply for the second or more rounds of loan without following the above procedure so as to avoid the unnecessary delays associated with it.

The second and third credit cycles have a maximum loan disbursement of Birr 1200 and 1800 respectively for a single beneficiary of the GMFSC. The group is collectively responsible for the repayment of the loan and peer pressure is involved to prevent or at least to minimize the risk of default in each round of loans.

Generally, both credit schemes with the above methods of operation were designed to meet their objective of poverty alleviation. Hence, provision of micro credit is one of the viable options to improve the living and working condition of these women. However, for this micro financing activity to be sustainable, it must have to bring positive impact on living and working condition of its beneficiaries. Moreover, it must have better loan repayment performance as well.

Since there is no study made on impact and loan repayment determinants of the credit provided to WFCs in Addis Ababa, the study is intended to fill this gap. With this background, the study tries to investigate the impact of micro credit for WFCs and its loan repayment performance.

## **1.2 Objectives of the study**

The objectives of the study are:

- 1.To assess the impact of micro finance on living and working condition of women fuel wood carriers in Addis Ababa and to see whether it can reduce the pressure that WFCs exert on forest trees surrounding the city of Addis Ababa.
- 2.To identify or determine the factors that affect loan repayment performance for the credit schemes provided to the WFCs in Addis Ababa.

## **1.3. Significance of the Study**

As discussed above providing micro credit to the poor is a major strategy for poverty alleviation. Women have a dual role in the society i.e., productive and reproductive role. However, the majority of them have no access to resources, land or property. Hence, providing credit to these poor women, who have no access to formal banking credit or to formal employment would lead to their economic empowerment and poverty reduction. Moreover, the rate at which they deplete natural resources, which is their last resort for survival would be reduced to some extent if credit were given to them to alleviate poverty.

This study is an improvement over the others in that it tries to consider the impact of micro finance on women beneficiaries that are WFCs and its impact (through its poverty alleviation

mechanism) in reducing the deforestation pressure created by these women. Therefore, the study will make some contribution for concerned policy makers and interested researchers in the area. It also helps the governments and micro finance institutions to design effective micro-credit schemes, which make women its sole target beneficiaries.

#### **1.4 Limitations of the study**

This study considers only borrowers viability as it is restricted to impact assessment and identification of determinants of loan repayment performance. Thus, the major limitation of the study is that it will not consider other components of sustainability such as financial, economic, and institutional. Moreover, due to shortage of time and resources it did not make comparison between different credit schemes that make women as its sole target and some other credit schemes in the county.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1. Theoretical Literature

##### 2.1.1. A General Review of Micro Finance and Its Operation

Johnson and Rogaly (1997: 1) defined micro finance as the provision of financial services to the poor that involve small deposits and loans. In the past few decades, with the weakening of governments and donors subsidized credit scheme, micro credit has been considered as an effective means of poverty alleviation.

In the late 1970s, efforts based on the idea of collateral free formal finance, notably that of the Grameen Bank in Bangladesh, pioneered by Professor Muhammed Yunus, came out as an alternative for credit provision with the objective of poverty alleviation (Khandker et al., 1995b: 3). The Grameen Bank is an autonomous, semi-government, special type of financial institution and was termed as "poverty- focused development bank" by Berger (1989: 1021) while Karim and Osada (1998: 264) called it " poverty focused women's development bank". This innovation enabled the poor, who were excluded from the formal financial sector services, to get access to micro credit services by forming their own small solidarity groups. Bakhoun et al. (1989: iii) also stated that in development policy though it is essential to have high level planning, collaboration and coordination from top to the bottom (trickle down approach), it is the bottom up approach that determines whether development will genuinely improve the lives of the poor and the hungry. Emphasizing the trickle up approach (i.e. micro credit approach), Karim and Osada (1998: 257) stated that the poor can be trustworthy and when they are provided with loan

they can use it successfully to expand micro enterprises and to generate income through self-employment.

In addition to its potential in reducing poverty, micro finance plays a role of financial intermediation. That is, it channels surplus resources to the deficit units, who need money to finance or invest in their micro enterprises. Furthermore, it was argued that:

In most developing countries, the formal financial sector does not capture the savings of low-income groups, nor does it provide poor people with loans for investment. Because low-income people represent a large share of the total population in most developing countries, large amount of savings go uncaptured and numerous investment opportunities go unrealised. It follows that efficiency gains can be realized to the extent that these under served groups are brought into the system: their savings can be channelled into loan funds for use elsewhere, and local lending facilities can allow them to exploit high-return investment opportunities (Fidler and Webster, 1996: 22).

This implies that micro finance institution play a key role in the financial sector by joining the lender (micro finance institution itself) and borrowers who have been neglected by the formal banking sector. That is, it plays a crucial role in allocating resources efficiently between the deficit and surplus units that would otherwise not meet each other. Hence these institutions have impact not only on the living standards of borrowers but also on the process of financial intermediation.

The provision of financial services to the poor, i.e. the minimalist credit approach does not suffice to improve the welfare of the poor. Along with the provision of credit, micro credit programs usually offer a package of services such as training, saving facilities, housing, family planning, peer supports etc., which are grossly termed as a "credit plus" approach (Berger, 1989: 1017 and Karim and Osada, 1998: 257).

The routine lending decisions based on non-economic considerations coupled with high transaction costs (high time and travel costs) of formal banks make them less attractive long-term

partners for the small borrowers (Zeller and Sharma, 1997: 1733). The functions of screening, monitoring and enforcement of repayment fall on the bank, resulting in increased transaction cost. Micro finance institution on the other hand, with their innovative features such as group-based lending strategy (or through peer monitoring), reduce the costs and risks of making loans to poor and isolated people and makes financial services to be easily available to them. 'Compared to socially and physically distant bank agents, group members can obtain at low cost information regarding the reputation, indebtedness and wealth of loan applicants and about his or her efforts to ensure the repayment of the loan' (Zeller and Sharma, 1997: 1734).

The well-known bank or credit institutions that assists the poor such as Grameen Bank and Bangladesh Rural Advancement Committee (BRAC) work through group based lending, which is a social collateral and the counterpart of physical collateral in the formal sector. The rationale for group-based lending is that group members have incentive to monitor the utilisation of the loan and also put pressure on the borrower to repay the loan. Furthermore, if this pressure fails and the member defaults on the loan, the whole group will repay the loan on behalf of the member. Group based lending and other social mechanisms can help resolve the problems associated with imperfect information and enforcement of lending. By relying on peer pressure to monitor and enforce contracts, group based lending provides an incentive for borrowers, thereby improving loan recovery rates (Rashid and Townsend, 1994 and Wenner, 1995 in Khandker, 1998: 15). Generally, group based lending is advantageous in that economic ties, social cohesion and kinship among the members helped them to screen *ex ante* unworthy borrower from the worthiest one and monitors *ex post* through checking whether the loan is being used productively or spent on successful projects thereby influencing borrower's ability to repay the loan. Moreover, the group reduces default problem by putting pressure on the member to

repay the loan and also serves as an enforcement mechanism as it pressurises the borrower to meet his/her obligation even in the event of default.

Jain (1996: 88) argued that the high loan repayment rate of Garmeen Bank is not only due to group lending or its attributes, but also to staff morale and commitment. He further suggested that emphasis should be given not only to the importance of strategic credit policies but also to conducive credit organisational culture that motivates the behaviour or the performance of program participants in the desired direction. Khandker (1998: 16) on the other hand, noted that group lending matters for loan recoveries but so do the characteristics of the borrowers and organizers as well as agro-climate and local economic condition.

However, group-based lending system has also its own problem. Individuals select those whom they thrust to form a group with: Z will only have Y in her group if she believes that Y can make regular repayments and savings and has much to lose from the social sanction associated with non-repayment of the loan (Johnson and Rogaly, 1997: 12). This shows that, though such lending system is more accessible to the poor than the formal banking system, there still is room for the exclusion of the poorest of the poor.

Reinke (1996: 273-274, 280) attributed the following factors to the failure of the group based lending system in urban centres of South Africa. In pointing out the presence of high geographical mobility, low attachment to specific neighbourhoods, and peer groups consisting of competitors as the factors that frustrate the solidarity of groups in townships, he recommended an individualist credit system for a better loan repayment performance in South Africa. According to his opinion group based lending is more applicable to the rural environment than to the urban society because of low mobility and strong social ties in the former case.

For micro financing activities to be effective in its operation and to be successful in its objective, it should have to be sustainable. Khandker et al. (1995b: 32) defined credit program sustainability as 'the ability of a program to continuously maintain its activities and services in order to meet its objectives'. Sustainability can be divided into four parts: financial, economic, institutional and borrowers viability.

According to Khandker et al. (1995a: 36), Grameen Bank is financially viable if it can at least equalize the cost per unit lent with the price (that is, the interest rate) it can charge its borrowers. It is economically viable if it can meet the economic cost of funds (the opportunity cost) used for credit and other operations with the income it generates from lending. For institutional sustainability the program must have well-institutionalised procedures for ensuring administration and management succession in order that it is not dependent on the leadership of a single person (Khandker et al., 1995a: 36). The success of a credit operation depends on the rate of loan recovery. 'Loan recovery enhances profitability by turning over loanable funds and minimizing default thus improving the viability of the Grameen Bank' (Khandker et al., 1995a: 57).

The achievements of a credit program will be undermined if a large number of the beneficiaries are dropping out from the program. This is because by losing its members, micro finance institution can no longer generate more revenue and meet its target of poverty alleviation.' Dropping out could occur at two points, i.e., before or after rising out of poverty or economic graduation' (Karim and OSADA, 1998: 262). It affects both micro financing institutions and the beneficiaries as well. From the program's side, dropouts not followed by new entrants would lead to a decrease in the number of beneficiaries which in turn decreases the amount of fund

available for loans through reducing the income/profits earned in the form of interest rate and the savings that would have been mobilised from those beneficiaries. This would affect the economic viability of the program. According to Karim and Osada (1998: 276) dropping out when viewed from the members' side would mean losing the chance of overcoming poverty and being deprived of services rendered by the program. For the Grameen Bank members, Khandker and Chowdhury developed criteria and estimated that it takes about five years to move out of poverty and seven years for economic graduation (Khandker and Chowdhury, 1995 as quoted in Karim and Osada, 1998: 275). By using these criteria, they found out that more than 88 per cent of dropout not to move out of the poverty as they dropped out within five years of their memberships and none of them are economically graduated.

The most effective method for assessing the impact or benefits of a micro credit scheme is the measurement of its impact on the poor in terms of employment, income, consumption, assets, net worth, nutrition, contraceptive use, fertility and children's schooling (Khandker, 1998: 16).

### **2.1.2. Women, the Informal Sector and Credit**

More than one third of African population live in abject poverty and are unable to meet their most basic needs (UNECA, 1994: 8). The heavy burden of poverty falls disproportionately on the shoulder of women particularly on female-headed households whose proportion keeps on increasing (UNECA, 1994: 8) With limited access to education, few formal employment opportunities and low level of skills, poor women in developing countries often turn to self-employment as a means of surviving themselves and their families (Berger, 1989: 1017). However, they are constrained by lack of capital, technical and managerial know-how, and by

lack of access to credits, markets, raw materials and services necessary to improve their income and standard of living (Berger, 1989: 1017)

Moreover, the growth of the labour force is not proportional to the growth of the economy. Consequently, the majority of the economically active population in less developed countries finds their source of livelihood in the informal sector. ILO in 1992 estimated that the informal sector employs up to 65% of the economically active population in Africa as a whole (ILO/JASPA, 1992 quoted in Hailu and Hall, 1995: 3). Women in the labour force account for a larger share in this growing informal sector due to their lack of education, access to property and resources. They are highly concentrated in the informal sector both as self-employed micro enterprise operators and as employees. The study by Fidler and Webster (1996: 12-13) shows that the informal sector, which has a larger contribution for employment, particularly by employing the majority of women who cannot get employment in the modern (formal) sector, is suffering from lack of credit, which in turn constrains them from reducing poverty.

The informal sector in the less developed countries has clearly demonstrated how the poor manage to survive on the margins of the modern economy (formal sector) and of what activities absorb the waves of rural migrants in to the cities in the absence of rapid industrial labour growth (Portes et al., 1986: 727). Based on this fact current thinking focuses on micro enterprise development as a major tool for poverty alleviation since graduating informal micro enterprises to small businesses is simpler than generating income through the creation of jobs to the poor (Fidler and Webster, 1996: 8).

Competition in most informal sector markets is stiff due to easy entry and flow of large number of people to this sector. Moreover, lack of specialized skills lead micro entrepreneurs to be

concentrated in similar activities, which do not require special skill (Fidler and Webster, 1996: 10). These situations would in turn hasten market saturation and business failure for informal sector operators.

Micro finance institutions usually prefer women clients to men as their services appear to have more impacts on women than on men, and women are, for the most part, excellent clients in discharging their obligations related with the loan (Fidler and Webster, 1996: 24). Moreover, it was argued that women are better customers than their male counterpart as they are more entrepreneurial (Vigano, 1996: 457). Some impact studies shows that women spends the extra income that flows from investment of their loan funds for the benefits and well being of their families (Fidler and Webster, 1996: 24). That is they don't spend their money on entertainment or extravagant expenditure like their male counterparts.

Berger (1989: 1023) noted that collateral requirement, husband's agreement, lack of time because of household and the market place work, cultural factors, etc. prevent women from accessing formal sector credit. The other alternative source of funds for poor women are the informal sources such as moneylenders, pawn brokers, suppliers etc which are very costly and unreliable. Regarding poor women's access to credit it was argued that,

For the very poor, especially for poor women, access to credit may thus alter the optimal time allocation for home-production of non-market activities such as child-care to home-based market production. Because of credit market imperfections, the poors' access to credit may make a large impact on their welfare. Credit market imperfections may again differ according to gender - women are more likely to be credit constrained than men did (Khandker, 1998: 13).

This implies that women have no opportunity to get information about the availability of credit, as they are busy in household work and are constrained by social, cultural and religious barriers.

Micro credit programs usually offer non-credit input such as consciousness-raising training and other technical support that may empower the poor, especially poor women (Khandker, 1998: 13).

### **2.1.3 Micro Credit and Women's Empowerment**

Since women's roles are diverse, as it ranges from parental, professional, matrimonial, domestic family to community and individual role, they need to be empowered economically as well. However, the term empowerment is difficult to define and there is no clear-cut way to measure it. Economic empowerment, therefore, must be defined by the borrower herself and doesn't necessarily conform to the western urban model (Camilla, 1997: 2). Many scholars on the subject argue that empowerment can be summarized as "participation": increased, or improved participation of women in making various decisions at house hold and community level and the public at large (Camilla, 1997: 4). Empowering for very resource poor women is basically a question of improving or stabilizing their income. In this regard it was argued that,

Poor women's empowerment through access to credit, if at all it happens, will take time and different aspects of empowerment require different time perspectives. Some change will be observable in a few years time: improved business performance, increased incomes and thereby improved living conditions for women and their household members. Others, such as institution building and a significant reduction of overall poverty, will take decades to pass (Camilla, 1997: 6).

Poor women, by taking loan, can contribute to family support. 'Availability of appropriate finance to women can lead to better income distribution among household members which essentially means that women are enabled not only to protect their own well-being but also the wellbeing of their children' (Schrieder and Sharma, 1999: 75). Moreover, by generating income through this loan, they can acquire empowerment and respect from their households. In addition to these, participation in the credit scheme by itself might be described as empowerment or as a manifestation of empowerment. Belonging to a group outside of the family, learning to sign one's name, having a bank account and pass book, taking a loan in one's own name, participating in bi-weekly group or centre meeting, discussion on loan application and other related matters etc., can also be considered as important elements of empowerment. Empowerment will thus emerge from interaction in the credit groups and the linkages it created or reinforces (Camilla, 1997: 6). In relation to this Sinha (1998:3) stated that credit programs empower women by enhancing and increasing their economic roles, their ability to contribute to the family's income, and by helping them establish their identity outside of the family and by providing them experience and self confidence in the public sphere.

The study of rural credit programs and women's empowerment in Bangladesh (Hashemi et al., 1996: 650) stated that minimalist credit programs provide access to important economic resources, and thus enable women to negotiate gender barriers, increase their control over their own lives, and improve their relative position in their households. He found that the majority of the women involved in these programs maintain a significant measure of control over their assets and income. He further recognized the substantial effect that income change has on their empowerment despite its small magnitude in relative terms (Hashemi et al., 1996: 650).

Goetz and Gupta (1996: 46) also argued that increase in women's income improves the unique livelihood enhancement functions that they perform for households as brokers of health, nutritional, and educational status of other household members. It is also argued that credit for women, as a form of economic empowerment, can also increase women's self-confidence and status within the family as independent producers and providers of income to the household. Johnson and Rogaly (1996: 38) also further argued as follows.

Micro finance interventions may lead to empowerment for women by increasing their income and their control over that income, enhancing their knowledge and skills in production and trade, and increasing their participation in household decision making. As a result, social attitudes and perceptions may change and women's status in the household and community may be enhanced.

#### **2.1.4. Poor Women and the Environment**

Poverty has also an environmental dimension. It restricts people's options and motivates them to deplete natural resources faster than is compatible with long-term sustainability. Hence, the poor themselves can be agents of environmental degradation or may aggravate the process of its degradation (Ekbohm, 1999: 7). At the 5th African Regional Conference on women it was indicated that:

Poverty is a major cause and consequence of environmental degradation and is compounded by scarcity, depletion and mismanagement of resources for the initiation, stimulation and promotion of sustainable development for a growing population. Women, specifically experience this impact in terms of their changing roles and the traditional division of labour. Often women have no choice but to exploit natural resources in order to survive, even though they may possess knowledge of environmental protection and sustainability (UNECA, 1994: 14).

Women are the first victims of environmental degradation as it affects their ability to obtain firewood, energy, water, food and other resources for household and economic activities

(UNECA, 1994: 14). Hence, they can play a greater role in environmental conservation and management. But if they have no options to survive, they would be forced to exploit natural resources in their surroundings that are available to them free of charge.

In the same report it was argued that women are key environmental managers with profound knowledge of plants, animals and ecological process with which they are intimately associated. In their study on Tanzania, Rajabu and Chedieli's (1997: 7) found out that women and girls had greater love for the environment and value it better than men. But poverty may induce them to degrade the environment, hiding their potential role in environmental management, conservation and protection. Micro finance can have a direct or indirect influence on the environment (Pallen, 1997 as quoted in Schrieder and Sharma, 1999: 67-91). The study by Schrieder and Sharma (1999: 77) indicated that micro enterprises that have access to micro finance services have used goods and processes that are environmentally "light " and sustainable. Therefore, it is essential to provide micro credit to these poor women so as to encourage them to expand/shift to alternative income generating activities and reduce the poverty trap rather than engaging in environmentally unfriendly activities. Other studies (Salafsky and Wollenberg, 2000: 1422-1437) shows us the presence of a number of conservation strategies ranging from a strategy that limits local people's use of the forest resources to meet their subsistence to linked incentives strategy that promotes the link between biodiversity and livelihood intervention. Providing more rewarding livelihood options to prevent the local people from practicing environmentally damaging livelihood activities could result in the latter strategy. Hence, it is essential to integrate poor women (such as women fuel wood carriers in this study who make their earning by exploiting the forest resources) into forest conservation or environmental management policy in combination with other possible strategies for poverty alleviation so as to reduce their possible negative impact on environment.

## 2.2 Empirical Literature

Impact assessment for any credit program is essential to monitor the success of the program in its major objectives or to see whether the program brings the desired benefits to the target group (beneficiaries). Regarding impact of credit for women Camilla (1997: 1) stressed that

Repayment per se by the borrower can never be the only measure of success. There are countless examples of women borrowing from family members or moneylenders, or even selling off assets, to meet repayment instalment. Only a sustained increase in income from the micro business, as a result of an injection of credit can directly demonstrate successful impact.

In recent years impact assessment has become an increasingly important aspect of development activity as agencies, and particularly aid donors, have sought to ensure that funds are well spent (Hulme, 2000: 79). Conventionally, economic indicators have been widely used in micro finance impact assessments with assessors particularly interested to measure changes in income (despite the enormous problems it presents), expenditure, consumption and assets (Hulme, 2000: 83). Recently, social indicators such as educational status, access to health services, nutritional levels, contraceptive uses and anthropometric measures etc., together with the above economic indicators have been used to assess impact of micro finance on the beneficiaries (Hulme, 2000: 83). Furthermore, Copestake (1995: 421) noted that impact might be measured on income, wealth, food security, and child nutrition and on quality of life or on gender relations.

Studies made in Bangladesh on Grameen Bank loan participants showed the positive impact of the program in increasing household income, expenditure on basic necessities, employment, nutritional intake and other social benefits for women such as the use of more reliable source of drinking water, contraceptives and latrine services as well as avoidance of earlier marriage (Fidler and Webster, 1996: 23). In general, most impact assessment studies show the improvements in quality of life and the positive impact of micro finance in poverty reduction. However, even this famous bank is currently facing an increase in the number of dropouts that

affect its contribution to poverty alleviation and the viability of the program and its borrowers in the future (Karim and Osada, 1998: 276-277).

As regards to repayment rate, Johnson and Rogaly (1997: 88) reported a loan repayment rate of 95%, 100% and 82% in the micro-financing scheme in Mexico, Pakistan and Ecuador respectively. In West Africa too, Fidler and Webster (1996: 38) indicate an average of 89% loan repayment rate for the forty-four programs considered by them.

The study of loan repayment performance is mostly an empirical issue. Based on this there are a number of factors, which affect loan repayment performance. Kulundu (1990: 85) by using Ordinary Least Square method found that loan diversion, use of purchased farm inputs, farm income, sources of income from farming activities and farmers attitude towards loan repayment have statistically significant influence on loan repayment rate for small holder farmers in Kenya. However, factors such as crop performance, off-farm income and general education of the farmer are reported to have statistically insignificant influence. Regarding the sign only three variables (farm income, off-farm income and farm inputs) are reported to have negative relationship with the proportion of arrears (unpaid debt) on loan.

Using a linear regression model for Njombe district in Tanzania Kashuliza (1993: 222) found a positive relationship between loan repayments rate and variables such as educational level, farm income and off-farm income with farm income being significantly affecting loan repayment rate. Age, household size and total expenditure have negative relationship with repayment rate while only total expenditure affects loan repayment rate significantly. In his study in Iringa district of Nigeria (using semi -log regression) he found negative relation for variables age, household size and total off-farm income while educational level, total farm income, total expenditure have

positive relation with loan repayment (Kashuliza, 1993: 223). He also found negative attitude of the borrower towards loan repayment as one of the factors contributing to loan default (Kashuliza, 1993: 224).

Njoku and Odii (1991: 46-48) analysed loan repayment performance of small holders under the Special Emergency Loans Scheme in Nigeria and found the following results. Loan volume, years of schooling, household size and interest paid on loan are positively and significantly related with loan default, indicating that loan repayment decreased with increases in the magnitude of these variables. Regarding the observed positive relation ship between years of formal education and loan default they stated that the very educated beneficiaries are usually absentee farmers who often invest loans in non-agricultural and non productive activities which do not enhance their capacity to repay the loan and led them to default. On the other hand, the coefficient for years of farming experience, loan period, farm size, farming as major occupation, farm output and value of assets have a negative relation with loan default and are highly significant, indicating that loan repayment increases with increase in the magnitude of these variables, and vice versa. Hunte (1996: 54-55) and Vigano (1993: 460-462) found a positive relationship between repeated borrowings or credit experience and loan repayment rate. Others came out with a result which shows that repayment fell with repeated borrowing possibly due to empowerment that came from the latter (Yaquub, 1995 quoted in Mengistu, 1997: 21).

### **2.3 Literature on Ethiopia**

Studies on impact assessment and loan repayment determinants of micro finance institutions are very limited in Ethiopia. With regards to women such studies are almost none existent. In terms of impact assessment, Kassa (1998: 7-9) in his study of the impact of micro financing under the

micro enterprise project scheme in Southern Ethiopia, has shown that before credit scheme 1584 program beneficiaries were able to send 5504 children to school while after the scheme (in the first cycle) 1680 program beneficiaries send 5952 children to the school. In the second credit cycle, the number of children sent to school increases from 406 to 421 out of 460 beneficiaries. He also reported growth in income, employment, consumption and medical expenditure of the beneficiaries after the loan. Using Wilcoxon Matched Pairs Non-Parametric Test, he also indicated that the average income after the loan is greater than the average income before the loan both in the first, second and third loans cycles.

Berhanu (1999: 50-66) in his study of Project Office for the Creation of Small Scale Business Opportunities (POCSSBO) in Addis Ababa arrived at the following results. By using Wilcoxon Matched Pairs Non-Parametric Test, he found that health, education and consumption expenditures have increased after the loan compared to that before the loan. Employment and household income have also increased after the loan. According to his study, access to health services, educational facilities and nutritional status of the beneficiaries have also shown some improvements. But he found unsatisfactory results for saving mobilization, as the project did not attach the saving facility with its credit program or facility.

Camilla (1997: 11) in her study of micro finance for women's empowerment in the case of WFCs argued that poor women are risk averters (don't want to take risk) and only concentrate on low income businesses based on their traditional skills, which is seen as somewhat contrary to the objective of empowerment. She stated that many of business proposal for WFCs are in food processing and retailing. Moreover, she observed the tendency to follow of the crowd where everybody ends up doing the same things and competing with each other for a limited market. However, this copying problem is also common in modern business sector. She also found no

difference in business performance among borrowers who are heads of their household and those who are not.

According to the final report (Alemayehu, 1998: 5) of the WFC/PCS the number of beneficiaries, which were only 220 in 1996 was increased to 539 in 1998. A total of 100 selected members received start- your- business training for 3 days each; with the aim of assisting illiterate group members to assess the market situation of their loan proposal and to make basic feasibility studies with sound business plans (ILO/MoLSA, 1997: 2). The various report of the PCS state the scheme helped beneficiaries to create new jobs, generate more income, enabled them to enjoy saving facilities and to participate in training programs. However, the expansion rate in membership is slow because of the increased dropout rate of the beneficiaries in this scheme (ILO/MoLSA, 1997: 6). The existence of high dropout rates would in turn affect the sustainability of the scheme and have a negative impact on both borrowers and lenders.

As mentioned above empirical studies on determinants of loan repayment performance are very limited in the case of Ethiopia. However, Mengistu (1997) and Berhanu (1999) have come out with studies on determinants of loan repayment performance for two credit schemes provided to their respective beneficiaries.

Mengistu (1997: 56-58) in his study on Ethiopia's two major cities arrived at the negative relationship between loan diversion and record keeping, timely loan granting and monthly household income while household size and number of dependents outside the household has been found to have positive relation with loan diversion in Awasa. Number of dependents outside the household has unexpected negative sign for Bahr Dar. With regard to loan repayment performance, he found that sex, age, and number of workers employed, education and suitability

of weekly repayment period are positively related with loan repayment rate while loan size and loan diversion are negatively related with repayment rate in the case of Awasa. For Bahir Dar expectation for another (future) loan, supervision visit, monthly household income and number of workers employed have positive impact on loan repayment rate whereas loan diversion and loan size (like the case of Awasa) are negatively related to loan repayment rate. Availability of other sources of credit is also negatively related to loan repayment. Other variables such as age and sex are insignificant in affecting repayment behaviour of borrowers.

Berhanu (1999: 67-72) in his study on Project Office for the Creation of Small- Scale Business Opportunities (POCSSBO) in Addis Ababa found that education, timely loan grating and the use of accounting system are negatively related to the proportion of loan funds diverted. On the other hand, loan size, number of dependents within the household, and consumption expenditure of beneficiaries are positively related to loan diversion. He reported that age is positively related to full loan repayment. Loan diversion and loan size are inversely related to full loan repayment performance while income from business financed by the loan and other sources of income have unexpected negative sign with full loan repayment performance. Loan supervision and the use of accounting system are positively related to full loan repayment performance as expected. Perceived cost of default and suitability of the repayment period are positively related to full loan repayment performance.

## **CHAPTER THREE**

### **DATA AND METHODOLOGY**

#### **3.1 Data Type and Source**

The data used in this study are mainly primary and cross-sectional in type. Secondary data is also employed in few of the cases. Loans for which the maturity date has already passed before the time of data collection are utilized for the analysis of loan repayment determinants. Quantitative and qualitative information obtained from the data collected was also used for assessing the impact of micro credit to these same beneficiaries who were women fuel wood carriers before the loan.

#### **3.2 Data Collection**

There are four branches of the WFCs project through which loan disbursements and collections are made. Currently, each branch is considered by GMFSC as a centre or union under Kolfe branch. Each branch/centre has its own credit field officers or facilitators and offices where beneficiaries meet biweekly to repay loan or to discuss on loan application and other related issues. A survey was conducted by employing a structured questionnaire and administered by trained enumerators. The following procedure was used for data collection. First, the target population, that is, all beneficiaries of GMFSC who are/were Women Fuel Wood Carriers were identified and then a sample is randomly taken from this target population through proportional allocation method. The total number of target population as collected from documents of each branch's/centre's credit field officer is about 300 WFCs and the sample size was determined to be 130(i.e.43% of the population) beneficiaries so as to minimize sampling error. After

proportional allocation of the total sample size was made for each branches/centres, individual borrowers were selected randomly from the population of each branch/centre. Each WFC who is beneficiary of either credit scheme is the primary sampling unit. Pre-testing was made on fifteen beneficiaries to make some possible modifications on the design of the questionnaire.

### **3.3 Methodology**

The methodologies employed in this study for assessing impact of the credit schemes to the WFCs and for analysing determinants of loan repayment performances are discussed below. Moreover, econometric software or statistical package such as STATA, SPSS and LIMDEP VERSION 7.0 were used for exploring, summarizing and analysing the data.

#### **3.3.1 Impact Assessment**

Micro finance programs and institutions are becoming increasingly important in development strategies but knowledge about their impacts is partial and contested (Hulme, 2000: 79). Control group method is one of the methodologies for impact assessment. It requires the before and after credit comparison of a population that participate in the credit program and an identical population that did not participate in that program (Hulme, 2000: 85). However, it is a formidable task to assemble control groups that are similar to beneficiaries group. In other words, it is difficult to find a location at which the control group's economic, physical and social environment coincides with that of the beneficiaries group (Hulme, 2000: 84). The control group may have contact with the beneficiaries group, or the loan to these groups may be transferred to the control group and creates a problem for impact analysis based on such groups.

In addition to being costly and time consuming, establishing a perfect control is totally impossible (Adams and Pischke, 1980 quoted in Copestake, 1995: 430)

The other methodology is the consideration of credit as an input to the production function like the conventional labour and capital input to the production function. However, it has a practical difficulty, as credit is a means to the acquisition of inputs rather than being an end in itself.

Because of all these difficulties in assessing impact by using the above two methods, Wilcoxon Matched Pairs Non-Parametric Test for two related samples is employed to assess the impact of a credit scheme on beneficiaries based on the situations of borrowers before and after the loan. 'Impact studies to date are essentially before-and-after studies of participants' (Fidler and Webster, 1996: 23). However, this methodology too does not escape from the limitations faced by others. According to Johnson and Rogaly (1997: 73) some of the limitations one would face, for instance, while assessing impact based on changes in income of the beneficiary's are:

1. Respondents may give false information if loans have been used for a purpose other than the intended one.
2. Establishing a causal relationship to the actual loan in question involves knowledge of all the beneficiaries' sources and uses of funds.
3. It is very difficult to establish what would have happened in the absence of the loan.

Despite its limitation this method has been used by many scholars in the field of micro-finance for assessing the impact of micro credit on the target beneficiaries. In this study too it is employed to assess the impact of micro finance on borrowers who are WFCs by comparing their situation (in terms of living and working condition) before and after their participation in the credit schemes.

Descriptive statistical analysis is employed to assess the impact of either credit schemes on the quality of life, economic and working condition of WFCs before and after their participation in the credit scheme. Moreover, simple statistical tools based on beneficiary's perception are used to see whether these credit schemes has impact on the forest trees surrounding the city of Addis Ababa. Some of the variables used in this analysis are: income, asset, saving, nutrition, educational and health care services, employment creation, frequency of engaging in fuel wood collection, carrying and selling activities and consumption expenditure before and after these women have got access to credit.

### **3.3.2 Determinants of Loan Repayment Performance**

#### **3.3.2.1 Description of the Explanatory Variables**

Loans granted to WFCs, which is considered under this study, is of one-year maturity. Loan repayment performance, which is a dichotomous dependent variable, is determined on the basis of the loan repayment rate (or collection rate). It is the ratio of loan collections on current and past loans for a particular year to loans matured and collectable at the end of that year (Kashuliza, 1993: 219).

Based on previous studies in the area, the following relationships are made between the dependent and explanatory variables considered under this study.

**1. Beneficiary's age:** With increase in age it is usually believed that borrowers acquire stability and business experience (Vigano, 1993: 457, 463). Hence age can affect loan repayment performance positively. However, it can also be negatively related to the loan repayment

performance because as people get old their ability to generate income would declines. Hence, the sign is apriori ambiguous.

**2. Educational level of beneficiary:** This variable can also be positively or negatively related to the dependent variable i.e. loan repayment performance. A borrower with higher educational level has more to lose in terms of a blemished reputation and therefore is more inclined to effect his repayment (Adeyemo, 1984: 272). Moreover, they have better ability to make good use of loan than the uneducated one. However, Njoku and Odii (1991:46) found a negative relationship between educational level of the borrower and loan repayment performance.

**3. Frequency of loan:** In this study frequency of loan is meant simply the number of times a borrower has received a loan. The more the borrowers took and used the loan sensibly and pay it back properly, the more they learn how to handle the loans or how to deal and manage financial resources. One study (Vigano, 1993: 462), for instance, indicates that younger firms are more susceptible to default risk particularly due to lack of historical information on their performance in general or due to lack of experience in business or loan administration in particular. Hence, if the borrowers took a loan more than once, then he/she is a repeat borrower and his/her repayment performance would also be improved as he/she has got experience in business, entrepreneurship and loan administration. In general, this variable is expected to have a positive sign with loan repayment performance.

**4. Loan size:** This variable can have a mixed impact. Generally, the larger the loan size, the greater the probability of unwilling loan default and the higher is the penalty cost associated with it (Sharma and Zeller, 1997:1738). That is, a larger loan usually increases the burden to the borrower and results in non-repayment of the loan. This is because in the event of project

failure, the borrower or the group will find it more difficult to meet repayment obligations out of their personal funds. However, if the borrowing enterprise is efficient enough in raising its productivity and in utilizing more loans, then we may have positive relationship between loan size and its repayment rate (Mengistu, 1999: 123).

**5. Suitability of the bi-weekly loan repayment period:** It is a dummy variable taking the value of one if the bi-weekly repayment period is suitable and zero if not suitable. If the bi-weekly repayment period practiced by WFCs is suitable to the borrower, then there is high expectation for full loan repayment performance. The expected sign between the two variables is positive.

**6. Loan supervision:** It is a dummy variable that equals one if a borrower responds that supervision is the major cause for loan repayment and zero otherwise. If there is continuous follow up and supervision visit to evaluate the loan utilization and repayment of the borrower, then the loan repayment performance could be improved. Hence, it is supposed to have a positive impact on borrower's loan repayment performance.

**7. Availability of income sources other than income from business financed by the loan:** This variable is also a dummy variable that equals one if it is available and zero if not available. If borrowers have different sources of income other than income derived from businesses financed by the loan, then he or she has the potential capacity to repay the loan. Even in the case of failure in businesses financed by the loan, the availability of these income sources enables one to meet his/her contractual obligation. So the expected sign of this variable with loan repayment performance would be positive.

**8. Income from business financed by the loan:** If the beneficiary's income from business financed by the loan has increased, then the capacity of the borrower to repay the loan would also increase. According to Kashuliza (1993: 222) farmers who obtain higher incomes from farming are more likely to repay larger part of their loans than otherwise. So the coefficient of this variable is expected to be positive. But when beneficiaries become successful in their business their incentive to repay a loan would be reduced since they feel as if they no longer demand credit from the same sources.

**9. Beneficiary's attitude towards loan repayment:** It is a dummy variable taking the value of one if a beneficiary perceives that loan is something that should be repaid and zero otherwise. It basically refers to the willingness of an individual to settle his/her obligation (Berhanu, 1999: 35). That is the borrower may be unwilling to pay though he has the capacity to do so. As Kashuliza (1993: 224) mentioned, some borrowers consider the loan as government grants or soft loans or hope that arrears (overdue debt) would eventually be cancelled as bad debts and may not be eager to repay their loan in full, thereby negatively affecting loan repayment performance. If, on the other hand, the borrower has a perception that loan should be something to be repaid, then he/she would most likely settle his/her obligation as per contractual agreement. Hence, the sign between the two variables should be positive.

**10. Beneficiary's perceived cost of default:** This variable too is a dummy variable that equals one if a beneficiary perceives the cost of default as high and zero otherwise. The cost of default is meant to include loss of access to future credit, the social stigma associated with default and the collateral to be forfeited (Jaffe and Stilgiz, 1990: 862). If beneficiaries perceive the cost of default to be high, he or she would repay the loan for fear that he/she might lose his/her property, social status and future access to credit and pressurized by their respective guarantors

or peer groups. A promise to pay in the future (debt contract) is enforced only if the borrower faces costs of default that exceeds the benefits of default (Jaffe and Stiglitz, 1990: 864). Therefore, the expected relationship between this variable and loan repayment performance is positive.

**11. Loan diversion rate:** It is defined here as a ratio of loan amount spent on non-intended activities to total loan proceeds advanced to the borrower (Mengistu, 1997:31). Its effect on loan repayment performance may be negative or positive depending on whether the diverted fund is used for productive (not for consumption) purposes (which could generate income for the borrower and increase his/her repayment capacity) or not. It makes sense to divert the loan when market conditions of the product for which one has received a loan declines or if the input price of that intended business becomes excessively high. In this case expecting positive sign between loan diversion and loan repayment performance is logically acceptable.

On the other hand, loan diversion rate is in turn affected by some other variables within and outside the model for determining the factors that affect loan repayment performance. Hence, it requires a recursive type of model to address the issue of interdependence between this independent variable and the error term. The following variables are supposed to affect loan diversion rate.

**1. Number of dependents:** As the number of dependent of households becomes large, the expenditure for consumption and other basic household requirements will increase and force the borrower to divert the loan proceeds to cover such non-productive expenditure (Njoku and Odii, 1991:47). Hence, this variable is expected to have positive sign with loan diversion rate.

**2. Income from business financed by the loan:** This variable is expected to have a negative sign with loan diversion rate. With increase in income the borrowers tendency to divert the loan to other non-intended purposes will decline as this incremental income can cover expenditure needed for other non-intended purposes.

**3. Availability of income from sources other than the project financed by the loan:** It is a dummy variable that assumes the value of one if it is available and zero if it is not available. A borrower with diversified sources of income has the potential to cover any unforeseen expenditure that pressurizes him/her to divert the loan. Kulundu (1992: 88-89) states in his study that many sources may provide continuous flow of income to farmers (borrowers) enabling them to meet most of their day-to-day expenses without resorting to using loan funds. Hence the coefficient of this variable is supposed to be a negative sign.

**4. Educational level of the beneficiary:** Educated people can understand more about the probable effect of diverting a loan to non-productive activities and try to reduce such behaviour (negative sign for this variable). However, this variable can also be positively related with loan diversion rate. In relation to this Berhanu (1999: 40) stated that educated beneficiaries would also divert loan proceeds in search of a more profitable line of activity as the aspiration level of the more educated seems to be relatively higher than the one with less or no educational level.

**5. The use of accounting system:** It is a dummy variable that takes a value of one if a beneficiary uses accounting system and zero if not. Use of book keeping and recording methods by the beneficiaries for any daily business operations or transactions would reduce borrower's confusion in separating loan proceeds from other income. This in turn facilitates the use of loan

proceeds to intended purpose only. Hence the variable will have a negative sign in relation to loan diversion rate.

**6. Suitability of bi-weekly instalment period:** It is a dummy variable that equals one if the bi-weekly repayment period is suitable and zero if not suitable. If the instalment repayment period is too short for the borrower to generate income from the loan proceeds then he/she is forced to use the loan proceeds for repaying his/her debt rather than using it for generating income. Borrowers who regard the instalment (repayment) period as suitable divert lesser amount of loan proceeds than those who regard the period as unsuitable would do. Hence the expected sign of this variable with loan diversion rate is negative.

**7. Loan supervision:** This variable too is a dummy variable taking the value of one if a borrower responds that supervision is the major cause for loan repayment and zero otherwise. If there were strict supervision and follow up then the probability of diverting a loan for non-intended purposes would be lower (negative sign in this variable).

**8. Loan Size:** Generally, larger loan size relative to the required amount is expected to have a positive sign because the borrower diverts loan sizes in excess or beyond the intended purpose of the loan. If the loan amount were however, enough only to cover the cost of the intended purposes, then the room for diverting a loan for consumption purposes would be narrower.

**9. Household consumption expenditure:** Borrowers usually divert their loan for consumption purposes. This variable is expected to be positively related to loan diversion rate.

### 3.3.2.2. An Overview to the Formulation of the Model

The endogeneity of the loan diversion variable forces us to use a recursive type of model for analysing loan repayment determinants. Kulundu (1990: 85-89), in order to find the relative importance of the factors affecting loan repayment performance, first used this methodology for smallholder farmers in Kenya. Therefore, we have two sets of equations. The first one is the loan repayment performance equation, which enables us to determine factors affecting loan repayment performance. The second is the model for determining factors affecting loan diversion rate and from which the fitted values are obtained and entered as a variable affecting loan repayment performance in the first equation.

To arrive at the best estimate, it is essential to employ the appropriate model for conducting estimation process. As the dependent variable, loan repayment performance, is dichotomous variable which takes the value of '1' if loan is fully repaid (if the borrower is not a defaulter) and '0' if the borrower is a defaulter, then the following models that are commonly used for estimating dichotomous response variables can be used for estimation purpose. These models are

1. The linear probability model
2. The logit model
3. The probit model
4. The Tobit (censored) regression model

The linear probability model has, however, the following four major shortcomings (Gujarati, 1995: 541 and Greene, 1993: 873-874). For the sake of illustration consider the following simple model.

$$y = \beta'x + \varepsilon \dots\dots\dots (1)$$

Where  $x$ =a vector of explanatory variables

$\beta$ = a set of parameters

$y$  = a dichotomous dependent variable which takes the value 1 if the event occurs and 0 otherwise

$\varepsilon$ = The error term

The first major problem associated with linear probability model (LPM) is that the error term is not normally distributed. Since '  $y$  ' can only take on two values, 0 and 1 for a given  $x$ , then  $\varepsilon$  equals  $-\beta'x$  or  $1-\beta'x$ , with probabilities  $1-F$ , and  $F$ . This indicates that  $\varepsilon$  follows the binomial distribution rather than normal distribution. The second problem with LPM is the heteroscedastic nature of the error-term. By definition,

$$\text{Var} [\varepsilon]=E [\varepsilon-E (\varepsilon)]^2 \dots\dots\dots(2)$$

$$=E (\varepsilon)^2 \dots\dots\dots (3)$$

Then its variance is  $\text{var} (\varepsilon)=\beta'(1-\beta'x)$  which is heteroscedastic because it depends on conditional expectation of  $y$ , which of course depends on the values taken by  $x$ . Hence,  $\varepsilon$  depends on  $x$  and is not homoscedastic.

The third major problem is that the conditional probabilities ( $\beta'$ ) may lie outside the (0,1) range. We cannot constrain  $\beta'x$  to the zero-one interval and hence nonsense probability and negative variances could occur (Greene, 1993: 874).

The last major problem is that the LPM forces the probability changes to be a linear function of  $x$ , which is meant the marginal or incremental effect of  $x$  remains constant throughout. That is the derivative with respect to a given explanatory variables is constant for the linear probability model while it is calculated at different levels of explanatory variables for the logit and probit model so as to know the range of variation for the resulting changes in the probabilities (Gujarati, 1995: 552-569). In the logit and probit models all the explanatory variables are involved in computing the changes in probability whereas in the LPM only the  $j^{\text{th}}$  explanatory variable is involved (Gujarati, 1995: 569). In general the fourth problem is a fundamental limitation of the LPM, as it cannot be overcome by some necessary manipulation done for the pervious three problems. Since it has all these shortcomings and inefficiencies, LPM is not selected for this study.

In reality one would expect that the probability of the occurrence of event to be non-linearly related with  $X$ , the explanatory variables, and never step outside the (0,1) range. This would provide us with a cumulative distribution function (CDF) from which the two commonly chosen CDF-the logistic and the normal CDF emerge which in turn give rise to the logit and probit models respectively (Gujarati, 1995: 563). These two models do not suffer from the fundamental problem that LPM faces. Since both models guarantee that the estimated probabilities lie in the (0,1) range and are non-linearly related to the explanatory variable, employing either model for estimating dichotomous response variable is by far better than the conventional regression model such as OLS.

Basically, the logistic distribution is similar to the normal except in the tails, which are heavier. There are practical reasons for choosing one or the other in some cases for mathematical

convenience but it is difficult to reason out the choice of one distribution or another on mere theoretical grounds (Greene, 1993: 875).

In the loan repayment equation, the loan diversion rate variable has been identified to be endogenous because of its dependence on variable both with in and out side the model. To account for the relationship between this variable and the error term, the fitted value of LDR has been considered so as to enter as one of the regressors in the probit model, which is going to be used for estimating loan repayment determinants.

Loan diversion rate (LDR) being a ratio of total loan diverted to non-intended purposes to the total loan advanced to the borrower, can take a value zero (for no diversion) greater than zero but less than one (for partial diversion) and one (if fully diverted). That is, the values of loan diversion are limited between 0 and 1. The dependent variable is truncated at both zero and one. Moreover, there are a large number of zeros. Hence, the appropriate model to compute the predicted (fitted) value of loan diversion rate is the two-limit Tobit model (Maddala, 1983: 161), which is specified as follows.

$$LDR_i^* = \beta' x_i + U_i$$

Where  $LDR_i^*$  is the latent variable,  $\beta'$  is a set of parameters,  $x_i$  representing a set of explanatory variable and  $U_i$  stands for the error terms. If we denote the observed dependent variable by LDR,

$$\begin{aligned} LDR_i &= 0 \text{ if } LDR_i^* \leq 0 \\ &= LDR_i^* \text{ if } 0 < LDR_i^* < 1 \\ &= 1 \text{ if } LDR_i^* \geq 1 \end{aligned}$$

Here 0 and 1 are the lower and upper limits, respectively.

The other model used in this study is the probit model. The probit model is based on the normal distribution and is one of the models, which enable us to deal with dichotomous dependent variables. Since loan repayment performance, the dependent variable in this study, is dichotomous the probit model is used for its analysis. Estimation of the Tobit model should precede that of the probit model so as to get the fitted values of loan diversion rate, which is one of the explanatory variables in the probit model (the model for estimating loan repayment determinants).

In this study the probit model, for estimating determinants of loan repayment performance, is modelled by assuming that there is an underlying response variable,  $I_i$ , an unobservable utility index and is defined by the regression relationship,

$$I_i = \beta' x_i + \epsilon_i$$

Where ' $x_i$ ' represents explanatory variables,  $\beta'$  is a  $k \times 1$  vector of parameters in the model and in practice  $I_i$  is unobservable (Gujarati, 1995: 563-565). The rationale for analysing loan repayment performance on the basis of non-observable utility index is that borrowers repay their loan if they get benefits or utilities from repaying the loan. For instance, by repaying his first round small amount of loan, he can be entitled to higher loan amount in the second round loan. The model is based on normal distribution and it is assumed that the error term  $\epsilon \sim N(0, \sigma^2)$ .

As  $I_i$  is unobservable, what we usually observe is a dummy variable  $LR_i$  defined by

$$LR_i = 1 \text{ if } I_i > 0$$

$$LR_i = 0 \text{ otherwise}$$

Here '0' being a critical or threshold level of index ( $I^*$ ).

From the above two relations we can compute probability that  $LR_i = 1$  or  $I > 0$

$$\begin{aligned} \text{Prob}(LR_i = 1) &= \text{Prob}(\beta' x_i + \epsilon > 0) \\ &= \text{Prob}(\epsilon > -\beta' x_i) \end{aligned}$$

If the distribution is symmetric as are the normal and logistic, we have

$$\begin{aligned} \text{Prob}(I_i > 0) &= \text{Prob}(\epsilon < \beta' x_i) \\ \text{or Prob}(LR_i = 1) &= \text{Prob}(\epsilon < \beta' x_i) \\ &= F(\beta' x_i) \end{aligned}$$

Where  $F$  is the cumulative distribution function (CDF). In this case the observed value of  $LR_i$  are just realization of a binomial process in which probabilities are given by  $F(I)$  or  $F(\beta' x_i)$  (Maddala, 1983: 22).

Since estimation of binary choice model is based on the method of maximum likelihood, each observation is treated as a single draw from a Bernoulli distribution (binomial with one draw) resulting from the model with success probability  $F(\beta' x)$  and independent observation which

leads to the following joint probability or likelihood function (Greene, 1993:882; Maddala, 1983: 22),

$$L = \prod_{LR_i=0} [1 - F(\beta' x_i)] \prod_{LR_i=1} F(\beta' x_i)$$

The first product is over observation for which  $LR_i=0$  and the second product is over observation for which  $LR_i=1$ . To relate this non-observable utility index with the decision of repaying loan in full first borrowers have been grouped in to two categories based on the rate of repayments they achieved. Accordingly, we have category of borrower with repayment rates of 90% and above and those with repayment rates of 89% and below. This grouping is based on the 10% of loan amount that a borrower is required to deposit in a saving account with the aim of developing a credit guarantee system and to encourage beneficiaries to develop saving behaviour. This is intended to make it clear to borrowers that not only credit but also saving is important for poverty reduction as it raises the financial base of the beneficiary.

The major reason for this grouping is to separate borrowers with repayment problem from those who have good repayment performance. Based on this fact borrowers with repayment rate of 90% and above are considered as borrowers with no repayment problem while those with repayment rate 89% and below are considered to be defaulters (with repayment problem).

Bringing the above two (simultaneous) equations together we have,

$$LDR_i^* = \beta' x_i + U_i$$

$$I_i = \beta' x_i + \epsilon_i$$

Hence, to proceed with estimation we impose the restriction that the error terms are not correlated with one another. It also helps us to ensure the non-existence of simultaneous equation bias and to avoid the problem of non-identification. That is,  $\text{Corr}(\epsilon_i, U_i) = 0$ .

## CHAPTER FOUR

### EMPIRICAL ANALYSIS

#### 4.1 Descriptive Analysis

The survey result shows that about 55% of the sampled beneficiaries took loans in both the first and the second credit cycle while only 20% took the third round loan. Since most micro finance institutions provide loan to beneficiaries not for consumption but for income generating purposes the result from this survey indicates that about 52% of the beneficiaries took the loan to engage in activities of baking and selling injera and ambasha. Even though they took loans for diverse activities, a great number of them concentrated in the same businesses or activities. Hence, a single borrower can engage in two or more activities at the same time.

Table 4.1-1 Distribution of respondents by intended purpose of loan.

purpose for which the loan was taken	Frequency	Percent
Baking and selling injera and ambasha	52	40
Preparing and selling food items	11	8.5
Cereal or pulse trading	15	11.5
Weaving or spinning	4	3.1
To trade in clothes or second-hand clothes	17	13.1
Preparing and selling local drinks	16	12.3
To renew or build a house for rent	21	16.2
Petty trading or retailing	17	13.1
Mini restaurant or tea room	6	4.6
Small kiosk	9	6.9
Others	20	15.4

Some of the beneficiaries, who have taken loans for their respective intended purposes mentioned in Table 4.1-1, may not dispose the whole amount of loan to that purpose only. The study indicates that 24 borrowers have diverted the loan to other purposes and they account for

about 18.5% of the sampled borrowers. While four of them diverted the loan in full (total loan diversion) the other diverted it partially. Table 4.1-2 shows the reasons for loan diversion.

Table 4.1-2 Distribution of respondents by loan diversion factor.

Reason for loan diversion	Frequency	Percent
Illness	6	25
Non-profitability of the business	4	16.67
Loan amount in excess of the intended purpose	2	8.33
Household problem	6	25
Destruction of home	3	12.5
Insufficiency of loan size	3	12.5
Total	24	100

With regard to the suitability of loan repayment period, 81(62.3%) of the sampled beneficiaries considered the biweekly repayment period as unsuitable where as 49(37.7%) of respondents considered it as suitable. Most of them regarded this repayment period as unsuitable because it did not match with the income that could be generated from their businesses financed by the loan. They stated that fifteen days is too short for their activity to generate profit. They claimed that they are forced to repay the loan proceeds they have taken without making any business progress or even without starting their intended activity.

A number of sampled beneficiaries stated that they repay their debt from the loan proceeds they have received as profits or income cannot be generated within this short period. Almost all beneficiaries who considered the repayment period as unsuitable suggested a monthly repayment period as a suitable repayment schedule to resolve this problem. Only one woman recommended a repayment period of one week. Her reason for preferring weekly repayment period is that as the repayment period becomes shorter, the burden of repaying the loan would be simpler thereby making loan repayments easier for the borrower as compared to the relatively larger amount required to effect repayment in a biweekly repayment period.

Table 4.1-3 Distribution of perceived cost of default as ranked by respondents

Ranks to perceived cost of default	Perceived cost of default.			
	Claims on personal wealth	Claims against guarantee	Social sanction	Loss of future access to credit
1	29	40	41	21
2	28	42	27	32
3	45	32	25	28
4	28	16	37	49

With regards to the beneficiaries' attitude towards loan repayment, the survey result indicated that all the sampled beneficiaries (100%) have the attitude that loan is something that should be repaid. Similarly, all 130 (100%) of respondents considered the cost of defaults as high. Hence, these two variables seem to have a certain contribution for the positive loan repayment performance of either scheme. All of the beneficiaries also responded positively on questions regarding peer groups in that they know each other and feel responsible for each group member. Regarding the perceived costs of default, 41 respondents ranked social sanction first while 40 respondents ranked claims against guarantee as the first. Moreover, 42 respondents ranked the latter as the second factor that motivated them to repay their loan. Hence, group pressure or group guarantee system and social sanction, both of which serve as social collateral for the lending agencies, are also important factors that affect loan repayment behaviour of the borrower. With regards to supervision, the survey result showed that 107 (82.3%) respondents considered it as the main factor for loan repayment performance while 23(17.7 %) considered it as inadequate and not as a main factor for loan repayment performance.

## 4.2 Assessment of the Impact of Micro finance on Women Fuel Wood Carriers

### 4.2.1. Assessing the Impact of Micro finance on the Working Condition of WFCs and its Relation to Deforestation.

The survey result indicated that about 119 (92.2%) beneficiaries ranked fuel wood collecting, carrying and selling as their first major (sole) activity and 11(7.8%) of them ranked it as their second major activity before the loan. However, after the loan the number of women that engaged in this activity declined greatly.

Table 4.2.1-1: Distribution of respondents by major activities before the loan in their order of importance.

Type of activities before the loan	Number of respondents by the rank they attach to each activities before the loan							
	1		2		3		4	
	Freq.	%	Freq	%	Freq	%	Freq	%
Fuel wood carrying and selling	119	92.2	11	7.8	-	-	-	-
Selling bread injera, and ambasha	4	8.7	34	73.9	7	15.2	1	2.2
Petty trading	-	-	9	45	9	45	2	10
Hand crafts	-	-	5	41.7	5	41.7	2	16.7
Preparing and selling local drinks	1	6.3	8	50	4	25	3	18.8
Weaving and spinning	4	26.7	7	46.7	2	13.3	2	13.3
Employee of the WFC project	1	50.0	1	50	-	-	-	-
Daily labourers	2	40.0	2	40	-	20	-	-
Others	2	15.4	6	46.2	3	23.1	2	15.4

Table 4.2.1-1 and Table 4.2.1-2, respectively, indicate the major activities of respondents before and after taking the loan. Table 4.2.1-2 mainly indicates the shift of the sampled WFCs to other alternative income generating purposes other than fuel wood collecting and carrying.

Before the loan there were 119 WFCs who considered fuel wood carrying and selling as their major activity (see Table 4.2.1-1). But after the loan only two of the respondents ranked it as their major activities. The other point to be addressed is the frequency of engaging in the activity of collecting, carrying and selling fuel wood before and after the loan by WFCs.

Table 4.2.1-2 Distribution of respondents by major activities after the loan.

Type of activities after the loan	Number of respondents by the rank they attach to each activities after the loan							
	1		2		3		4	
	Freq	%	Freq	%	Freq	%	Freq.	%
Preparing and selling bread/injera/ambasha	48	72.7	16	24.2	2	3.0	-	-
Weaving/ Spinning	7	29.2	8	33.3	6	25.0	3	12.5
Employee of the WFC project	3	30.0	6	60.0	1	10.0	-	-
Mini restaurant or tea room	2	66.7	-	-	1	33.3	-	-
Collecting and selling fuel wood	2	20.0	5	50.0	1	10.0	2	20
Small kiosk	11	61.1	7	38.9	-	-	-	-
Preparing and Selling local drinks	8	47.1	7	41.2	2	11.8	-	-
Petty trading	7	58.3	2	16.7	2	16.7	1	8.3
Cereal/pulse trading	3	100.0	-	-	-	-	-	-
Preparing food items	3	42.9	3	42.9	1	14.3	-	-
To trade in cloths and second hand clothes	13	81.3	2	12.5	3	6.3	-	-
Renting a house	5	38.5	5	38.5	1	23.1	-	-
Other	21	67.7	6	19.4	1	3.2	2	6.5

Table 4.2.1-3 Distribution of respondents by their frequency of collecting, carrying and selling fuel wood before and after the loan.

Periods	Before the loan		After the loan	
	Frequency	Percent	Frequency	Percent
Daily	65	50.0	8	6.2
Two or three days in a week	58	44.6	-	-
Weekly	5	3.8	6	4.6
Monthly	-	-	1	0.8
Yearly	-	-	1	0.8
Complete abandonment	-	-	103	79.2
Others	2	1.5	11	8.5

Before the loan 94% of the sampled beneficiaries (i.e., 50% of them daily and 44.6% of them two or three days in a week) engaged in collecting, carrying and selling fuel wood daily or two or three days in a week. Table 4.2.1-3 indicates that the majority of the respondents, that is, 65 (50%) of them daily and 58 (44.6%) of them two or three days in a week engaged in collecting, carrying and selling fuel wood before the loan. Together they constitute 94% of the sampled WFCs. Because of harsh working condition and the low income earned from it most of the

beneficiaries have completely abandoned the activity of collecting and carrying fuel wood for sale after the loan (see Table 4.2.1-3).

In addition, they wished to leave this activity because it caused health problems such as chest and back pain, deformed spinal column, broken heads and legs. Table 4.2.1-4 indicates some of the health problems associated with this activity. Ninety-five respondents (73.1%) reported stress and sever headache, while 54 (41.5%) respondents reported chest and back pain as the health problems that they experienced while collecting and carrying fuel wood for sale before the loan.

In general, the impact of credit provided by WFC/PCS and GMSC on improving and changing the working condition or the working environment of these WFCs cannot be underestimated. The shift to other alternative income generating activities (as indicated in Table 4.2.1-2) and the complete abandonment of fuel wood carrying and selling by most of the beneficiaries after the loan (see Table 4.2.1-3) shows us the positive impact of micro finance to these women.

Table 4.2.1-4: Distribution of respondents by their health problems

Health problem	Frequency	Percent
Chest back pain	54	41.5
Deformed spinal column	20	15.4
Broken heads and legs	44	33.8
Stress and sever head ache	95	73.1
Eye sight deficiency	17	13.1
Heart Problem	17	13.1
Other	11	8.5

Hence, if most of WFCs is provided with credit to engage in alternative income generating activities then they would abandon the activities of collecting, carrying and selling fuel wood daily or frequently from the forest trees surrounding the city of Addis Ababa.

The provision of micro credit to these women would in turn reduce the pressure that they could exert on forest stock of the city. The leaves, barks, twigs and branches of the trees, which nourish the soil and thereby contribute to the continued growth of trees, are extensively collected by these women leading to the degradation of the soil and trees. Moreover, they not only collect leaves, branches and twigs, but also cut the trees improperly leading to the disruption of its rotation cycle. They do this not because of ignorance of the importance of the forest trees but because they lack alternative means of survival. A majority of them aware of the importance of these forest stocks and its declining trend. One hundred twenty-eight respondents (98.5% of the total) stated that the stock of these trees is continuously declining. Even though they believe that their share is minimal, a majority of them agree (98.5% of the sampled beneficiaries) that they contribute to the degradation of the forest trees surrounding the city. Therefore, finding an alternative income generating activities for these women can to a certain extent reduce the pressure exerted on the forest stocks of the city.

From the total of 130 sampled beneficiaries, 125(96.2%) have knowledge about the direct uses of tree such as its use for construction, building, firewood a part form being a means of their livelihood. Moreover, 106(81.5%) of them also know the indirect use values of the forest such as protection of soil erosion, serving as a habitat for wild life, for recreational services, for parking, for attracting rainfall etc. Since provision of credit to all of WFCs in the city is difficult, one possibility of solving deforestation problem caused by these women is through integrating them into forest management policy, as they are conscious about the use values of forest resources. They knew its importance and showed interests in protecting it. From 130 sampled respondents 126 (96 %) agreed to participate into any integrated forest management efforts made by the concerned organ. This latter option could be effective because as the WFCs

who get credit stops carrying fuel wood to the urban market, then the demand for fuel wood may rise and results in high price of fuel wood thereby attracting many poor women to engage in these activities. Therefore, provision of credit to these targeted beneficiaries only may not suffice as other new carriers could replace their vacant place. The opinion of the WFCs during the survey also confirmed this idea. That is about 111(85.4%) of them agreed with the idea that the shift of WFCs who get credit to other alternative income generating activities would result in an immediate replacement by other new carriers.

#### **4.2.2 Assessing the Impact of Micro finance on Empowerment, Living and Economic condition of women Fuel Wood Carriers.**

Participation of the WFCs in the institution which provides credit for them, their involvement in group formation, their participation and discussion on group or centre meetings, having one's own name registered on their respective passbooks, provision of training as a priority for taking loan etc., are some aspects of empowerment for these needy and marginalized women.

Participation in training and skill up grading is one element of women's empowerment. Since majority of them have no access to formal education, training and technical support for these women contribute a lot to their empowerment.

Table 4.2.2-1: Number of respondents by types of training provided

Types of training	Number of respondents	Percent
Business or technical training	67	51.5
Market training	52	40.0
Administrative skill training	20	15.4
Credit and Saving training	126	92.8
Book keeping and Recording training	42	32.3

As indicated in Table 4.2.2.1 almost all of the women fuel wood carriers, i.e., 126 of them have participated in the basic training program (i.e. credit and saving training) that contributes to their empowerment. Increase in income from business financed by the loan could also empower women enabling them to negotiate on gender power or decision-making and improve their relative position in the household. With the income they get, these poor women are able to contribute or even become sole source of household expenditure as a result of these schemes. For instance, Table 4.2.2-2 and the survey results in general showed us the contribution of women to family's support, which is one aspect of empowerment. From Table 4.2.2-2 one can observe the increase in the share of women borrowers who cover household's expenditure for medical services. It was only 31 (23.8%) women fuel wood carriers that can cover households' medical expenditure before the loan. This share has increased to 40(30.8%) after the loan. The increase in the number of respondents who answered by saying "myself and other family members" from 36 (27.7) beneficiaries (before the loan) to 40(30.8) after the loan also indicates the increase in the relative contribution of women to household's medical expenditure. However, some of the increase may be attributed to the increased incidence of illness after the loan or due to increase in income from sources other than business financed by the loan or due to fall in the contribution of other family members.

Similarly, the contribution of women borrowers in households' consumption expenditure increases in the same fashion. The survey result indicated that the number of respondents who are able to cover consumption expenditure increased from 30 (23.1) beneficiaries before the loan to 37 (28.5%) beneficiaries after the loan.

The other variable to be considered is saving. Women fuel wood carriers had no experience of saving prior to the loan. Saving mobilisation is one of the basic objectives of the WFCs pilot credit scheme and that of Gasha Micro financing Share Company.

Table 4.2.2-2 Distribution of respondents by their share of household's expenditure for health services before and after the loan.

Sources	Before the loan		After the loan	
	Frequency	Percent	Frequency	Percent
Your self	31	23.8	40	30.8
Family members and relatives	29	22.3	21	16.2
Yourself and other family members	36	27.7	40	30.8
Free medical service	23	17.7	14	10.8
Total	119	91.5	116	89

Providing saving facilities for these women is also another important contribution of micro finance .It builds confidence for these women by smoothening their income across time to meet economic uncertainties. It also enables them to re-invest the saved amount and to earn interest on their deposit. Developing saving habits or culture among these women there by creating confidence would also be one elements of empowerment. As prior saving is a requirement to get access to the loan all of the respondents have a saving account after their participation to the loan provided by either credit schemes while only 17 % of them had it before.

The contribution of loan to asset growth is also one of the variable to be considered in this study. As understood from most of the beneficiaries' response, the contribution of loan to asset growth is marginal (see Table 4.2.2-4). From the total sample 43% of the beneficiaries reported that access to credit contributes a little to asset growth, while 30% responded its nil contribution.

Table 4.2.2-3 Distributions of respondents by availability of saving account before and after the loan.

Response on availability of saving account	Before Loan		After Loan	
	Frequency	Percent	Frequency	Percent
Yes	23	17.7	130	100
No	107	82.3	-	-
Total	130	100	130	100

Table 4.2.2-4 Beneficiaries response regarding the degree of contribution of loan to asset growth

Degree of Contribution	Frequency	Percent
Fully	12	9.2
Mostly	9	6.9
Partially	14	10.8
A little	56	43.1
None	39	30
Total	130	100

Moreover, as indicated in Table 4.2.1-3 above, most of the sampled WFCs (103) who get credit have completely abandoned the activities of collecting, carrying and selling fuel wood, which threatens their health and working condition. The abandonment of these activities by their freewill would also mean the empowerment of these women. Because it enabled them to choose the working environment conducive to their health and the activity from which they could generate relatively more income or even income equivalent to their earlier earnings from the sale of fuel wood. In general, improving the living and working condition of WFCs is also related to the enhancement of women's empowerment.

We can also compare the situation of WFCs before and after the loan by employing the methodology known as Wilcoxon Matched Pair's Non-Parametric Test. It is the non-parametric counter part of student's t-test of  $H_0: \mu = \mu_0$ . Non-Parametric (distribution free) tests do not rely on any assumption about certain properties of the parent population from which the sample is taken. To apply this test, we have to first find the differences between each pairs of values and assign rank to the differences from the smallest to the largest with out regard to their

sign (VanMatre, 1996:616-621). If the difference becomes zero (i.e. in the case of tied pairs), the observation will be dropped and the sample size will be reduced accordingly. The exact signs of each differences are then put to corresponding ranks and the sum of the positive ranks, symbolized by  $T^+$  or the sum of the negative ranks symbolized by  $T^-$  are computed. The test statistic will be either  $T^+$  or  $T^-$  depending on the alternative hypothesis (VanMatre, 1996:616-621).

If a variable  $Y$  is observed before and after a certain change, symbolized by  $Y_b$  and  $Y_a$  then the alternative hypothesis and the test statistics becomes:

<u>Alternative hypothesis</u>	<u>Test statistics</u>
$H1: Y_a < Y_b$	$T^+$
$H1: Y_a > Y_b$	$T^-$
$H1: Y_a \neq Y_b$	Smaller of $T^+$ or $T^-$

The null hypothesis will be rejected if the test statistic is equal to or less than the critical value given in  $W$  tables (i.e. Wilcoxon table shown in statistical books for number of observations  $(n) \leq 25$ ). For  $n > 25$  the distribution of both  $T^+$  and  $T^-$  can be considered normal with mean  $\mu_T$  and standard deviation  $\sigma_T$  defined as:

$Z = (T - \mu_T) / \sigma_T$  is the test statistic.

Based on this methodology, we can check whether living and economic condition of the borrower after the loan has been improved. This can be tested by using the "before and after" situations of the following variables. The variables considered here are income, consumption, medical and education expenditure.

Starting from income, if we denote borrower's mean income before and after loan as MIB and MIA, respectively, the null and alternative hypothesis can be specified as

$$H_0: MIB=MIA$$

$$H_1: MIA>MIB$$

The following test result is obtained using SPSS packages

Wilcoxon Matched- Paris Signed-Ranks Test.

MIB = Mean Monthly Household Income Before the Loan.

With MIA = Mean Monthly Household Income After the Loan

Mean Rank	Sum o f Ranks	Cases
35.55	355.50	10 - Ranks (MIA LT MIB)
65.39	7519.50	115 + Ranks (MIA GT MIB)
		<u>4 0</u> Ties (MIA EQ MIB)
		129 Total

$$Z = -8.827 \quad P = 0.000$$

This test result leads us to the rejection of the null at 1% significance level showing that the average monthly household income after loan is significantly greater than income before loan. Thus, the WFC/PCS or the Gasha Micro financing scheme has a positive impact on household income.

For medical expenditure, if we denote the mean annual medical expenditure of the household before and after loan by HMEB and HMEA, respectively, the null and the alternative can be specified as:

$H_0$ : Average annual household medical expenditure before loan is the same as after loan i.e.

HMEB EQ HMEA

$H_1$ : Average annual household medical expenditure after loan is greater than before loan i.e.,

HMEA GT HMEB.

The test result obtained by using SPSS gives the following.

Wilcoxon Matched-Paris Signed-Ranks Test

HMEB=Mean Annual Medical Expenditure Before Loan

HMEA=Mean Annual Medical Expenditure After Loan

Mean Rank	Sum of Ranks	Cases
18.42	629.50	13 - Ranks (HMEA LT HMEB)
47.35	3835.50	81 + Ranks (HMEA GT HMEB)
		<u>8</u> 0 Ties (HMEA EQ HMEB)
		102

Z = -6.055          P = 0.000

This test result leads us to the rejection of the null at 1 % significance level. So we accept the alternative hypothesis i.e., the mean annual household medical expenditure after the loan is significantly greater than the mean annual household medical expenditure before the loan. However, the increase in medical expenditure is usually associated with the occurrence of illness with in the household members or the illness may occur before the loan and a large sum of money may be spent before the loan rather than after the loan or they report that they have not encountered any illness in both periods. That is why we see 13 negative ranks and 8 ties above.

Regarding the case of educational expenditure, denoting the mean annual household educational expenditure before and after loan by MEEB and MEEA respectively, the null and alternative hypotheses are:

Ho: Mean annual household educational expenditure before the loan is the same as after the loan i.e.,  $MEEB=MEEA$ .

H1: Mean annual household educational expenditure after loan is greater than before loan i.e.,  $MEEA > MEEB$ .

The following results are obtained.

Wilcoxon Matched-Pairs Signed Ranks Test

MEEB= Mean Annual Educational Expenditure Before the Loan

With MEEA= Mean Annual Educational Expenditure before the Loan

Mean Rank	Sum of Ranks	Cases
48.57	728.50	15 - Ranks (MEEA LT MEEB)
48.49	3927.50	81 + Ranks (MEEA GT MEEB)
		<u>11</u> 0 Ties (MEEA EQ MEEB)
		107 Total

Z = -5.851

P = 0.000

Based on this test result we can reject the null at 1% significance level. So we reject the null in favour of the alternative hypothesis i.e. the mean annual household education expenditure after the loan is significantly greater than the mean annual household educational expenditure before the loan

As regards to consumption expenditure, if we denote the average monthly consumption expenditure before loan as HCEB and the average monthly consumption expenditure after loan as HCEA, then

$H_0$ : Average monthly household consumption expenditure before loan is the same as after loan  
i.e.,  $HCEB = HCEA$

$H_1$ : Average monthly household consumption expenditure after loan is greater than before loan  
i.e.,  $HCEA > HCEB$ .

The test result using SPSS yield the following:

Wilcoxon Matched-Pairs Signed -Rank Test.

HCEA=Monthly consumption expenditure after the loan.

HCEB=Monthly consumption expenditure before the loan.

Mean Rank	Sum of Ranks	Cases
78.83	709.50	9 - Ranks (HCEA LT HCEB)
57.90	6311.50	109 + Ranks (HCEA GT HCEB)
	<u>12</u>	0 Ties (HCEA EQ HCEB)
	130	Total

$$Z = -7.558$$

$$P = 0.000$$

The above test result leads us to the rejection of the null at 1% significance level. That is the average monthly household consumption expenditure after the loan is significantly greater than that of before the loan. This is also supported by the response of 97(75%) beneficiaries who

stated that nutritional status after the loan has increased as compared to the situation before the loan.

However, mere increase in income and expenditures size after the loan does not necessarily indicate improvements in living condition of the beneficiaries. This is due to the rising cost of living after the loan relative to the situation before the loan. That is, inflation and other factors that affect the borrowers' cost of living were not taken in to account. Moreover, as most of the beneficiaries are married and have children, the increase in the number of family size would also lead to the increase in household expenditure with out improving the consumption basket, nutritional status, etc of the beneficiaries household. Despite this limitation the above results from Wilcxon Matched Pairs Non-Parametric test shows improvements in living condition of these women. This can also be confirmed by the responses of beneficiaries in that 102 (78.5 %) of them reported the positive contribution of the credit program in improving their living standards. Therefore, all these improvements in education, health, nutritional status, income and expenditure after the loan are indicators of the positive contribution that these credit schemes made to its beneficiaries.

In relation to the above results, the other important point to be addressed is the trend in the number of program beneficiaries who were WFCs. At the beginning there was an intensive mobilization and hence increase in the trend of the membership (see Table 4.2.2-5).

Table 4.2.2-5 Number of WFCs who were program beneficiaries.

Year	Number of program beneficiaries
1996	220
1997	355
1998	539
1999	300

Source: Final Report of the pilot credit scheme for WFCs and available documents of CFO.

As can be shown from Table 4.2.2-5 there is a considerable decrease in the number of beneficiaries who were WFCs by the year 1999. Drop out is not a common problem among beneficiaries who were not WFCs. Though it is not included in the specific objectives of the study, it is advisable to have a brief look at the drop out problem in relation to the positive impact of the credit mentioned above. Focus group discussion was made with some of the beneficiaries who are dropouts. They claimed about the bimonthly repayment period as an unsuitable and a cause for increase in dropout. They asserted that they didn't earn any profit (or gain) from the money they borrow as their product or trade activities cannot generate any income within this short instalment repayment period. As stated above even a great number of the beneficiaries who are participating in the scheme reported that the repayment period is unsuitable. Others blamed the increase in interest rate from 10% (during the WFC/PCS) to 13% by Gasha micro financing Share Company as a reason for dropping out. But this interest rate is not too high to be blamed for because the lending institutions should have to get some income in the form of interest rate on the money they would lend to the borrower so as to cover the cost incurred in providing these services.

The other beneficiaries stated the failure of their business because of market saturation i.e.; many competitors forced them to dropout from the program. As described in Table 4.2.1-2 most of them engage in similar activities and end up in crises, which forces them to dropout. One of the dropouts from the Yekka branch stated group guarantee system as a factor that hindered her from participating in the credit scheme as one of her group member defaulted and the others too refused to refund the amount left unpaid.

Since only three years has elapsed after the start of the scheme, these dropouts did not even reach the five-year criteria of Khandker and Chowdhury to come out of poverty. From these we

can conclude that majority of these women dropout not because their economic and social life has improved but they did not get benefit from the program and they may not manage their businesses very well.

The other problem is that related to the operational problem of the borrower. Most of the beneficiaries state lack of working capital (50.8%) and market (47.7%) followed by product similarities (39.5%) as their major operational problem. These are fundamental problems that hinder many micro enterprise operators from graduating or from coming out of poverty through micro financing scheme.

Table 4.2.2-6 Number of respondents by major operational problem

Major operational problems	Number of Respondents	Percent
Inadequate skill	10	7.7
Lack of working capital	66	50.8
Shortage of input supply	37	28.5
Inadequate working premises	48	36.9
Lack of market	62	47.7
Product similarities	50	38.5
Others	34	26.2

### 4.3 Estimation of the Model and Analysis of the Results

Before we go to the estimation of the model, it is better to see the characteristics of our variables briefly. Table 4.3-1 shows us the minimum, maximum, median, mean and the standard deviation of each variable, which, to a certain extent, helps us to understand the nature of the variables used in the analysis of the model. The mean loan repayment performance of the borrower is 81% while the mean loan repayment rate is 94.6 %. From a total of 130 sampled borrowers, 105 repaid the loan in full (i.e., with loan repayment rate of 90% and above) where as the remaining 25 borrowers did not repay the loan in full (i.e., their loan repayment rate is below 90%). The

mean loan diversion rate of the borrower is 10.4 % while the mean age is 36 years. The average number of dependents with in the household is about four persons. The average values of loan size, mean monthly income and consumption expenditure of the households are 961.4, 318.1, 261.9 Birr respectively. As regards to education level, most of the beneficiaries are on average in between grade 1-4. This shows us that, on average, most of the beneficiaries are less educated.

Supervision, suitability of biweekly repayment period, availability of other income source and keeping accounting records are respectively reported as ‘yes’ by 82.3%, 37.7%, 29.2% and 31.5% of respondents on average.

Table 4.3-1 Summary Statistics of the Variables.

Variables	Min*	Max**	Median	Mean	Std. Dev.
Age	19.00	57.00	37	36.392	9.5877
Educational level	0	12	2	3.42	3.534
Number of dependents	0	10	5	4.63	2.4052
Frequency of loan	1	3	2	1.73	0.713
Loan size	110.00	1650.00	1100.00	961.400	360.6657
Suitability of loan repayment Period	0	1	0	.3769	.4865
Supervision	0	1	1	.8231	.3831
Income Sources other than the loan	0	1	0	.2923	.4566
Keeping accounting records	0	1	0	.3154	.4665
Mean monthly income after the loan	32.00	4500.00	212	318.1	435.783
Natural logarithm of mean monthly income	3.47	8.41	5.357	5.4325	.7435
Consumption expenditure	70.00	600.00	250	261.87	111.210
Square root of consumption expenditure	8.37	24.49	15.811	5.8132	3.4501
Loan diversion rate	0	1	0	.104	.2494
Loan repayment performance	0	1	1	.81	0.396
Fitted value of loan diversion rate	-2E-05	0.61	1.57E-05	.36	0.0962
Loan repayment rate	0.40	1	1	0.9457	0.114

Note: **Min\***=Minimum; **Max\*\***=Maximum

The mean for frequency of loan is 1.73, which approximates to the second round loan on average. The median is also 2 indicating borrowers with second round loan as the median borrower.

Although much is said in the literature, variables such as beneficiaries' attitude towards loan repayment, perceived cost of default, feeling of responsibility for the groups and interest rate were not used in the regression model as they have constant values across the borrowers.

In order to identify determinants of loan diversion and to get the fitted value of loan diversion rate, which is later used as a regressor in the loan repayment equation, we estimated a loan diversion equation by Tobit before the estimation of loan repayment performance model was made. The loan diversion equation was heteroscedastic. It is evident that the presence of heteroscedasticity would result in inconsistent estimator. To resolve this problem the model was corrected for heteroscedasticity based on the method proposed by Greene (1993: 968-969). The variance term in the Tobit model with multiplicative heteroscedasticity is modelled as

$$\sigma_i = \sigma e^{\gamma'z_i} \quad \text{where, } z \text{ is loan size in this study.}$$

The likelihood ratio test which is asymptotically distributed as chi-squared with degrees of freedom equal to the number of variables in the weights for heteroscedasticity is given by  $LR = -2(\ln L_0 - \ln L)$ . Where  $\ln L_0$  is the log likelihood for the model with homoscedasticity and  $\ln L$  is the log likelihood for the model with heteroscedasticity. Hence, for this model to reject or not to reject the null hypothesis that  $\gamma' = 0$ , we have to compare the value of LR with the critical value of chi-squared at one degrees of freedom i.e., taking loan size only as a variable representing  $z$ . That is,

$$LR = -2[(-51.57907 - (-49.27842))]$$

$$= 4.6013$$

But the critical value of chi-square, at one degree of freedom, is 3.84 and is less than the value of LR computed above. From this result we can say that the hypothesis of homoscedasticity can be rejected. Hence, the Tobit model with heteroscedasticity is estimated using the variable loan size as weighting variable.

Education level of the beneficiaries is positively related with loan diversion rate, but it is insignificant. Loan size and square root of consumption are positively related with loan diversion rate. However, both are insignificant in affecting loan diversion rate. Suitability of loan repayment instalment, supervision and keeping accounting records are negatively related to loan diversion rate as expected. However, the t-ratios and their p-values show that all of these three variables are insignificant.

Table 4.3.2 Maximum likelihood estimates of the Tobit loan diversion equation.

Variable	Coefficient	Z-value	P-Value
Educational level	0.0679	1.431	0.1526
Number of dependent	0.1159	1.709	0.0874
Loan size	-0.0005	-1.435	0.1512
Suitability of loan repayment/instalment	-1.3239	-1.139	0.2546
Supervision	-0.3513	-1.328	0.1841
Other income Sources	-0.7215	-1.612	0.1070
Keeping accounting records	-0.3975	-1.024	0.3060
Natural logarithm of income from businesses financed by the loan	-0.4178	-1.960	0.0500
Square root of household consumption expenditure	0.3732	0.982	0.3262
Constant	1.4435	1.358	0.1746
Sigma	0.2546	1.410	0.1586
Log-Likelihood			-49.27842

The only two variables, which are significant in the loan diversion equation, are number of dependents with in the households and the natural logarithm of income after the loan. While the former positively affects loan diversion rate at 10% level of significance, the latter affects it negatively at 5% level of significance.

The probit model for loan repayment performance has no problem of heteroscedasticity. Table 4.2-3 gives the estimates of the probit model. The likelihood ratio (LR) statistic, which is distributed chi-squared with 9 degrees of freedom [ $\chi^2 = -2[(-63.64175 - (-30.67901))]$ ] is equal to 65.92548 while the chi-squared critical value at 95% level is 16.92. Form this we reject the null hypothesis that the coefficients of the model are all equal to zero.

Table 4.3-3 Maximum likelihood estimates of the binomial probit model for full loan repayment performance equation.

Variable	Coefficient	Z-value	P-value
Age	-0.0383	-1.337	0.1811
Educational level	-0.1968	-2.363	0.0181
Frequency of loan	2.1044	3.489	0.0005
Loan size	-0.00037	-0.551	0.5817
Suitability of loan repayment period	1.1366	1.678	0.0933
Supervision	2.1292	3.743	0.0002
Other income Sources	0.8556	1.754	0.0794
Natural logarithm of Income	0.1133	0.330	0.7415
Fitted value of loan diversion rate	1.8547	0.956	0.3392
Constant	-2.2632	-1.169	0.2425
Log likelihood			-30.67901
Restricted log likelihood			-63.64175
L Rchi2 (9)			65.92548
Pseudo R <sup>2</sup> (Mc Fadden's R <sup>2</sup> )			.52
Count R <sup>2</sup>			0.86
Number of observations			130

Note: Mc Fadden's R<sup>2</sup> is calculated as,  $Mc\ Fadden's\ R^2 = 1 - LnL / LnLo$  where

LnL= is unrestricted log likelihood and

LnLo= is restricted log likelihood

Count R<sup>2</sup> =  $\frac{\text{Number of correct predictions}}{\text{Number of total observations}}$

Supervision is positively related with loan repayment performance at 1 % level of significance. This shows us that the WFC/PCS or currently Gasha micro financing scheme did best as regards to supervision.

The other important variable that affects the loan repayment performance is income from source other than the business financed by the loan. As borrowers have diverse and varied sources of income they can have alternative incomes through which they can effect their repayment when the loan-financed business becomes cool or declines. This income serves the borrower as an alternative of last resort. In this model, sources of income other than that generated from businesses financed by the loan positively and significantly affect loan repayment performance at 10% level of significance. Frequency of loan is positively and significantly (at 1% significance level) related with loan repayment performance. This indicates that borrowers who took loan frequently have got experience in their business activity and strengthen their ties with the staff and their fellow group members, which in turn facilitates the repayment of the loan in full. Moreover, suitability of loan repayment period is positively and significantly (at 10% level of significance) related with loan repayment performance. Education level, as it is expected to have a mixed impact, is negatively related with full loan repayment performance. The more educated beneficiaries may change their attitude towards social sanction or they may have access to greater information about the enforcement of the contract and the availability of various opportunities for them.

The other variables such as natural logarithm of income, loan size have their own expected sign, but are insignificant. In this study, fitted values of loan diversion rate and age are insignificantly related with loan repayment performance.

In this and the following paragraphs attempt is made to highlight a brief comparison of the major findings in this study with similar findings in Ethiopia. To begin with, Mengistu (1997:56-58) found education level and suitability of repayment period to be positively related with loan repayment performance for Awasa while the former variable has a negative sign in this study. For Bahir Dar supervision and income have positive impact on loan repayment performance. In my study, however, income from business financed loan has no effect while income from other sources and supervision has positive effects on loan repayment performance.

Like Mengistu (1997:56-58), Berhanu (1999:67-72) also reported that loan diversion rate and loan size are inversely related with loan repayment while both variables are insignificant in my study with the former taking a positive sign contrary to any of the previous findings. Other sources of income have unexpected negative sign for Berhanu (1999:67-72) while it is positive in this study. Almost similar results are obtained for variables such as supervision, perceived cost of default and suitability of repayment period. Both of them did not consider frequency of loan as a variable affecting loan repayment performance while it is highly significant and positively related with loan repayment performance in this study.

Regarding the impact of the loan Berhanu (1999:50-66) has arrived at positive result in terms of education, consumption and health expenditures and nutritional status but found the absence of saving facility for the borrowers at that time. In this study, however, credit has brought a positive impact not only to the above mentioned variables but also to the working conditions of the beneficiaries in particular and to their empowerment in general.

## CHAPTER FIVE

### Conclusion and Policy Implications

#### 5.1 Conclusion

The WFCs pilot credit scheme was designed to support the women fuel wood carriers in Addis Ababa through the provision of credit. It enabled these women to create alternative income generating activities rather than engaging in gathering, carrying and selling fuel wood, which is occupationally harmful and environmentally unfriendly. This is confirmed by the abrupt shift of WFCs to other alternative income generating activities due to the loan. Currently Gasha Micro finance Share Company continues with these activities after the pilot credit scheme has been phased out. Both schemes have contributed to the empowerment of these women by enabling them to play a greater role in the household's decision making. The increased share of their household expenditure, income, saving and their participation in various training and meetings reflects the empowerment of these women due to the loan. In this process it also improved their living and working condition. Generally, the study shows us that micro credit enabled most of these women to contribute or even solely to cover various types of household expenditures, to develop saving behaviour, to increase their income, enhance their participation in group or centre meetings and helped them to engage in to other alternative income generating activities.

Most of them reported that they know the importance (use value) of the forest trees and are willing to participate into integrated forest management. They also have the perception that the forest stock of the city is continuously declining and are interested to conserve it. The study indicated that provision of credit to these few beneficiaries, who are women fuel wood carriers, may not reduce the forest stock of the city from declining. The paradox here is that micro

financing WFCs helped them to stop this activity on one hand while it attracts the new carriers who have no access to credit to enter into this activity on the other hand. This is so because of the increase in the demand for fuel wood by the Addis Ababa consumer. A shift of some women fuel wood carriers to other alternative income generating activities may lead to a rise in the price of fuel wood (other things being constant), which in turn attracts other new carriers to this activity. Even though the schemes have contributed a lot to solve the problem of the WFCs, currently there is an increase in the number of dropouts due to shorter repayment period, slack in business or lack of market, many competitors and increase in interest rates and other expenses. Related to this are the operational problems facing the borrowers, which needs closer investigation by the lending institution.

For this micro financing activity to continue in a sustainable way improving the living (economic) conditions of the borrower and reducing increased dropout of the beneficiaries is not suffice. It is also essential to have better loan repayment performance. Hence, examining factors that affect loan repayment performance has crucial importance to it.

Loan diversion though insignificant in affecting loan repayment performance is significantly affected by number of dependents with in the household and by income of the beneficiaries. The former increases loan diversion rate while the latter decreases it.

In the earlier discussion about determinants of loan repayment performance it was found that educational level significantly affected loan repayment performance. But its sign indicates the possibility of having inverse relationship between educational level and loan repayment performance. According to this result more educated people have the probability of not repaying loans as they can get jobs somewhere else. Hence, they may not bother for losing

future access to credit from that specific lending institution. Frequency of loan significantly and positively affects loan repayment performance of the borrower. The result for this variable coincides with our expectation. The other important variable is adequacy of supervision. This variable influences loan repayment performance significantly and positively. Its sign and significance goes with our expectation. Income sources other than income from business financed by the loan also affects loan repayment performance positively and significantly. The result for this variable too supports our expectation. Suitability of loan repayment period also affects the dependent variable positively and significantly.

Social sanction and claims against guarantors or group pressure are the most effective tools for facilitating loan repayment performance as ranked first or second by the respondents among the various costs of defaults.

## **5.2 Policy Implications**

From the findings of this study the following policy implications are made. Since provision of credit for all of WFCs in Addis Ababa is not plausible, integrating these women into forest management and utilization system seems to be feasible. Hence, the need for coordinated efforts to integrate them into any forest management policy so that they can use or supply the forest resources in a sustainable manner. Since only the government cannot supply and meet the increasing demand for fuel wood by the Addis Ababa consumers, integration of these women into fuel wood plantation and forestry management is also essential. Both micro financing, which aim at poverty reduction and integration of women into forest management and utilization system (i.e., to manage and utilize the forest resources sustainability) must be

coordinated to mitigate the problem of WFCs and the deforestation problem associated with it. Both strategy can be adopted simultaneously at least to resolve this conflicting issues.

Since most of the beneficiaries reported that the bi-weekly repayment period is unsuitable, loan repayment period that matched with the repayment capacity of the borrower must be decided through continuously assessing the opinion and business plan of the borrower so as to avoid the default problem associated with this situation. According to the result obtained from this study one month is recommended as a suitable repayment period for these beneficiaries.

The other related issue that should be given priority by this micro financing institution is the consideration of the fundamental causes for the increasing drop out rate of the beneficiaries who were WFCs. To minimize this increasing trend in the number of drop out, it is better to design appropriate repayment period that matches with the borrower repayment capacity. Moreover, it is better to study at least the profitability of the business (activities) proposed by the borrower and the presence of potential market for their product (activities) before providing them the loan amount they have requested. This also helps to reduce the operational problems faced by many borrowers.

As regards to the determinants of loan repayment performance frequency of loan, supervision of the loan, suitability of loan repayment period and other income sources other than the loan are factors to be emphasized and encouraged by Gash Micro finance Share Company in designing a strategy for effective loan recovery system. That is, repeat borrower, continuous follow-up of the beneficiaries, repayment period that coincides with the repayment ability of the borrowers and borrowers with diverse sources of income should be encouraged and are areas that must be given priority or special concern by this micro financing institution in its

lending policy. Since educated beneficiaries have access to various job opportunities and alternatives than the uneducated one, they may not bother too much for not repaying their debt. Hence, borrowing to them must have to be followed by strict supervision and follow-up.

Moreover, these lending agencies must continue in using social collateral such as group- based lending strategy and social sanction, which is inherent in the culture and religious mores of the society, as a factor for enforcing loan repayment.

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APPENDIX

QUESTIONNAIRE FOR THE SURVEY ON "WOMEN FUEL WOOD CARRIERS AND  
MICRO FINANCE: THE CASE OF WOMEN FUEL WOOD CARRIERS IN ADDIS  
ABABA"

CODE: \_\_\_\_\_

ZONE: \_\_\_\_\_

KEBELE: \_\_\_\_\_

ENUMERATOR: \_\_\_\_\_

WOREDA: \_\_\_\_\_

HOUSE No: \_\_\_\_\_

DATE: \_\_\_\_\_

SECTION I: PERSONAL CHARACTERISTICS OF THE BORROWER

- 1.1. Name \_\_\_\_\_
- 1.2. Age \_\_\_\_\_
- 1.3. Martial Status \_\_\_\_\_
1. Single 3. Married  
2. Divorced 4. Widowed 5. Separated
- 1.4. Educational level of the borrower: \_\_\_\_\_
- 1.5. Household size: \_\_\_\_\_
- 1.6. Number of dependents:
1. With in the household: \_\_\_\_\_
2. Outside the household: \_\_\_\_\_

SECTION II: ISSUES CONCERNING LOAN AND ITS REPAYMENT

- 2.1 If you have previous access to credit from sources other than the women fuel wood carriers pilot credit scheme or Gasha Micro-financing Share Company (G.M.S.C) state the amount you borrowed and the time you received loan.  
Amount in Birr \_\_\_\_\_ Month and Year \_\_\_\_\_
- 2.2. For what purpose did you take the loan?  
\_\_\_\_\_  
\_\_\_\_\_
- 2.3. Have you repaid the total loan as agreed in the loan contract? \_\_\_\_\_ 1. Yes 2. No
- 2.4. If no, state the total balance left unpaid and the reason for its non-repayment?  
Amount left unpaid in Birr: \_\_\_\_\_  
Reason: \_\_\_\_\_
- 2.5. How many times did you take the loan from either women fuel wood carriers pilot credit scheme (WFC/PCS) or from Gasha Micro-financing Share Company (G.M.S.C) or both? \_\_\_\_\_
- 2.6. How much money did you borrow from either credit scheme in each rounds of loan? State the amount of loan issued and repaid.
- |                   | Loan Size      | Year of Loan     | Year of Loan |
|-------------------|----------------|------------------|--------------|
|                   | <u>In Birr</u> | <u>Repayment</u> |              |
| First round loan  | _____          | _____            | _____        |
| Second round loan | _____          | _____            | _____        |
| Third round loan  | _____          | _____            | _____        |
- 2.7. If you pay interest for the loan, what is the rate per annum? \_\_\_\_\_
- 2.8. Would you state the purpose for which you took the loan and the amount spent accordingly? \_\_\_\_\_

Intended purposes

Amount in Birr

- |    |       |       |
|----|-------|-------|
| 1. | _____ | _____ |
| 2. | _____ | _____ |
| 3. | _____ | _____ |
| 4. | _____ | _____ |
| 5. | _____ | _____ |

2.9. Was the loan sufficient to undertake your intended purposes? \_\_\_ 1. Yes 2.No

2.10. Did you spend the entire loan on purposes specified in the loan agreement? \_\_\_ 1. Yes  
2. No

2.11. If no, state those non-intended purposes and the amount spent on them.

- |    | <u>Item</u> | <u>Amount in Birr</u> |
|----|-------------|-----------------------|
| 1. | _____       | _____                 |
| 2. | _____       | _____                 |
| 3. | _____       | _____                 |
| 4. | _____       | _____                 |
| 5. | _____       | _____                 |

2.12. What factor led you to spend all or part of the loan on this (these) non intended purpose(s)? \_\_\_\_\_

2.13. Was the loan issued at the time you need it? \_\_\_\_\_ 1. Yes 2.No

2.14. If no, specify the consequence of the delay

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

2.15. How many days or months are given to you to prepare yourself for loan repayment?

2.16. What was the installment repayment period for each rounds of loan? \_\_\_\_\_

1. Weekly
2. Bi-weekly
3. Monthly
4. Other (Specify)

2.17. What was the amount of loan repayment per installment for each rounds of loan?

2.18. Was the repayment installment period suitable for performing your loan repayment?  
\_\_\_\_\_ 1. Yes 2. No

2.19. If no, mention the reason and recommend the repayment period that seems suitable to you.

Reason: \_\_\_\_\_

Recommended repayment period: \_\_\_\_\_

2.20. Would you state the outstanding balance that you are required to pay? \_\_\_\_\_

2.21. What is your opinion about loan repayment? \_\_\_\_\_

1. Loan must be repaid.
2. Loan must be partially repaid
3. Loan must not be repaid
4. Others (specify)

2.22. Do you perceive the cost of default to be high? \_\_\_\_\_ 1. Yes 2.No

2.23. If yes, to which cost of default do you give emphasis? Put in order of importance

1. The claim against personal wealth
2. The claim against guarantees
3. Social sanction such as loss of social status
4. Loss of future access to credit

- 2.24. Were/are you required to form a group so as to get credit for your business? \_\_\_\_\_  
 1. Yes      2. No
- 2.25. If your answer is yes, how many members did/does your group have? \_\_\_\_\_
- 2.26. Did you know all of your group members? \_\_\_\_\_ 1. Yes    2. No
- 2.27. Did you feel responsible to other members of your group? \_\_\_\_\_ 1. Yes    2. No

### SECTION III: SUPERVISION

- 3.1. Has there been any supervision on loan utilization from the project or GMSC's staff?  
 \_\_\_\_\_ 1. Yes      2. No
- 3.2. Has there been supervision on loan utilization and repayment from government organization? \_\_\_\_\_ 1. Yes      2. No
- 3.3. If there is supervision, do you think that it is adequate? \_\_\_\_\_ 1. Yes    2. No
- 3.4. If your answer is "inadequate", do you think that it contributes to non-repayment of loan? \_\_\_\_\_ 1. Yes      2. No
- 3.5. Do you consider supervision as the major cause for loan repayment? \_\_\_\_\_ 1. Yes      2. No
- 3.6. If no, specify your reason. \_\_\_\_\_

### SECTION IV: TRAINING

- 4.1. Have you been given any kind of training by the project, FWPCA or by G.M.S.C. before the loan is provided to you? \_\_\_\_\_ 1. Yes      2. No
- 4.2. If yes, specify the kind of training given to you? \_\_\_\_\_
- |                            |  |
|----------------------------|--|
| 1. Business training       | 4. Saving and credit training          |
| 2. Market training         | 5. Book-keeping and recording training |
| 3. Administrative training |  |
- 4.3. Do you think that the training given to you has helped to increase your income?  
 \_\_\_\_\_ 1. Yes      2. No

### SECTION V: INCOME AND WEALTH

- 5.1. Did you have any source of income for your family before the loan? \_\_\_\_\_ 1. Yes      2. No
- 5.2. If yes, state the source(s) and the average level of income you get per month  
 Source(s) of income: \_\_\_\_\_  
 Level of income in Birr: \_\_\_\_\_
- 5.3. What is the mean monthly income of your business financed by the loan? \_\_\_\_\_
- 5.4. Do you have other sources of income after you have got access to the loan? \_\_\_\_\_  
 1. Yes    2. No
- 5.5. If yes, specify the source(s) and the average level of income.  
 Source(s) of income: \_\_\_\_\_  
 Average monthly income (in Birr): \_\_\_\_\_
- 5.6. Did you have any assets before you got access to the loan? \_\_\_\_\_ 1. Yes    2. No
- 5.7. If yes, specify the estimated value of your assets (including assets for purposes other than your business) before the loan. \_\_\_\_\_
- 5.8. What is the estimated value of your assets after the loan? \_\_\_\_\_
- 5.9. If your asset grows after the loan, how far does the loan contribute to the growth of your assets? \_\_\_\_\_
- |              |             |
|--------------|-------------|
| 1. Fully     | 4. A little |
| 2. Mostly    | 5. None     |
| 3. Partially |             |

## SECTION VI: EMPLOYMENT AND WORKING CONDITION

- 6.1. What was the major type of activities you were engaged in before participation in the credit schemes? Put in their order of importance \_\_\_\_\_
- \_\_\_ 1. Fuel wood collecting, carrying and selling
  - \_\_\_ 2. Selling bread / injera/ ambasha
  - \_\_\_ 3. Petty trading
  - \_\_\_ 4. Handicrafts
  - \_\_\_ 5. Housemaid
  - \_\_\_ 6. Preparing and selling local drinks
  - \_\_\_ 7. Others (specify)
- 6.2. If your major or sole activity was fuel wood carrying and selling, what was your frequency in collecting and carrying fuel wood before you got access to credit? \_\_\_\_\_
1. Almost daily
  2. Once in a week
  3. Bi-weekly
  4. Monthly
  5. Others (specify)
- 6.3. What is your frequency in collecting, carrying and selling fuel wood after your participation in the credit scheme? \_\_\_\_\_
1. Weekly
  2. Monthly
  3. Once in a year
  4. Complete abandonment
  5. Others (specify)
- 6.4. What were the health problems that you face because of the heavy load and long distance covered while engaging in this activity?
1. Chest and back pain
  2. Deformed spinal column
  3. Broken legs / heads or falling
  4. Stress and sever headache
  5. Miscarriage
  6. Eye sight deficiency
  7. Others (specify)
- 6.5. What problem other than health problem did you face while collecting and carrying fuel wood to the Addis Ababa consumers (Multiple answer is possible) \_\_\_\_\_
1. Harassment by forest guards
  2. Confiscation of your bundles
  3. Lack of access to kindergarten for your children while you went to the forest for gathering fuel wood
  4. Others (specify)
- 6.6. What type of labor did you use before your participation in the credit scheme? \_\_\_\_\_
1. Own labor only
  2. Own and your family labor
  3. Hired labor and own labor
  4. Hired labor and family labor
  5. Hired, family, and own labor
  6. Others (specify).
- 6.7. If you did not use your own labor only, specify the number of workers by each category.
- Family labor: \_\_\_\_\_ other (specify): \_\_\_\_\_
- Hired labor: \_\_\_\_\_
- 6.8. What are the major types of activities you are engaged in after you have participated in the

credit schemes? Put in order of importance \_\_\_\_\_

- \_\_\_ 1. Selling bread / injera/ambasha
- \_\_\_ 2. Weaving and spinning
- \_\_\_ 3. Poultry, milk cow, sheep fattening and trading
- \_\_\_ 4. Basket making
- \_\_\_ 5. Tree nursery (tree seedling) and vegetable production
- \_\_\_ 6. Carpet and embroidery
- \_\_\_ 7. Employed workers of the project
- \_\_\_ 8. Collective fuel wood trading
- \_\_\_ 9. Household furniture making
- \_\_\_ 10. Running kiosk or tea-room
- \_\_\_ 11. Fuel wood carrying and selling as before the loan
- \_\_\_ 12. Mini – Restaurant
- \_\_\_ 13. Others (specify)

6.9. What type of labor are you using for the activities that you are engaged in?

1. Own labor only
2. Own labor and your family's labor
3. Own labor and hired labor
4. Family labor and hired labor
5. Family labor, hired labor and your labor
6. Others (specify)

6.10. If you don't use your own labor only, specify the number of workers by each category after credit schemes?

Family labor \_\_\_\_\_ others (specify) \_\_\_\_\_  
Hired labor \_\_\_\_\_

#### SECTION VII: ACCESS TO MEDICAL SERVICES AND MEDICAL EXPENDITURE

- 7.1. Did your family and yourself have access to public health services before participation in the credit schemes? \_\_\_\_\_ 1. Yes 2. No
- 7.2. If yes, who covered your household's medical expenditure? (More than one answer is possible) \_\_\_\_\_
1. My self only
  2. Other family members
  3. Relatives
  4. Free user of medical services
  5. Myself and other family members
  6. Others (specify)
- 7.3. Do your family and yourself have access to public health facilities after the loan? \_\_\_\_\_ 1. Yes 2. No
- 7.4. If yes, who pays your medical expenditure? (Multiple answer is possible) \_\_\_\_\_
1. My self only
  2. Other family members
  3. Relatives
  4. Free medical service users
  5. Yourself and other family members
  6. Others (specify)
- 7.5. Did your family and yourself have access to private medical facilities before the loan? \_\_\_\_\_ 1. Yes 2. No

- 7.6. Do your family and yourself have access to private medical facilities after the loan?  
 \_\_\_\_\_ 1. Yes 2. No
- 7.7. How much was your annual medical expenditure for yourself and for your household on average before you got access to the loan? Amount \_\_\_\_\_ Birr
- 7.8. How much money do you spend on average in a year for your and your family's medical expenditure after you get access to the loan? Amount \_\_\_\_\_ Birr
- 7.9. Is there any improvement in your and your family's access to medical facilities after your participation in the credit schemes? \_\_\_\_\_ 1. Yes 2. No
- 7.10. If no, indicate the main reason? \_\_\_\_\_  
 1. Shortage of medical facilities  
 2. The high price requested by medical facilities  
 3. Low level of income  
 4. Other (specify)

### SECTION VIII: ACCESS TO EDUCATION AND EDUCATIONAL EXPENDITURE

- 8.1. If you have children or other dependents that are children, how many of them have access to education?  
 Before the loan: \_\_\_\_\_  
 After the loan: \_\_\_\_\_
- 8.2. How much is your annual household expenditure on education?  
 Prior to the loan \_\_\_\_\_  
 After the loan \_\_\_\_\_
- 8.3. If you were school dropout at the time of loan issue, mention the main factor that led you to interrupt schooling? \_\_\_\_\_
- 8.4. If you/your children were a school dropout, are you/your children able to continue education after the loan? \_\_\_\_\_ 1. Yes 2. No
- 8.5. If you/your children were grade 12 complete, are you/your children able to continue further education after the loan? \_\_\_\_\_ 1. Yes 2. No
- 8.6. Do you think that your/your children's access to educational facilities improved following the loan? \_\_\_\_\_ 1. Yes 2. No
- 8.7. If no, would you indicate the major reasons? \_\_\_\_\_  
 1. Shortage of educational facilities  
 2. The high price requested by educational institutions  
 3. Low level of income  
 4. Other (specify)

### SECTION IX: CONSUMPTION AND NUTRITIONAL STATUS

- 9.1. How much was the estimated monthly consumption expenditure of your household before the loan? \_\_\_\_\_
- 9.2. Who was the bearer of consumption expenditure before you got access to the loan?  
 (More than one answer is possible) \_\_\_\_\_  
 1. My self  
 2. Other family members  
 3. My self and other family members  
 4. Relatives  
 5. My self, other family members and relatives  
 6. Others (specify)
- 9.3. How much money does your household spend per month for consumption purposes after

- the loan is advanced to you? \_\_\_\_\_
- 9.4. Who covers consumption expenditure after you have got access to the credit schemes?  
(More than one answer is possible) \_\_\_\_\_
1. My self only
  2. Other family members
  3. My self and other family members
  4. Relatives
  5. My self, other family members and relatives
  6. Others (specify)
- 9.5. If there is increase in consumption expenditure of your household or if there is improvement in nutritional status of your family, is it associated with a rise in income from business financed by the loan? \_\_\_\_\_ 1. Yes 2. No
- 9.6. If yes, do you think that the nutritional status of your family has improved after you get access to the loan? \_\_\_\_\_ 1. Yes 2. No

### SECTION X: INPUT USE AND PRICE INFORMATION

- 10.1. If you used purchased inputs for your business or production before the loan, how much money did you spend per month on the purchase of these inputs? \_\_\_\_\_
- 10.2. If you use purchased inputs after you have got access to credit, how much money do you spend per month in the purchase of these inputs? \_\_\_\_\_
- 10.3. Does your expenditure on input have increased after your participation in the credit scheme? \_\_\_\_\_ 1. Yes 2. No
- 10.4. Was the price for your product favorable after the credit? \_\_\_\_\_ 1. Yes 2. No
- 10.5. If no, specify the reason? \_\_\_\_\_
- 10.6. What was the trend in your business? \_\_\_\_\_
1. Constant
  2. Increasing
  3. Decreasing
- 10.7. If increasing what are the reasons for increment? (multiple answer is possible).
1. Favorable price
  2. Locational advantage
  3. Product quality
  4. Other (specify)
- 10.8. If decreasing, is it because of \_\_\_\_\_
1. Unfavorable price
  2. Locational disadvantage
  3. Quality disadvantage
  4. Others (specify)

### SECTION XI: SAVINGS AND USE OF ACCOUNTING SYSTEM

- 11.1. Did you have a saving account before your participation in the credit scheme?  
\_\_\_\_\_ 1. Yes 2. No
- 11.2. If yes, what was your estimated monthly saving? Birr \_\_\_\_\_
- 11.3. Do you have a saving account after the loan? \_\_\_\_\_ 1. Yes 2. No
- 11.4. If yes, specify the amount you save per month? Birr \_\_\_\_\_
- 11.5. Do you keep accounting records for your business daily operations? \_\_\_\_\_ 1. Yes 2. No
- 11.6. If yes, for what purpose do you keep accounting records? \_\_\_\_\_
1. For tax purpose
  2. For evaluation of profit and loss
  3. For loan repayment purposes
  4. Other (specify)

**SECTION XII: INFORMATION REGARDING THE RELATION BETWEEN FOREST RESOURCES SURROUNDING THE CITY OF ADDIS ABABA AND THE WOMEN FUEL WOOD CARRIER**

- 12.1. Do you know any other uses of the forest other than being a source of your income?  
\_\_\_\_\_ 1. Yes 2. No
- 12.2. If yes, specify some of these other uses of the forest resource that you know about? \_\_\_\_\_
- 12.3. What is your perception about the stock level of the forest resources surrounding the city? \_\_\_\_\_  
1. Continuously decreasing  
2. Continuously increasing  
3. Stable
- 12.4. If your answer is decreasing, do you think that the following factors could be some of the major reasons for its decrease? (put them in order of importance) \_\_\_\_\_  
1. Gathering of leaves, twigs, branches and barks of the tree by WFCs and the increase in the number of these harvesters  
2. Due to the increased demand of wood for the construction and other household furniture  
3. Forest guards were unable to effectively control illegal cutting by any unlicensed and inexperienced person, which disrupts the rotation cycle of the trees  
4. Absence of adequate replantation
- 12.5. Did you believe that your and other WFC's activity, which is fuel wood gathering and carrying for sale, contributes to the degradation of the forests? \_\_\_\_\_ 1. Yes 2. No
- 12.6. Do you think that micro finance for women fuel wood carriers could reduce the pressure on the forest resource by helping these women to divert to other alternative income generating activities? \_\_\_\_\_ 1. Yes 2. No
- 12.7. Do you agree with the idea that "the shift of the WFC's, who have access to loan to other alternative income generating activities would lead to their immediate replacement by other new carriers who were not target beneficiaries of the loan"? \_\_\_\_\_ 1. Yes 2. No
- 12.8. Are you eager to be integrated into any forest management or forest policy? Why?  
1. Yes; reason \_\_\_\_\_  
2. No; reason \_\_\_\_\_

**SECTION XIII: OTHER INFORMATION**

- 13.1. How long is it since you started to participate in the credit scheme provided to WFCs? Month and year \_\_\_\_\_
- 13.2. How long is it since the establishment of your business? \_\_\_\_\_ Year and \_\_\_\_\_ month
- 13.3. Do you believe that you have benefited from the scheme? \_\_\_\_\_ 1. Yes 2. No
- 13.4. If no, why didn't you really benefit? \_\_\_\_\_
- 13.5. Do you briefly state the major operational problems you encountered since your

participation in the credit scheme? (More than one answer could be possible) \_\_\_\_\_

1. Inadequate skill
2. Lack of working capital
3. Shortage of input supply
4. Lack of land for fuel wood plantation, regeneration and for any other activities
5. Inadequate working premises
6. Lack of market for your product
7. Production of similar (homogenous) product by many of the beneficiaries
8. Others (specify)

**DECLARATION**

*I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university. All sources of materials used for the thesis have been duly acknowledged.*

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