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Research for

**The Impact of Access to Microfinance Credit on Multidimensional Poverty Index (MPI)
Reduction Among Female-Headed Households in Wukro Town, Eastern Zone, Tigray
Region, Ethiopia**

**Submitted in partial Fulfillment of the Requirement for the Master of Science degree in
Development Economics**

By: - Fasil Adane

ID No: - cbe /pse/020/10

Advisor: Kidanemarim Gebregziabher (PhD)

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Mekelle, Ethiopia

**The Impact of Access to Microfinance Credit on Multidimensional
Poverty Index (MPI) Reduction Among Female-Headed Households
in Wukro Town, Eastern Zone, Tigray Region, Ethiopia**

A Thesis Submitted to Department of Economics

College of Business and Economics

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In Partial Fulfillment of the Requirement to the Degree of

MASTER OF ARTS IN DEVELOPMENT ECONOMICS

BY

Fasil Adane

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Mekelle, Tigray, Ethiopia

DECLARATION

I, the undersigned, declare that this thesis entitled: “The Impact of Access to Microfinance Credit on Multidimensional Poverty Index (MPI) Reduction Among Female-Headed Households in Wukro Town, Eastern Zone, Tigray Region, Ethiopia” is my original work and has not been presented for a degree in any other university or institution. To the best of my knowledge, all sources of materials used for this thesis have been duly acknowledged and properly cited. This thesis is submitted in partial fulfillment of the requirements for the Master’s Degree in Development Policy Analysis at the Department of Economics, College of Business and Economics, Mekelle University. It has been carried out under the guidance and supervision of Kidanemarim Gebregziabher (PhD).



Faisl Adane
Student Name

Signature

18/11/2025
Date

Approval

Kidanemariam Gebregziabher (PhD)

Major Advisor

Signature

Date

Co-advisor

Signature

Date

External Examiner

Signature

Date

Internal Examiner

Signature

Date

Postgraduate Coordinator

Signature

Date

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ABSTRACT

This study examines the impact of access to microfinance credit on multidimensional poverty (MPI) among female-headed households in Wukro Town, Tigray Region, Ethiopia. Employing a mixed-method approach that combines quantitative household surveys with qualitative interviews, the research investigates how microfinance influences income, education, health, and overall living standards. The findings indicate that microfinance significantly reduces multidimensional poverty by enabling women to start or expand small businesses, support children's education, and access basic healthcare and food. However, microfinance alone does not fully address the deeper challenges in post-conflict settings; many households continue to face psychosocial stress, limited social inclusion, and unstable income due to market fluctuations. These results align with the multidimensional poverty frameworks of (Sen, 1999) and (Alkire, 2015), emphasizing the need to integrate financial services with social, psychological, and community support. The study concludes that while microfinance is a critical tool for economic empowerment, its long-term effectiveness in reducing MPI in conflict-affected areas requires complementary interventions such as mental health support, gender-sensitive programming, and broader post-conflict rehabilitation.

Keywords: *microfinance, multidimensional poverty index, female-headed households, post-conflict development, Wukro, Tigray, Ethiopia.*

LIST OF ACRONYMS

BoARD	Bureau of Agriculture and Rural Development
CSA	Central Statistic Authority
ETB	Ethiopian Birr
IFAD	International Fund for Agricultural Development
GDP	Gross domestic product
MDG	Millennium development program
MFIs	Microfinance Institutions
NBE	National Bank of Ethiopia
UN	United Nations
UNDP	United Nations Development Program
WTPFO	Wukro town plan and finance office
OPHI	Oxford Poverty and Human Development Initiative

UNIT ONE

1. INTRODUCTION

1.1 Background Information

Poverty is a complex, multidimensional phenomenon encompassing inadequate income, limited education, poor health, insufficient access to basic services, and political and social marginalization (Aminu, 2018). Globally, over 700 million people live in extreme poverty, while approximately 2.6 billion lack access to adequate sanitation (UNDP, 2020). In sub-Saharan Africa, poverty is particularly severe among rural populations due to limited access to financial services, education, and healthcare. In Ethiopia, about 23.5% of the population lives below the poverty line, with rural areas experiencing higher levels of deprivation (World Bank, 2020). These conditions are further exacerbated by high population growth, environmental degradation, and limited infrastructure, which constrain opportunities for sustainable development.

The concept of poverty has evolved from purely income-based measures to multidimensional frameworks that capture deprivations in health, education, and living standards (Alkire and Jahan, 2018). The Multidimensional Poverty Index (MPI) evaluates households across ten indicators, including child mortality, nutrition, years of schooling, enrollment, access to clean water, electricity, sanitation, and housing conditions. Households experiencing severe deprivation in multiple dimensions are classified as multi-dimensionally poor, highlighting the interlinked nature of poverty determinants (Sen, 1999; Alkire and Jahan, 2018).

Microfinance, defined as the provision of small loans, savings, and other financial services to underserved populations, particularly women, has been promoted as a key poverty alleviation tool (Yunus, 2007). In theory, access to microfinance enhances income generation, asset accumulation, and economic empowerment, thereby enabling households to invest in education, health, and livelihoods (Kabeer, 2015). Globally, over 1.7 billion adults remain unbanked, many of whom could benefit from microfinance services, while only 34% of sub-Saharan Africans have access to formal financial institutions (Global Findex Database, 2017; World Bank, 2017).

In Ethiopia, formal microfinance services were established in 1994/95 under the government's Licensing and Supervision of Microfinance Institutions Proclamation and expanded under Proclamation No. 40/1996, which enabled the National Bank of Ethiopia to license and regulate MFIs. Currently, more than 40 MFIs operate in Ethiopia, serving millions of clients, with women

constituting the majority (National Bank of Ethiopia, 2020; UNDP, 2020). In Tigray, microfinance institutions have facilitated access to credit for women and marginalized households; however, access remains constrained in rural and conflict-affected areas due to limited infrastructure, socio-economic marginalization, and ongoing post-conflict challenges (Teferi, 2011; Kintamo, 2018).

Female-headed households, particularly in post-conflict regions like Wukro Town, face unique barriers to poverty alleviation. These include social exclusion, lack of collateral, trauma from conflict, and limited participation in economic decision-making. While microfinance can improve household income, its effect on broader multidimensional poverty indicators, such as health, education, and social inclusion, remains unclear (Garikipati *et al.*, 2017; Niaz and Iqbal, 2019). Previous studies in Tigray have primarily focused on income generation, with limited attention to non-economic dimensions of poverty or the specific challenges faced by women-headed households in post-conflict settings (Teferi, 2011; Kintamo, 2018).

This study aims to fill these gaps by examining how access to microfinance credit affects the multidimensional poverty of female-headed households in Wukro Town. By integrating both economic and non-economic dimensions of poverty, the research provides a comprehensive understanding of microfinance's role in post-conflict poverty reduction. It also highlights the need for complementary interventions, such as gender-sensitive programming, mental health support, and social reintegration, to ensure sustainable improvements in well-being for vulnerable households.

1.2 Statement of the Problem

The Tigray region of Ethiopia has endured a devastating conflict that has severely disrupted the livelihoods of its population, particularly female-headed households. These households, already vulnerable due to socio-economic marginalization, face compounded challenges such as economic instability, displacement, and the erosion of social structures. Limited access to financial resources further exacerbates these conditions, deepening poverty and restricting recovery opportunities. Microfinance has emerged as a potential instrument for poverty alleviation and women's empowerment in many developing contexts (Yunus, 2007; Kabeer, 2015). However, its impact on multidimensional poverty, which encompasses not only income but also health, education, and social inclusion, remains underexplored, especially in post-conflict settings like Tigray (Sen, 1999; Alkire, 2015).

Theoretically, microfinance empowers women by providing financial means to enhance income generation, decision-making power, and overall well-being (Yunus, 2007; Kabeer, 2015). Yet, in post-conflict environments, its effectiveness is often constrained by non-economic barriers such as trauma, displacement, and weakened social networks (De Mel, 2015; Moser, 2007). These unique conditions may limit women's ability to fully benefit from financial interventions, calling for a holistic understanding of microfinance's effects beyond purely economic outcomes.

While existing studies have shown that microfinance can increase household income, savings, and consumption (Kintamo, 2018; Niaz and Iqbal, 2019), most have narrowly focused on economic dimensions of poverty. Few have incorporated a multidimensional perspective that considers education, health, and psychosocial well-being (Islam, 2021; Luan, 2015). Moreover, in conflict-affected areas, microfinance may stabilize income but fail to address non-financial deprivations such as mental health challenges, social exclusion, or educational setbacks (Banerjee *et al.*, 2018). Thus, a comprehensive analysis of microfinance's contribution to multidimensional poverty reduction is essential.

Despite progress in empirical approaches, methodological limitations persist. Many studies rely on Propensity Score Matching (PSM) to estimate program effects. While PSM helps control observable differences between participants and non-participants, it cannot account for unobserved factors—such as entrepreneurial motivation, social capital, or risk tolerance—that influence both access to microfinance and poverty outcomes. These unobserved variables introduce endogeneity bias, undermining causal interpretation. To address this issue, this study employs an instrumental variable (IV) approach, which corrects for endogeneity by using an external instrument correlated with microfinance access but not directly with poverty outcomes. This methodological refinement strengthens the validity of causal claims and ensures more reliable estimates of microfinance's impact on multidimensional poverty.

Therefore, this research seeks to assess how access to microfinance affects the MPI of female-headed households in Wukro Town, Eastern Tigray. By integrating both economic and non-economic dimensions—such as health, education, and social inclusion, the study contributes to a more nuanced understanding of microfinance's role in post-conflict recovery and women's empowerment. The findings aim to inform evidence-based strategies for sustainable poverty alleviation in fragile contexts.

1.3 Research Questions

1. How does access to microfinance credit affect the multidimensional poverty index (MPI) of female-headed households in Wukro Town?
2. What socio-economic and institutional factors influence female-headed households' access to microfinance services in Wukro Town?
3. How does access to microfinance credit shape the coping strategies, business activities, and adaptive mechanisms of female-headed households in post-conflict Wukro Town?

1.4 Objectives

1.4.1. General Objectives

To assess the impact of access to microfinance credit on multidimensional poverty reduction among female-headed households in Wukro Town, Eastern Tigray, Ethiopia.

1.4.2 Specific Objectives

1. To measure the effect of access to microfinance credit on the multidimensional poverty levels (MPI) of female-headed households.
2. To identify and analyze the socio-economic and institutional factors affecting female-headed households' access to microfinance services.
3. To examine how microfinance credit influences coping strategies, income-generating activities, and adaptive mechanisms among female-headed households in post-conflict Wukro Town.

1.5 Scope and Limitation of the Study

Scope of the Study: This study was conducted in Wukro Town, Eastern Tigray, focusing on female-headed households. It examined the impact of access to microfinance credit on multidimensional poverty (MPI), including income, education, health, and living standards. The research also explored how microfinance influences coping strategies and adaptive mechanisms among these households in the absence of rehabilitation and reconstruction initiatives. Data collection took place from February 1, 2025, to March 30, 2025, providing a snapshot of the current socio-economic conditions.

Limitations of the Study: The study faced challenges related to data reliability and availability. Qualitative findings varied due to subjective interpretations. While the focus on female-headed households provided valuable insights, it does not fully represent the experiences of other demographic groups. Additionally, broader economic factors, government policies, and regional infrastructure limitations that could impact microfinance effectiveness were not fully addressed.

1.6 Significance of the Study

This study is significant because it fills a critical gap in the existing literature on the socio-economic effects of microfinance on female-headed households, particularly in post-conflict settings like Wukro Town, Eastern Tigray. By focusing on female-headed households, who often face limited access to resources, decision-making power, and financial services, the research provides valuable insights into how access to microfinance credit can reduce multidimensional poverty, as measured by the multidimensional poverty index (MPI).

The study contributes to both theory and practice. Theoretically, it expands understanding of the relationship between microfinance access and multidimensional poverty, highlighting the importance of economic, educational, health, and social dimensions. Practically, the findings inform policymakers, microfinance institutions, and development agencies about the specific factors that influence women's access to credit, and the ways in which microfinance can improve income, savings, investment opportunities, and household decision-making.

Additionally, by exploring coping strategies and adaptive mechanisms employed by female-headed households in the absence of rehabilitation and reconstruction initiatives, the study highlights how microfinance can strengthen resilience and enhance social inclusion in post-conflict contexts. Overall, this research provides a comprehensive framework for designing more effective microfinance programs aimed at sustainably reducing poverty and empowering women in vulnerable communities.

UNIT TWO

2. LITERATURE REVIEW

2.1 Definitions of Microfinance Institutions (MFI) and Microfinance Development Policy Initiative (MDPI)

Microfinance Institutions (MFIs) are financial institutions that provide small loans, savings, and other financial services to low-income populations, particularly those who do not have access to traditional banking services due to lack of collateral, formal credit histories, or other barriers (Yunus, 2007). MFIs have emerged as crucial actors in poverty alleviation strategies in developing countries, where access to financial resources is limited. The central goal of microfinance is to empower low-income individuals and marginalized groups, such as women, by providing them with financial means to engage in income-generating activities, improve their living conditions, and enhance their social status (Kabeer, 2015). The role of MFIs in poverty alleviation has garnered significant academic interest over the past two decades. Numerous studies have explored the multidimensional impact of MFIs on enhancing the economic security and social mobility of marginalized populations. Among the prominent contributions to this discourse are the works of (Hankamo,2018), (Iqbal,2015), (Alamirew,2007), (Luan,2015), and (Arun,2006), each offering unique insights into the mechanisms through which microfinance can affect poverty levels. MFIs have become a central tool for addressing poverty by providing low-income individuals, especially women, with the financial means to generate income, improve their living conditions, and enhance their social status (Kabeer, 2015).

In the context of Ethiopia, MDPI was established to increase the outreach and impact of microfinance services, focusing on rural and urban poor populations (Gebremichael and Rani, 2012). The MDPI aims to promote financial inclusion, alleviate poverty, and create economic opportunities through the support of MFIs. It seeks to extend credit facilities to those excluded from formal financial systems, particularly women, who face greater barriers to financial access due to cultural and socio-economic factors (Teferi, 2011). Moreover (Alamirew Alemu,2007) offers a comprehensive analysis of microfinance and its relationship with poverty reduction in Ethiopia, which complements the findings of (Gebremichael and Rani,2012). Additionally (FDRE,2020) presents an overview of the current state of MFIs in Ethiopia and discusses prospects for expanding microfinance services, providing important context to the policy framework.

2.2 Theoretical Framework of MFIs and Their Connection to Poverty Reduction

The theoretical foundation of microfinance is built on the idea that access to financial resources can significantly empower individuals and communities. In particular, microfinance is seen as a tool for poverty reduction, with a focus on its potential to enhance economic independence and social mobility (Yunus, 2007). The microfinance theory posits that providing credit to poor individuals, especially women, enables them to start or expand businesses, generate income, and improve their quality of life. Additionally, microfinance is thought to contribute to the broader goals of social development, such as promoting gender equality and enhancing decision-making power within households (Kabeer, 2015).

Moreover, microfinance contributes to alleviating multidimensional poverty by facilitating access to education, health, and nutrition. Poverty is no longer defined solely by income, but also in terms of access to education, health care, nutrition, and social inclusion (Sen, 1999). Microfinance, by offering financial resources, can help improve these dimensions by enabling households to invest in education, health, and other services that contribute to well-being (Alkire, 2015).

(Appah, John, and Wisdom, 2012) add that microfinance programs in Africa have had varying success in terms of poverty alleviation, often dependent on the institutional environment and the ability to address specific barriers faced by women. (Garikipati *et al.*, 2017) also emphasize that microfinance's impact on gender empowerment is closely linked to the broader institutional context and cultural factors that influence women's access to and control over financial resources. (Boehe and Cruz, 2013) further explore how institutional factors such as the legal framework, societal attitudes toward gender, and the governance structures of MFIs play a role in shaping their effectiveness in empowering women.

The Global Findex Database (Demirgüç-Kunt *et al.*, 2020) emphasizes the critical role of financial inclusion, showing that access to financial services significantly contributes to poverty reduction. It also highlights the growing impact of MFI in extending financial services to underserved regions, consistent with the goals of Ethiopia's MDPI. However, microfinance alone may not achieve long-term poverty alleviation unless combined with social and psychological support to address the trauma or displacement experienced by women in conflict-affected areas (Moser, 2007; De Mel, 2015). By providing loans, savings opportunities, and financial education, MFIs empower marginalized communities and help reduce poverty (Armendáriz and Morduch, 2010).

In conflict-affected regions such as Tigray, where social and economic structures have been disrupted, microfinance programs' effectiveness is often influenced by social, cultural, and institutional factors (Appah, John, and Wisdom, 2012; Garikipati *et al.*, 2017; Boehe and Cruz, 2013). Evidence from the literature suggests that while microfinance access can support poverty alleviation, complementary social and psychological interventions are often required to address the full spectrum of poverty and well-being in conflict-affected contexts.

2.3 Empirical Research on MFIs, Poverty, and Food Security

Empirical studies on microfinance and poverty alleviation in Africa, particularly Ethiopia, indicate generally positive outcomes, though results are mixed. Microfinance has been shown to improve household income, savings, and business opportunities. For instance, Teferi, 2011, found that microfinance contributed to poverty reduction by enabling low-income households to engage in income-generating activities. Similarly (Gebremichael and Rani, 2012) demonstrated the positive impact of Ethiopian MFIs on financial inclusion and poverty reduction using the Malmquist Productivity Index (MPI).

Microfinance programs also influence broader socio-economic outcomes. Studies in Ethiopia (Boateng *et al.*, 2015; Teferi, 2011) and in countries such as Bangladesh and Vietnam (Islam, 2021; Luan, 2015) show improvements in household livelihoods, food security, and women's empowerment. However, (Banerjee *et al.*, 2018) caution that income gains do not always translate into better nutrition, health, or social inclusion, highlighting the limitations of focusing solely on economic indicators.

Research emphasizes that microfinance's effectiveness depends on institutional, cultural, and societal factors. For example (Appah, John, and Wisdom, 2012), (Garikipati *et al.*, 2017), and (Boehe and Cruz, 2013) underline the importance of legal frameworks, governance, and gender norms in shaping program outcomes. In conflict-affected regions, microfinance may stabilize household income but often fails to address psychosocial challenges, social exclusion, and gender-based barriers (Banerjee *et al.*, 2018).

A critical gap in literature is the narrow focus on economic poverty, often overlooking multidimensional aspects such as education, health, nutrition, and social inclusion ((Alkire, 2015; Sen, 1999)). Many studies have highlighted improvements in income and livelihoods, but the broader dimensions of poverty remain underexplored, especially in fragile and post-conflict settings like Tigray (Luan, 2015).

In summary, empirical evidence confirms that microfinance can support income generation, livelihood diversification, food security, and women's empowerment. However, sustainable poverty reduction requires integrated approaches that combine financial services with social and psychosocial support, particularly in conflict-affected regions.

2.4 Identified Research Gaps and Theoretical Framework

Although a growing body of research has examined the relationship between microfinance and poverty alleviation, significant gaps remain—particularly concerning its multidimensional impacts and its function in post-conflict settings, such as Tigray, Ethiopia. Most existing studies have focused narrowly on economic indicators—income, savings, and business growth—while overlooking non-economic aspects such as health, education, social inclusion, and psychosocial well-being (Sen, 1999; Alkire, 2015; Kintamo, 2018; Luan, 2015). This has limited understanding of how microfinance affects overall human capability and well-being.

Empirical studies from Ethiopia and other developing countries (Teferi, 2011; Gebremichael and Rani, 2012; Boateng *et al.*, 2015; Luan, 2015) generally report that microfinance improves income and consumption. However, they seldom assess how these financial gains translate into progress in education, health, or social participation key dimensions of multidimensional poverty. Similarly, research in conflict-affected contexts such as Bangladesh and Afghanistan (Banerjee *et al.*, 2018) indicates that while microfinance can stabilize household income, it often fails to address psychosocial challenges, including trauma, displacement, and weakened community networks. These findings suggest the need for more comprehensive analyses that incorporate social and psychological dimensions of poverty.

Methodologically, many previous studies have relied on Propensity Score Matching (PSM) or other quasi-experimental approaches. While these methods control observable differences between participants and non-participants, they cannot adequately address endogeneity, resulting from unobserved factors such as entrepreneurial motivation, social capital, or risk preferences (Kintamo, 2018). Such unobserved heterogeneity may bias estimates of microfinance's true impact. To overcome this limitation, recent studies advocate the use of instrumental variable (IV) or two-stage least squares (2SLS) approaches, which can provide more robust causal inferences (Staiger and Stock, 1997; Gujarati, 2004).

Furthermore, literature on microfinance in post-conflict regions remains scarce. Existing studies seldom consider how war-related trauma, loss of assets, and weakened social institutions

influence both access to and the effectiveness of microfinance services. Female-headed households—often the most vulnerable group in these contexts—are especially underrepresented in the empirical literature (Moser, 2007; De Mel, 2015; Garikipati *et al.*, 2017). Understanding how microfinance affects their multidimensional poverty in the aftermath of conflict therefore represents a critical research need.

To address these theoretical and empirical gaps, this study integrates (Sen's, 1999) Capability Approach—which emphasizes expanding people's freedoms and choices—with (Kabeer's, 2015) Empowerment Framework, which highlights women's agency and control over resources. Together, these frameworks provide a lens for examining how access to microfinance can enhance economic, social, and psychological capabilities. Building on these theoretical foundations, the study employs a mixed-method approach and an instrumental variable (IV) econometric model to generate rigorous evidence on how microfinance access influences the MPI among female-headed households in post-conflict Tigray.

2.5 Conceptual Framework

This study conceptualizes the relationship between access to microfinance credit and the reduction of multidimensional poverty among female-headed households in Wukro Town. Microfinance is viewed as a tool for economic and social empowerment, influencing key dimensions of poverty measured by the MPI.

Access to microfinance credit, including microloans, savings, and related services, serves as the independent variable, shaped by factors such as social inclusion, awareness, collateral requirements, and socio-economic conditions.

Multidimensional Poverty (MPI) the dependent variable is assessed across education, health, and living standards, capturing household deprivations in schooling, healthcare, nutrition, water, sanitation, and assets.

Mediating and Moderating Factors such as women's empowerment, decision-making autonomy, coping strategies, and socio-economic barriers (e.g., conflict, displacement, social norms) influence how microfinance impacts poverty reduction.

Overall, the framework posits that effective access to microfinance enhances income-generating activities, utilization of education and health services, and household living standards, thereby contributing to the reduction of multidimensional poverty.

UNIT THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Wukro Town, one of the thirty municipal towns administered by a mayor under the Tigray Regional State, Northern Ethiopia. Geographically, Wukro is situated approximately 45 kilometers north of Mekelle, the regional capital. The town lies between 13°34'0" and 13°56'45" N latitude, and 39°20'15" and 39°42'45" E longitude, with an average elevation of 2,105 meters above sea level. It covers a total area of about 100,228 hectares (BoARD, 2008).

Administratively, Wukro is composed of three urban kebeles subdivided into twelve zones (sub-Kebeles). The town serves as an important economic and cultural center in Eastern Tigray, known for its tourism potential—notably the rock-hewn churches of Wukro Cherkos, Abraha we Atsbeha, and Dä'äba—which attract both domestic and international visitors.

According to the Central Statistical Agency (CSA) of Ethiopia (2023), the projected population of Wukro Town was 67,069 as of July 1, 2023. This represents a substantial increase from the 2007 census figure of 30,210, reflecting both natural population growth and internal migration driven by post-conflict resettlement and urban economic activities.

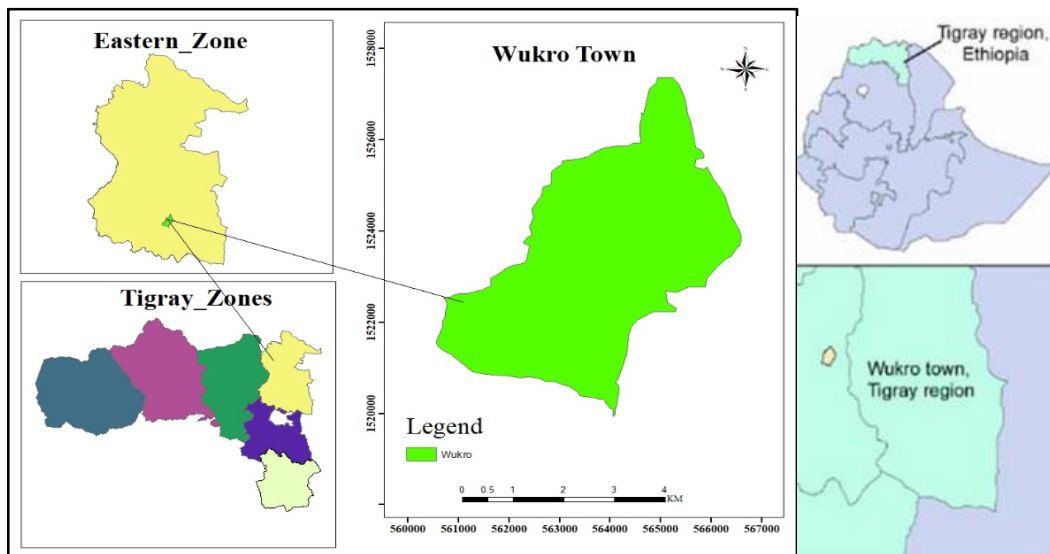


Figure 1: Map of the study area,

3.2. Research Design and Approach

This study employed a cross-sectional explanatory research design using a mixed-method approach, integrating both quantitative and qualitative data. The design was chosen to examine the causal impact of access to microfinance credit on multidimensional poverty among female-headed households in Wukro Town, while also capturing the lived experiences of participants in a post-conflict setting.

The quantitative component used a household survey administered to 392 sampled households. The data collected were analyzed using descriptive statistics and econometric models. Specifically, a logistic regression model was used to identify the factors determining access to microfinance credit, while an Instrumental Variables (IV) and Two-Stage Least Squares (2SLS) approach was employed to estimate the causal effect of microfinance access on the MPI. The IV/2SLS method was selected to address potential endogeneity issues, such as unobserved household characteristics or reverse causality, which may bias ordinary least squares (OLS) estimates.

The qualitative component included in-depth interviews and focus group discussions with selected participants. This provided contextual insights into how microfinance influences coping strategies, empowerment, and adaptation mechanisms among female-headed households.

The integration of both methods allowed for triangulation, enhancing the validity and depth of findings. The mixed-method approach was particularly appropriate in a post-conflict environment like Wukro, where both statistical evidence and personal narratives are essential to understanding multidimensional poverty.

3.3 Population and Sampling Procedure

The study population comprised all female-headed households residing in Wukro Town, Eastern Tigray Region. Administratively, the town is divided into three Tabias, twelve sub-Tabias (zones), and seventy-two blocks (12×6), forming the framework for sampling and data collection. A mixed sampling approach was employed.

Stage 1: Selection of the study site

Wukro Town was purposively selected due to its representativeness and the researcher's familiarity with the community, which facilitated data collection under financial and logistical constraints.

Stage 2: Stratification of the population

The target households were stratified into two groups: Microfinance beneficiaries (2,451 households) non-beneficiaries (5,721 households). The sampling frame was obtained from the MFIs operating in Wukro and the Wukro Town Women and Social Affairs Office.

Stage 3: Sample selection

The sample size was determined using the single population proportion formula.

$$n = \frac{\left(Z_{\alpha/2}\right)^2 (pq)}{\varepsilon^2}$$

At a 95% confidence level ($Z = 1.96$). After including a 2% allowance for non-response, the final sample comprised 392 households. Households were randomly selected from each stratum in proportion to their presence across the twelve sub-Tabias (zones). Accordingly, 118 beneficiary (treated) households and 274 non-beneficiary (control) households were included in the final survey. This stratified random sampling method ensured proportional representation of both beneficiary and non-beneficiary groups, thereby enhancing the reliability and validity of the results.

3.4. Data Collection Methods and Analysis

1. Quantitative Surveys: Structured questionnaires were used to collect data on income levels, savings, expenditures, and overall economic well-being. The data were analyzed using statistical software (STATA) to identify trends and correlations.
2. Qualitative Interviews: In-depth interviews were conducted with a subset of participants to explore personal experiences with microfinance and their impact on their lives. The data were thematically analyzed to extract key insights and narratives."

3.5 Model Selection and Specification

To estimate the causal impact of access to microfinance on the MPI among female-headed households in Wukro Town, an instrumental variable (IV) approach using two stage least squares (2SLS) is employed. This approach addresses potential endogeneity arising from omitted variables, measurement error, or reverse causality, which may bias ordinary least squares (OLS) estimates. Endogeneity is likely in this context because household decisions to participate in microfinance programs may be influenced by unobserved characteristics such as entrepreneurial motivation, financial literacy, or social networks.

3.5.1 First Stage (Predicting Microfinance Access)

$$MF_i = \alpha + \pi_1 Z_i + \pi_2 X_i + u_i$$

Where:

MF_i - Access to Microfinance credit i is a binary variable indicating whether the household has access to microfinance (1 for access, 0 for no access).

Z_i instrument (neighborhood microfinance access) represents the microfinance access status of the household's neighbors (e.g., the proportion of neighbors with access to microfinance).

X_i - includes other control variables (e.g., income, education).

u_i -is the error term.

π_1 -the parameter which captures the relevance of the instrument. The first stage generates the predicted values for access to microfinance credit, which is then used in the second stage.

3.5.2 Second stage estimation

$$MPI_i = \alpha_0 + \beta_1 \widehat{MF}_i + \gamma_1 X_i + \varepsilon_i$$

Where:

MPI_i is the multidimensional poverty index of household i .

$\widehat{MF}_i$ is the instrumented (predicted) microfinance access from the first stage indicating whether household i has access to microfinance.

X_i is a vector of household-level control variables (e.g., age, education, household size).

ε_i is the error term.

The coefficient β_1 measures the causal impact of microfinance on MPI. Since microfinance access may be endogenous, the study employs an instrumental variable Z_i to extract exogenous variation in participation. The chosen instrument neighborhood access to microfinance affects a household's likelihood of obtaining microfinance but is assumed to influence MPI solely through its effect on the household's own microfinance participation.

➤ **Neighborhood Proximity as an Instrumental Variable**

This study employs neighborhood proximity as an instrumental variable (IV) to address potential endogeneity between access to microfinance credit and multidimensional poverty (MPI) among female-headed households in Wukro Town. The central idea is that households living close to one another (within a 200-meter radius) are more likely to share information about financial opportunities, observe peers' borrowing experiences, and develop mutual trust toward MFIs.

➤ **Relevance of the Instrument**

Neighborhood proximity is expected to be strongly correlated with access to microfinance. Households in close geographic clusters frequently exchange information through day-to-day interactions and community gatherings. In the Wukro context, this diffusion of information is reinforced by local social institutions, particularly *Idir* and *Mesatitiy Tsebel*.

Although these communities and spiritual groups do not provide financial services themselves, they function as trusted social networks that facilitate the exchange of knowledge about available credit programs and encourage collective participation. This mechanism strengthens the relevance of neighborhood proximity, as it increases the likelihood that physically close households—who also share communal affiliations—gain awareness of and access to microfinance opportunities.

➤ **Exogeneity and Justification**

To satisfy the exogeneity condition, neighborhood proximity must not directly influence multidimensional poverty except through its effect on microfinance access. While community networks like *Idir* and *Mesatitiy Tsebel* promote solidarity and limited informal support, these effects do not directly alter key MPI indicators such as education, health, or living standards. Instead, their role is primarily informational and relational—facilitating communication and trust that enable participation in microfinance activities. Therefore, neighborhood proximity, reinforced by these community structures, affects MPI only indirectly through access to microfinance credit, fulfilling the exclusion restriction.

➤ **Addressing Potential Concerns**

A potential concern is that socially cohesive neighborhoods might improve welfare directly through non-financial cooperation. This study mitigates that risk by defining proximity strictly in spatial terms (200-meter radius); Controlling for socio-economic variables (education, income,

household size, and social participation); and Treating community group membership (*Idir, Mesatitiy Tsebel*) as information-sharing mechanisms, not direct poverty-alleviating agents. With these considerations, neighborhood proximity remains a valid and contextually grounded instrument that satisfies both IV conditions: Relevance through information diffusion and network exposure to MFIs; Exogeneity is not a direct causal pathway to poverty reduction apart from its effect via microfinance access.

➤ **Multidimensional Poverty Index (MPI)**

The multidimensional poverty index (MPI), developed by the Oxford Poverty and Human Development Initiative (OPHI) and the United Nations Development Programmed (UNDP), is used in this study as the dependent variable to measure poverty beyond income. The MPI captures deprivations in multiple dimensions education, health, and living standards, providing a more comprehensive understanding of poverty than conventional income-based measures (Alkire and Santos, 2010; Alkire *et al.*, 2024).

The MPI is computed as: $MPI = H * A$

Where:

H (Headcount Ratio) is the proportion of households that are multidimensionally poor (i.e., deprived in at least one third of the weighted indicators).

A (Intensity of Poverty) is the average proportion of deprivations experienced by multidimensionally poor households.

The MPI combines **three dimensions** and **ten indicators**, each weighed equally across dimensions, as shown below. However, not all indicators apply to every household (for example, school attendance applies only to households with school-aged children).

Table 3. 1. The weight assigned to the key indicators in the MPI

Dimension	Indicator	Deprivation Cutoff	Weight
Education (1/3)	Years of schooling	No household member has completed at least six years of schooling	1/6
	School attendance	Any school-aged child is not attending school	1/6
Health (1/3)	Child mortality	Any child under five has died in the household	1/6
	Nutrition	Any adult or child is malnourished*	1/6
Living Standards (1/3)	Electricity	Household has no access to electricity	1/18
	Sanitation	Household has unimproved or shared sanitation facilities	1/18
	Drinking water	Household has no access to safe drinking water	1/18
	Flooring	The household floor is made of dirt, sand, or dung	1/18
	Cooking fuel	Household uses unclean cooking fuel (e.g., firewood, dung)	1/18
	Assets	Household does not own more than one of: radio, TV, phone, bike, motorbikes, or refrigerator	1/18

The weight assigned to the key indicators in the MPI, across its three main dimensions, is outlined by (Alkire *et al.*, 2024)

In this study, the nutrition indicator displayed no variation (i.e., its value was uniformly zero). Therefore, it was excluded from the final MPI computation to avoid bias and preserve meaningful variation across households.

Each household's deprivation score is calculated as the weighted sum of deprivations across all indicators. A household is identified as multidimensionally poor if its total deprivation score is ≥ 0.33 (i.e., deprived in at least one third of the weighted indicators).

This approach aligns with the global MPI methodology proposed by (Alkire and Santos, 2010) and updated by (Alkire *et al.*, 2024), while adapting indicator availability to local data constraints. The resulting MPI score serves as the dependent variable in the econometric analysis to assess the effect of access to microfinance credit on poverty reduction among female-headed households in Wukro Town.

3.6. Qualitative Methods

In addition to the quantitative analysis, this study incorporates qualitative methods, including interviews and focus group discussions, to explore the coping mechanisms and adaptive strategies employed by female-headed households. These qualitative insights will help better understand how households adapt to economic challenges, especially in the absence of rehabilitation and reconstruction initiatives.

UNIT FOUR

4. DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

This chapter presents the findings of the study, examining the impact of access to microfinance credit on multidimensional poverty among female-headed households in Wukro Town, Tigray Region. The chapter follows the study's objectives: (1) to assess the effect of access to microfinance credit on household poverty, measured by the multidimensional poverty index (MPI); (2) to identify determinants influencing access to microfinance services; and (3) to explore the coping strategies and adaptive responses adopted by female-headed households, particularly in the context of limited post-conflict rehabilitation efforts and the role of microfinance in shaping these responses.

A total of 392 female-headed households were selected using a stratified random sampling approach, with proportional allocation across three Tabias in the study area. Of these, 118 households had access to microfinance credit (treatment group), while 274 households did not (control group), allowing for a comparative analysis of microfinance's impact on poverty and coping mechanisms.

Quantitative data were collected through structured questionnaires covering household income, education, health, living standards, and socio-demographic characteristics. This approach captured multiple dimensions of poverty as measured by the MPI. To complement the quantitative data, qualitative interviews were conducted to provide contextual insights and personal experiences, enriching the analysis.

Data analysis was performed using STATA. To address potential endogeneity—where factors influencing microfinance access, such as household income, social networks, or unobserved characteristics, may also affect poverty outcomes—the study employed an Instrumental Variables (IV) approach using neighborhood proximity as the primary instrument. Community groups such as *Idir* and *Mesatitiy Tsebel* were additionally considered to strengthen the instrument where relevant. This IV approach ensured a more reliable estimation of the causal effect of microfinance on multidimensional poverty, avoiding biases associated with Ordinary Least Squares (OLS) regression.

The chapter is structured as follows: it begins with a description of the socio-demographic characteristics of the respondents, followed by an analysis of household income and expenditure patterns, access to education and healthcare, and nutrition-related outcomes. The chapter concludes with a discussion of coping strategies and adaptive responses adopted by female-headed households in the absence of sufficient rehabilitation support.

4.2 Descriptive Statistics and Characteristics of Respondents

The descriptive statistics provide an overview of the socio-economic and demographic characteristics of female-headed households in Wukro Town. This section presents summary information on variables relevant to the study, including age, marital status, education level, household size, income, livelihood activities, and multidimensional poverty status.

These statistics describe the sample and highlight initial differences between households with and without access to microfinance credit, offering preliminary insights before moving to the econometric (2SLS) analysis in the next section.

4.2.1 Age distribution of female household heads

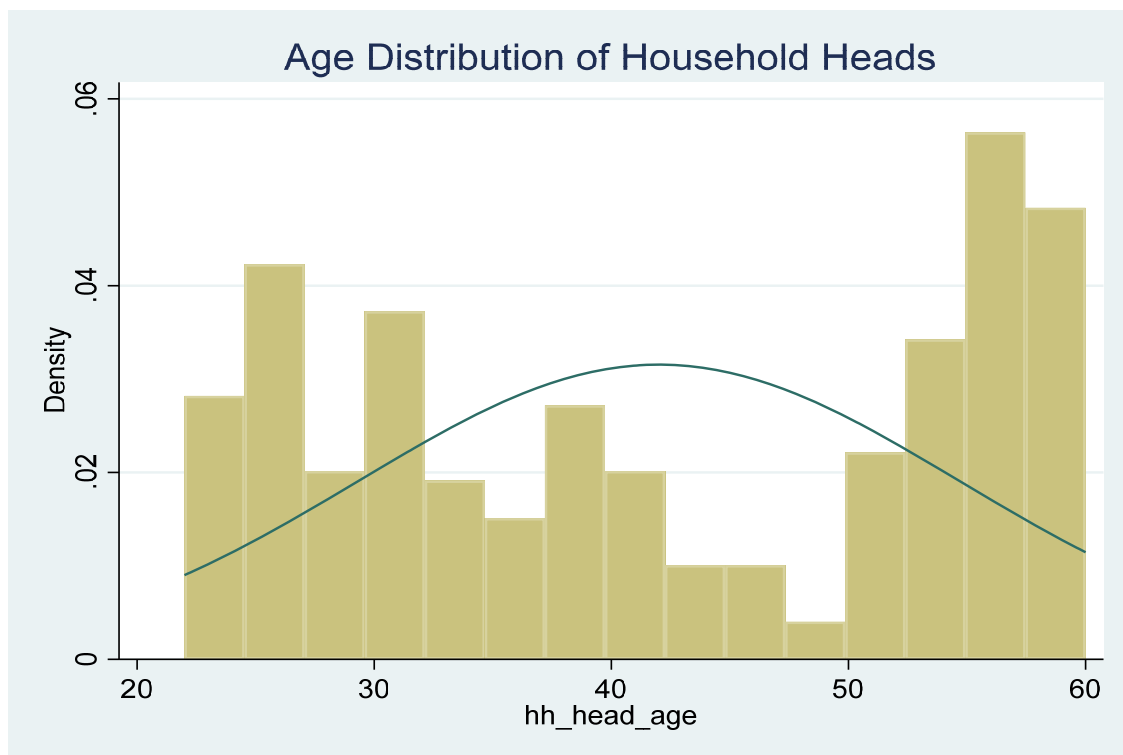


Figure 4. 1. Age Distribution of Female Household Heads

Source: Own Computation

Table 4. 1. Frequency Age Distribution of Households

Age Group	Age Range	Freq.	Percent (%)
1	20–29	99	25.26%
2	30–39	110	28.06%
3	40–49	72	18.37%
4	50–60	111	28.31%
Total	20.-60	392	100.00%

Source: Own computation

The age of female-headed households in Wukro Town ranged from 20 to 60 years. The largest proportion of household heads were aged 30–39 years (28%), followed closely by those aged 50–60 years (28%). Household heads aged 20–29 years accounted for 25%, while the smallest group was 40–49 years, comprising 18% of respondents. Overall, the age distribution shows a mix of young, middle-aged, and older adult household heads.

4.2.2 Marital status

Table 4. 2. Frequency distribution of marital status

Marital Status	Frequency	Percent	Cumulative %
Separated	49	12.50%	12.50%
Single	23	5.87%	18.37%
Married	82	20.92%	39.29%
Widowed	162	41.33%	80.61%
Divorced	76	19.39%	100.00%
Total	392	100.00%	

Source: Own computation

Among the respondents, the largest group was widowed, representing 41.3% of the sample. Married households accounted for 20.9%, while divorced households made up 19.4%. Separated and single respondents represented 12.5% and 5.9%, respectively. This indicates that a significant proportion of female-headed households in the sample are widowed.

4.2.3 Educational status of female household heads

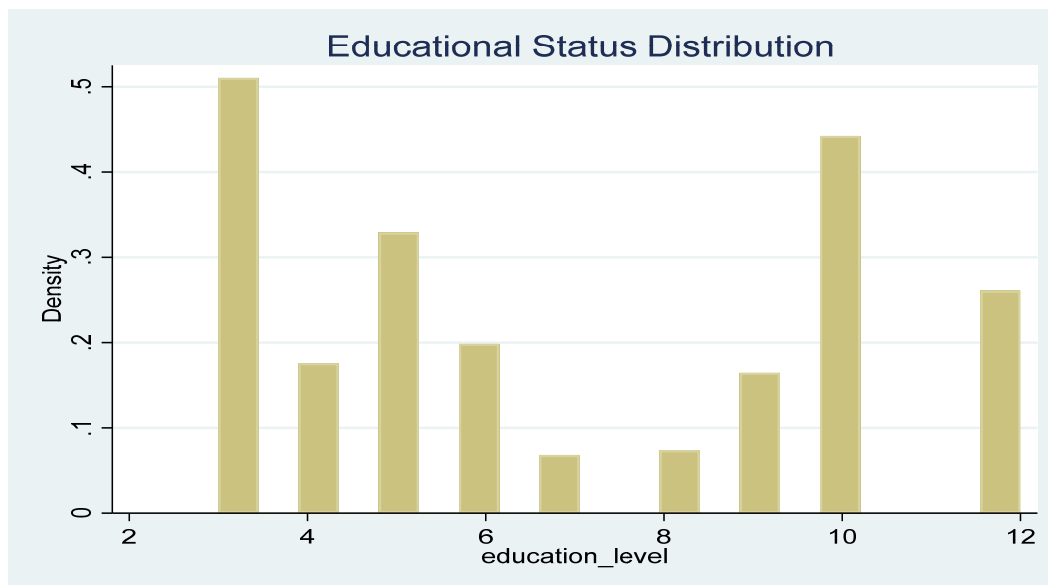


Figure 4. 2. Education status of female household heads

Source: Own Computation

Table 4. 3. Frequency distribution of cross-tabulation education and microfinance:

Education level	Microfinance access		Total
	Yes	No	
3	90	0	90
4	31	0	31
5	57	1	58
6	35	0	35
7	12	0	12
8	12	1	13
9	1	28	29
10	23	55	78
12	13	33	46
Total	274	118	392

Source: Own computation

The education levels of female-headed households in my sample ranged from grade 3 to grade 12, with no respondents having post-secondary education. Most respondents were concentrated in the secondary education levels (grades 9–12).

When examining the relationship between education levels and microfinance access, I found that higher education levels were generally associated with greater participation in microfinance programs. For example, the majority of respondents with grades 9–12 education accessed

microfinance services, whereas access was very limited among those with lower education levels. These results indicate an association between education and microfinance participation but do not imply causation.

4.2.4 Income Levels

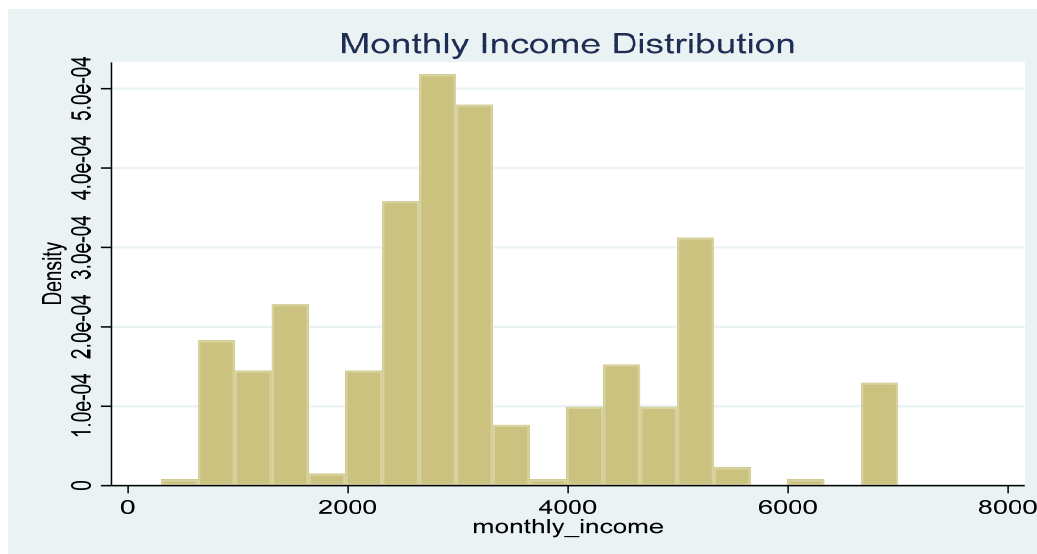


Figure 4. 3. Monthly income distribution of female household heads

Source: Own computation

Table 4.3: Frequency distribution of monthly income with and without access to microfinance

Mean estimation	Number of observations=392		
Microfinance access	Mean	Standard. error	(95% confidence. Interval)
No	2343.047	47.30633	2250.041-2436.054
Yes	4968.729	91.54963	4788.738-5148.72

Source: Own computation

The monthly income of female-headed households in Wukro Town shows substantial differences based on access to microfinance. Households without access to microfinance have a mean monthly income of 2,343.05 ETB (95% CI: 2,250.04 – 2,436.05 ETB), whereas households with access to microfinance have a mean income of 4,968.73 ETB (95% CI: 4,788.74 – 5,148.72 ETB). This nearly twofold difference suggests a strong association between access to microfinance and higher household incomes.

Table 4. 4. Frequency distribution of main sources of income

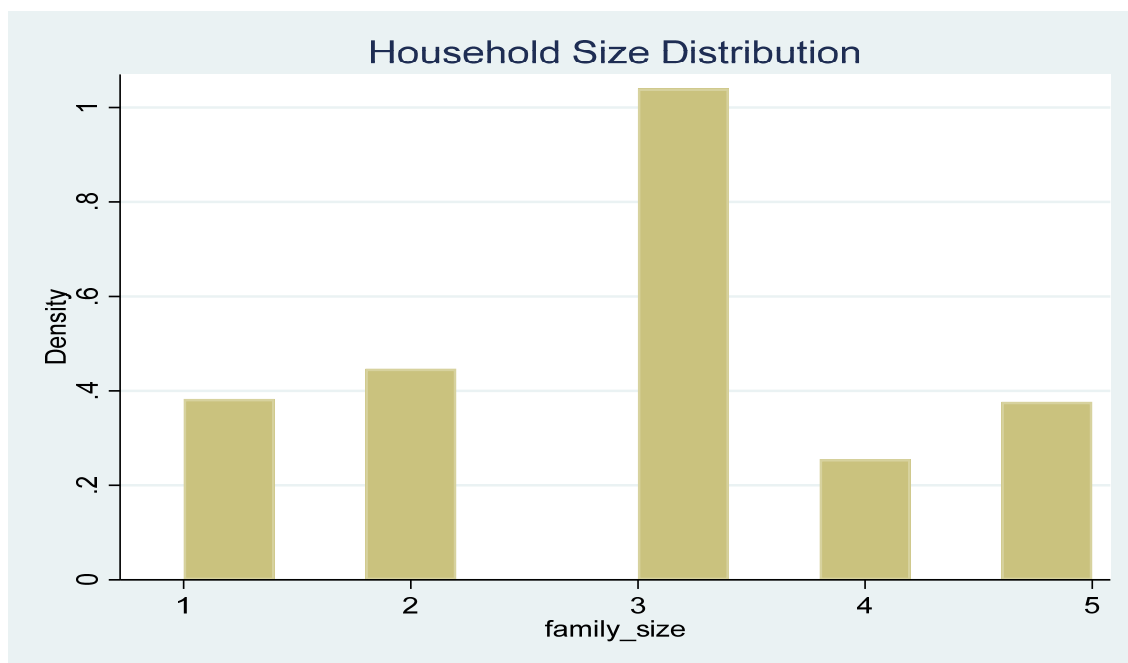
Main income source	Freq.	Percent	Cum.
Urban Agriculture	81	20.66	20.66
Drink Prep	138	35.20	55.87
Retail	144	36.73	92.60
Other	29	7.4	100
Total	392	100.00	

Source: Own computation

The primary sources of income for female-headed households are dominated by retail trade (36.73%) and drink preparation (35.20%), together accounting for over 70% of households. Urban agriculture contributes 20.66%, while other sources constitute 7.41%. This indicates that small-scale trade and service activities are the predominant livelihood strategies among the sample, with fewer households engaged in agriculture or diversified income sources.

4.2.5 Household size

Figure 4. 4. Household size distribution of female household heads



Source: Own Computation

Table 4. 5. Frequency distribution of family size

household size	Frequency	Percent	Cumulative %
1	61	15.56%	15.56%
2	70	17.86%	33.42%
3	164	41.84%	75.26%
4	39	9.95%	85.20%
5	58	14.80%	100.00%
Total	392	100%	

Source: Own computation

The distribution of household sizes among female-headed households in Wukro Town shows that the majority of households are small to medium-sized. Households with three members are the most common, representing 41.84% of the sample. Nearly three quarters (75.26%) of households have between one and three members. Larger households with four or five members account for only 24.75% of the sample.

Overall, the data show a right-skewed distribution with a concentration of smaller households, which may reflect urban living conditions, economic constraints, or changing social structures in the region.

4.2.6 Multidimensional poverty status of treated and controlled households

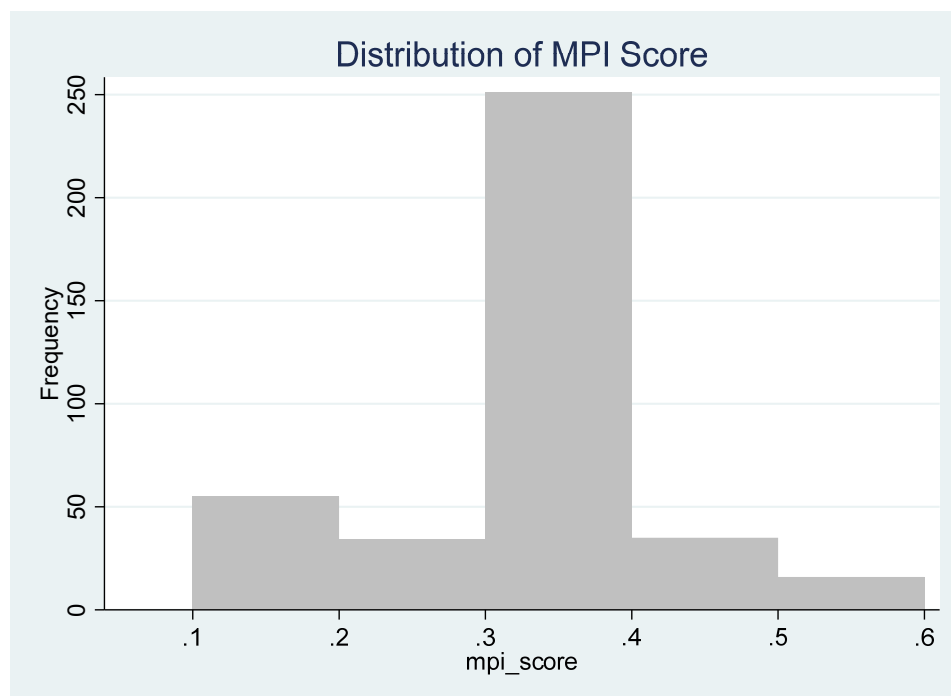


Figure 4. 5. Distribution of MPI score distribution

Table 4. 6. Sum of weight of deprived indicators (W) with MPI status.

Sum of Weights of Deprived Indicators (W)	Multidimensional Poverty Status
$W < 0.20$	Not Poor
$0.20 \leq W < 0.33$	Vulnerable
$0.33 \leq W < 0.50$	poor
$W \geq 0.50$	Severe

Source: United Nations Development Program (2022)

A household is considered poor if they are deprived in at least one third of the weighted indicators. In other words, a household is identified as poor if it has a deprivation score greater than or equal to one third (33 percent) (Alkire and Santos, 2013). Following this the researcher uses 0.33 cut-off points for the study.

Table 4. 7. Number of households with and without microfinance access to credit with sum of weight of deprived indicators (W) with MPI status

Multidimensional poverty status.	Number of households with and without microfinance access to credit			Percent	Cumulative percent
	Without access	With access	Total		
Not Poor	1	54	55	14%	14%
Vulnerable	14	34	48	12.2%	26.3%
Poor	242	30	272	69.4%	95.7%
Severe	16	0	16	4.2%	100%
Total	274	118	392	100%	

Source: Own computation

Table 4. 8. Number of deprived households in each indicator

Dimension	Indicator	Criterion	Without Access (n, %)	With Access (n, %)
Education	Years of Schooling	No household member completed 6 years	225 (57.4%)	2 (1.7%)
Education	School Attendance	Any school-aged child not attending school	241 (61%)	20 (16%)
Health	Nutrition	Any household member under 70 undernourished	0	0
Health	Child Mortality	Child under 18 died in last 5 years	0	0
Living Standards	Cooking Fuel	Household uses solid fuel	268 (68%)	45 (38%)
Living Standards	Sanitation	Unimproved or shared facility	51 (13%)	0
Living Standards	Drinking Water	Unsafe or >30 min round-trip	44 (11%)	0
Living Standards	Electricity	No electricity	1 (0.4%)	0
Living Standards	Housing	Inadequate materials in floor/roof/walls	0	0
Living Standards	Assets	Owns ≤ 1 assets and no vehicle	201 (51%)	0

Source: Own computation

The distribution of multidimensional poverty among female-headed households shows significant differences between those with and without access to microfinance (Figure 11; Tables 4.7 and 4.8). Among households without access, the majority (88.3%) fall into the Poor or Severe categories, while only 0.4% are classified as Not Poor. In contrast, households with microfinance access show higher proportions in the Not Poor (45.76%) and Vulnerable (28.8%) categories, and none are classified as Severely Poor (Table 4.7).

Deprivation levels across MPI dimensions also differ markedly (Table 4.8). In education, 57.4% of households without access lack the minimum years of schooling, and 61% have school-aged children not attending school, compared to only 1.7% and 16% among households with access. In health, no deprivation is reported for either group regarding nutrition or child mortality.

Regarding living standards, households without microfinance access show greater deprivation across most indicators. For example, 68% use solid fuels compared to 38% of households with access, and 13% of non-access households lack adequate sanitation. Deprivation in drinking water and asset ownership occurs only among households without access (Table 4.8).

Overall, these descriptive statistics highlight clear differences in multidimensional poverty outcomes between households with and without microfinance access. Households with access are more concentrated in lower deprivation categories, suggesting that access to microfinance may contribute to improvements in education, living standards, and overall household welfare. These findings align with previous studies on the role of financial inclusion in reducing multidimensional poverty (Teferi, 2011; Boateng *et al.*, 2015).

The descriptive evidence shows clear differences in deprivation patterns between households with and without microfinance access. However, these differences do not necessarily indicate causality. To identify the causal impact of microfinance on multidimensional poverty, the study applies an Instrumental Variables (IV) approach, as presented in the next section.

4.3. Econometric Analysis

Following the descriptive assessment of household characteristics and poverty profiles, this section presents the econometric analysis aimed at identifying the causal relationship between access to microfinance credit and multidimensional poverty among female-headed households in Wukro Town.

Given the likelihood of endogeneity where unobserved factors such as entrepreneurial motivation, financial literacy, or social capital simultaneously influence both microfinance participation and poverty outcomes, the study adopts an instrumental variable (IV) estimation framework implemented through two stages least squares (2SLS).

This approach allows for consistent estimation of the causal effect of microfinance on MPI by isolating exogenous variation in credit access through a valid instrument, namely neighborhood proximity to microfinance users.

The analysis is organized into three parts. Section 4.3.1 presents the first stage results identifying predictors of microfinance access. Section 4.3.2 reports the second stage results estimating the effect on MPI. Finally, Section 4.3.3 discusses diagnostic and robustness tests confirming the validity and reliability of the instrumental variable.

4.3.1 First stage regression results

This is the regression of endogenous variables (microfinance access) on all the instruments and exogenous controls:

Table 4. 9. First stage regression table

Access to microfinance credit	Coefficient	Std. Err	t	P>t
Education level	0.0167	0.0042	-3.92	0.000
Monthly income	0.000132	0.000011	12.28	0.000
Family size	-0.1011	0.0106	-9.50	0.000
Religion	0.0264	0.0184	1.44	0.152
Household head age	-0.0089	0.0011	-8.25	0.000
Neighbors access	0.3712	0.0329	11.29	0.000
_cons	0.5245	0.0727	7.21	0.000

Number of observations = 392. $F(6,384) = 344.69$ very high, and $p < 0.001$ strong joint significance of instruments and controls. $R\text{-squared} = 0.843 \rightarrow 84.3\%$ of the variation in microfinance access is explained by these variables.

The access of neighbors to microfinance is highly significant (coefficient = 0.3712, $p < 0.001$), indicating that it is a strong predictor of households' participation in microfinance programs. The instrument's strong significance, combined with a very high F-statistic, supports its validity, providing reliable variation for predicting microfinance access. The first stage regression highlights the factors affecting households' likelihood of using microfinance services. As shown in Table 4.9, neighbors' access to microfinance—used as the instrumental variable—is highly significant, confirming its strong relevance in predicting participation.

Other factors, including education, monthly income, family size, and age of the household head, are also statistically significant. Higher education and income increase the likelihood of accessing microfinance, whereas larger family size and older age decrease it. The very high F-statistic (344.69, $p < 0.001$) and R^2 value (0.843) indicate a strong model fit in the first stage, further validating the instrument's relevance and reliability.

4.3.2 Second stage regression results

Table 4. 10. Second stage regression result

MPI score	Coefficient	Std. Err	z	P>z
Microfinance access	-0.2591	0.0601	-4.31	0.000
Education level	-0.00027	0.00283	-0.10	0.023
Monthly income	0.0000167	0.0000135	1.24	0.016
Family size	0.00093	0.01022	0.09	0.028
Religion	-0.03848	0.0128	-3.01	0.003
Household head age	-0.00294	0.00104	-2.82	0.005
_cons	0.4205	0.0604	6.97	0.000

Number of observations = 392. Wald $\chi^2(6) = 183.27 \rightarrow$ model is highly significant ($p < 0.001$).
R-squared = 0.25% of the variation in MPI score explained.

The 2SLS results indicate that access to microfinance significantly reduces the multidimensional poverty index (MPI) by 0.259 ($p < 0.001$), demonstrating a strong negative causal effect on multidimensional poverty. Female-headed households with microfinance access experience notably lower poverty levels.

Among the control variables, higher education (coefficient = -0.00027 , $p < 0.05$) and older age of the household head (coefficient = -0.00294 , $p < 0.01$) are associated with lower MPI, suggesting that human capital and experience enhance resilience. Family size (coefficient = 0.00093 , $p < 0.05$) and monthly income (coefficient = 0.0000167 , $p < 0.05$) show small positive effects on MPI, indicating that larger households and certain income dynamics can slightly increase deprivation. Religion (coefficient = -0.03848 , $p < 0.01$) has a modest negative effect, possibly reflecting social cohesion benefits.

The overall Wald χ^2 statistic (183.27 , $p < 0.001$) confirms the model's significance, and the R^2 value (0.251) indicates that about 25% of MPI variation is explained by the included variables. These findings provide strong evidence that microfinance access causally reduces multidimensional poverty among female-headed households, even after accounting for endogeneity.

4.3.3 Diagnostic and Endogeneity Tests

Table 4. 11. Endogeneity tests

Test	Value	p-value	Interpretation
Durbin (score) $\chi^2(1)$	14.4648	0.0001	Reject $H_0 \rightarrow$ microfinance access is endogenous.
Wu-Hausman $F(1,383)$	14.7131	0.0001	Reject $H_0 \rightarrow$ Same conclusion, endogeneity present.

Both endogeneity tests strongly reject the null hypothesis, indicating that microfinance access is endogenous in the MPI model. This means that using ordinary least squares (OLS) would produce biased and inconsistent estimates. The results, summarized in Table 4.11, show that both the Durbin (score) test and the Wu-Hausman F test reject exogeneity at $p < 0.001$.

Because microfinance access may be correlated with unobserved factors affecting poverty, an instrumental variable approach is required. Employing two stage least squares (2SLS) is therefore appropriate, and the previously reported 2SLS coefficient of -0.259 represents a consistent estimate of the causal effect of microfinance access on MPI, confirming that access significantly reduces multidimensional poverty.

4.3.4 Instrument strength and validity

Table 4. 12. Instrument diagnostics

Statistic	Value	Interpretation
Adjusted R-sq	0.8410	Very high $\rightarrow$ instruments and controls explain 84% of the variation in microfinance access.
Partial R-sq	0.2492	The portion of variation in microfinance access is explained only by the excluded instrument (neighbors' access).
F (1,384)	127.48	The first stage F-statistic for the instrument.
Minimum eigenvalue statistic	127.48	Related to the Cragg-Donald statistic for weak instruments.

The first stage F-statistic (127.48) is well above the conventional threshold of 10, confirming that the instrument is very strong (Staiger and Stock, 1997). The partial R^2 of 0.2492 shows that approximately 25% of the variation in microfinance access is explained by the instrument alone,

indicating substantial relevance. Combined with the endogeneity test results, these diagnostics confirm that microfinance access is endogenous, and that the instrument—neighbors' access—is both strong and valid for 2SLS estimation. Consequently, the 2SLS coefficient of -0.259 provides a reliable casual estimate, showing that access to microfinance significantly reduces multidimensional poverty, whereas OLS estimates would have been biased. The theoretical justification and diagnostic evidence support the instrument's validity, as its effect on MPI occurs exclusively through microfinance access, satisfying the exclusion restriction.

4.4 Qualitative Analysis (Thematic Analysis)

This section explores how female-headed households in Wukro Town cope with multidimensional poverty amid limited post-conflict support. Using both quantitative and qualitative data, it examines the role of microfinance and community networks, such as neighbors, *Idir*, and *Mesatitiy* Tsebel. Interviews with 15 households—8 with microfinance access and 7 without—revealed three main themes through thematic analysis: microfinance as empowerment, barriers to access, and coping strategies.

4.4.1 Microfinance as a Path to Empowerment

Households that had access to microfinance adopted strategies that enhanced their resilience and improved living standards. Quantitative analysis indicates that access to microfinance is associated with lower MPI scores (Coefficient = -0.2591 , $p < 0.001$), reflecting reduced deprivations in education, health, and household living conditions.

Key strategies observed include:

Income Diversification: Beneficiaries invested loans in small-scale businesses such as vegetable vending, poultry farming, or local shops, generating additional household income.

Investment in Education and Health: Many women used the loans to cover school fees or obtain medical care, improving these aspects of household well-being.

Improved Decision-Making: Access to microfinance increased women's control over household financial decisions, helping them manage economic challenges more effectively.

Supporting quotes from interviews:

“Before the loan, I was just selling vegetables. With the money, I bought a cart and started supplying nearby towns. Now I can send my children to school without asking anyone for help.”
(Interviewee 3)

“I finally feel like I am doing something of my own. I have a say in household decisions now, especially about money.” (Interviewee 7)

Overall, the findings show that microfinance helps households generate income, improve essential services, and strengthen decision-making capacity.

4.4.2 Barriers to access

Households without access to microfinance primarily relied on informal support and personal resourcefulness, and quantitative analysis showed that these households experienced higher levels of multidimensional poverty.

Key coping strategies observed include:

Community Support: Families depended on local networks such as Idir and Mesatitiy Tsebel for financial assistance, guidance, and emotional support.

Informal Labor and Small Trade: Many engaged in temporary work or small-scale trading to meet daily household needs.

Resource Sharing: Households pooled resources with neighbors to cover emergencies or essential expenses.

Supporting quotes from interviews:

“No one explains it to us. They only talk to people in the center town.” (Interviewee 6)

“Even if I wanted to get a loan, I wouldn’t know what to do. I have no training or plan.” (Interviewee 11)

“When my daughter was sick, Idir members gave me money and came with me to the clinic. That support is what keeps us going.” (Interviewee 10)

These findings indicate that lack of awareness, low literacy, and unfamiliarity with formal procedures limit access to microfinance, forcing many households to depend on traditional community networks.

4.4.3 Coping Strategies and Community Support

Community networks, including neighbors, Idir, and Mesatitiy Tsebel, play a critical role in strengthening households’ ability to cope with multidimensional poverty. These networks help

families access microfinance through information sharing and social support, and they also provide direct assistance during financial or health crises.

Quantitative analysis supports this, showing that households within supportive networks are more likely to obtain credit, which, in turn, reduces MPI scores (Coefficient = 0.3712, $p < 0.001$).

Insights from interviews highlight this role:

“Even with the loan, I still rely on Tsebel and prayer groups. We help each other when business is slow.” (Interviewee 13)

“When my daughter was sick, Idir members gave me money and came with me to the clinic. That support is what keeps us going.” (Interviewee 10)

These findings suggest that while microfinance improves household resilience, combining it with strong community-based support maximizes coping capacity. Access to social networks remains vital for all households, regardless of financial inclusion.

4.4.4 Summary of themes

Table 4. 13. Summary of themes

Theme	Main Ideas
Microfinance as Empowerment	Increased income, independence, confidence, better decision-making
Barriers to Access	Lack of awareness, low literacy, fear of formal procedures
Coping Strategies and Support	Reliance on community networks like Idir, Tsebel, in addition to microfinance

These themes help explain the real-life situation of female-headed households beyond the numbers. While microfinance can bring positive changes, it does not reach everyone, and traditional community networks still play a big role in supporting these women.

4.5 Discussion of Findings

4.5.1 Interpretation of findings

The study demonstrates that microfinance significantly reduces multidimensional poverty among female-headed households in Wukro. IV/2SLS results show a reduction in MPI scores (Coefficient = -0.259 , $p < 0.001$), providing strong causal evidence that microfinance improves household welfare, consistent with prior studies (Gebremichael and Rani, 2012; Luan, 2015).

Qualitative findings reinforce this, showing that women with microfinance access enhanced income, invested in education and health, and gained greater decision-making autonomy. These outcomes align with Sen's Capability Approach (Sen, 1999) and Kabeer's Empowerment Framework (Kabeer, 2015), indicating that economic resources can enhance capabilities and agency, though transformative change also requires social and institutional support.

However, the modest MPI reduction suggests that microfinance alone cannot eliminate multidimensional poverty. Households without access rely on informal networks like Idir, Mesatitiy Tsebel, and neighbors. Barriers such as low literacy, limited awareness, and fear of formal procedures constrain access, highlighting the need for complementary interventions including financial literacy, education, and psychosocial support (Banerjee *et al.*, 2018; Moser, 2007; Appah *et al.*, 2012; Garikipati *et al.*, 2017).

Social networks play a critical role, facilitating access to microfinance and enhancing household resilience, supporting evidence that social capital amplifies the impact of microfinance (Geleta, 2015; Mengstie, 2022).

4.5.2 Comparison with Previous Studies The findings align with existing research:

Income and living Standards: Microfinance contributes to income diversification, education, and health improvements (Teferi, 2011; Boateng *et al.*, 2015).

Women's Empowerment: Access to finance increases autonomy and confidence, though full decision-making power is not guaranteed (Kabeer, 2015; Haileselassie, 2007).

Barriers and limitations: Structural and informational constraints limit access for some households, echoing prior studies (Malela, 2022; Degago, 2021).

Community Networks: Informal social support enhances resilience and maximizes microfinance impact (Moser, 2007; Geleta, 2015).

4.5.3 Theoretical implications

Sen's Capability Approach (Sen, 1999) Microfinance expands capabilities by increasing choice and reducing deprivation.

Kabeer's Empowerment Framework (Kabeer, 2015): Access to finance strengthens agency and decision-making, though social and institutional factors shape outcomes.

Post-conflict Microfinance Literature: Even in fragile contexts, microfinance improves welfare, but its full potential depends on complementary interventions and strong community networks (Gebremichael and Rani, 2012; Luan, 2015).

CHAPTER FIVE

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary of Major Findings

This study examined the impact of access to microfinance credit on multidimensional poverty among female-headed households in Wukro Town, Tigray Region. A total of 392 households were surveyed, comprising 118 with access to microfinance (treatment group) and 274 without (control group). Both quantitative and qualitative methods were used to provide a holistic understanding of the issues.

Key Findings:

Socio-Demographic Profile:

- ✓ Female-headed households with microfinance access were generally younger, better educated, and more likely to be self-employed or formally employed than those without access.
- ✓ Beneficiary households reported higher average monthly incomes (4,968.73 ETB vs 2,343.05 ETB) and smaller household sizes.

Quantitative Results:

- ✓ IV/2SLS regression confirmed a causal relationship: access to microfinance reduced the MPI score by 0.259 points, indicating a significant reduction in multidimensional poverty.

Qualitative Insights:

- ✓ Beneficiaries viewed microfinance as a tool for economic empowerment, enabling them to start or expand small businesses and improve household welfare.
- ✓ Non-beneficiaries reported barriers such as limited awareness, low financial literacy, and a lack of trust.
- ✓ Community networks—including neighbors, Idir, and Mesatitiy Tsebel—were critical in facilitating information flow and supporting financial inclusion.

5.2 Conclusion

The study provides strong evidence that access to microfinance credit significantly reduces multidimensional poverty among female-headed households in Wukro Town. Beneficiary households were economically more active, financially stable, and less deprived across key dimensions, including income, education, health, and living standards.

The study also highlights structural barriers to financial inclusion, such as limited awareness, low literacy, and inadequate support, underscoring the need for integrated interventions that combine microfinance with education, training, and community support networks.

5.3 Recommendations

1. Policy-Level Recommendations:

- **Expand Microfinance Coverage:** Government and NGOs should increase microfinance outreach, especially to the most vulnerable female-headed households.
- **Supportive Infrastructure:** Invest in education, financial literacy programs, and urban infrastructure to complement microfinance interventions.
- **Targeted Subsidies or Guarantees:** Provide interest subsidies or loan guarantees to reduce risk and encourage participation among female-headed households.

2. Institutional-Level Recommendations:

- **Tailor Products for Women:** MFIs should offer gender-sensitive loan products aligned with income cycles and needs of women in informal sectors.
- **Capacity Building:** Include business and financial management training to improve loan utilization and repayment.
- **Leverage Community Networks:** Collaborate with Idir, Mesatitiy Tsebel, and neighborhood groups to disseminate information and build trust.

3. Community-Level Recommendations:

- **Promote Group Lending Models:** Encourage solidarity group lending to reduce risk and enhance accountability among borrowers.

4. Suggestions for Further Research:

- **Conduct longitudinal studies** to better capture the long-term impact of microfinance on poverty dynamics.
- **Explore gender-specific constraints** in post-conflict contexts more deeply.
- **Conduct a cost-benefit analysis** of microfinance operations in urban areas to inform more efficient program design.

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APPENDIX

Introductory Letter

Interviewer Name _____ Woreda's Name: _____

Tabia name: _____ Farmer's ID _____

Hello dear Madam,

My name is Fasil Adane, and I am currently pursuing a Master's degree in Development Policy Analysis at Mekelle University. As part of my academic research, I am conducting a study titled *"The Impact of Microfinance Institutions (MFIs) on Poverty Reduction Among Female-Headed Households in Wukro Town, Eastern Zone, Tigray Region, Ethiopia."*

The objective of this study is to explore how access to microfinance services, such as loans, savings, and insurance, has impacted the economic well-being of female-headed households in your community. By understanding these effects, we aim to evaluate whether microfinance plays a role in improving income levels, living standards, and overall quality of life for women and their families. Participation in this survey is entirely voluntary, and you may choose to withdraw at any time without any negative consequences. Rest assured, all responses will remain confidential and will be used solely for research purposes. Personal identifiers will not be included in the final report, and all data will be securely stored.

This questionnaire will take approximately 30 minutes to complete. Your input is extremely valuable, and your participation will contribute significantly to enhancing our understanding of the role microfinance can play in empowering female-headed households.

If you have any questions or concerns about the survey or the study, you can call at [0914349083].

Thank you for your time and cooperation.

Sincerely,

Fasil Adane

Master's Student in Development Policy Analysis

Mekelle University

0914349083

Questionnaire:

The Impact of Microfinance Institutions (MFIs) on Poverty Reduction Among Female-Headed Households in Wukro Town, Eastern Zone, Tigray Region, Ethiopia.

Section A: Demographic Information

1. Age of the Household Head

age: _____ (years)

2. Religion: a) Christianity c) Catholic b) Islam d) Others _____

3. Educational Attainment of the Household Head
the highest level of education attained: _____

3. Marital Status of the Household Head

☐ Single ☐ Married ☐ Widowed ☐ Divorced ☐ Separated

4. Number of Children or Dependents in Your Household _____

5. Main Source of Income (major type of activities) for Your Household

a) Urban Agricultural activities _____ b) Local drink preparation _____ c) Retail trade
_____ d) Wood or metal work _____ e) Small business (e.g., trade, poultry,
etc.)

f) Remittances

g) Casual labor

h) Other (please specify) _____ How stable do you feel your primary
income source is, and how has microfinance influenced it?-----

Section B: Access to Microfinance

6. Do you currently have access to microfinance services?

☐ Yes ☐ No

7. If you do not have any access to credit, what was the main reason(s):

a) High interest rate _____

b) Collateral requirement _____

c) No information of loans _____

d) Others (specify) _____

8. If yes which microfinance institution(s) do you access services from?

☐ Dedebit ☐ Adeday ☐ Ado ☐ Rohobet ☐ Other (please specify) _____

9. Why did you choose this particular institution, and what has your experience been with it? ----

10. Duration of Membership in the Microfinance Institution(s)

(specify number of months/years of membership) _____

11. Types of Services Accessed from the Microfinance Institution

☐ Savings ☐ Loans ☐ Insurance ☐ Credit facilities ☐ Other (please specify) _____.

12. Loan Amount Received in the Past Year

Please specify the amount of loans received: _____ ETB

13. How would you rate the ease of access to microfinance services?
☐ Very easy ☐ Easy ☐ Neutral ☐ Difficult ☐ Very difficult
14. What challenges have you faced in accessing microfinance services?
a) Lack of collateral
b) Education level
c) Relationship with the institution
d) Economic instability
e) Lack of information/awareness
f) Other (please specify) _____
15. For what purposes did you find the loan? a) Food consumption _____ b) Clothing _____
c) Business activities _____ d) Purchase agricultural inputs _____
e) Medical or health services _____ f) Others (specify) _____
16. Do you keep financial records for your business? Yes, _____ No _____
- If yes, does it help you in your loan repayment? Yes, _____ No _____
17. What do you think the transaction costs of the program relative to formal banks?
Fair _____ Same _____ High _____
18. What is your overall opinion about the program? _____
19. During your participation period, what have been the major constraints in operating your business?
a) Insufficient fund _____
b) Insufficient or lack of land _____
c) Lack of business knowledge _____
d) Lack of market for output _____
e) Lack of knowledge of using the loan _____
f) Loss or damage _____
g) Lack of capital _____
Others (specify) _____
20. Do you think that you will continue in the program? Yes, _____ No _____
- If yes, why?
a) _____
b) _____
c) _____
- If no, why?
a) Too small loan amount _____ b) Too short loan length _____
c) Inappropriate time of loan repayment _____ d) Conflicts with members _____
e) Obtaining enough capital _____ f) Unable to repay the loan _____
g) Decide to close the business _____ h) Others (specify) _____

Section C: Role of Neighbors in Access to Microfinance

21. Do you have neighbors who have access to microfinance services?
☐ Yes ☐ No
22. Have your neighbors shared experiences with microfinance services?
☐ Yes ☐ No ☐ Not sure
23. Have any of your neighbors encouraged you to apply for microfinance services?
☐ Yes ☐ No ☐ Not applicable (I didn't receive encouragement)

24. Did you learn about microfinance services through your neighbors?
☐ Yes ☐ No ☐ Not sure _____
25. Do your neighbors help or support you in any way with accessing or managing microfinance?
☐ Providing information about microfinance services
☐ Assisting with loan application ☐ Offering financial advice
☐ Helping with repayment ☐ Other (please specify) _____
26. How influential do you think your neighbors were in your decision to access microfinance services?
☐ Very influential ☐ Somewhat influential
☐ Not influential ☐ Not applicable (I did not consider neighbors in my decision)
27. Would you say that your neighborhood is supportive of women accessing microfinance?
☐ Yes ☐ No ☐ Somewhat ☐ Not sure

Section D: Impact on Poverty Reduction (Multidimensional Poverty Index - MPI) Income and Expenditure

28. Changes in Household Income Since Accessing Microfinance
 Please specify the (percentage) increase/decrease in household income: _____ %
29. (Please provide the sum of income from all sources in Birr)
 _____ (in Birr)
30. Average monthly expenditure:
 Food: _____ Birr Non-food (e.g., clothing, health, education): _____
 Birr Fixed Assets (e.g., household equipment): _____ Birr
31. Did you have for the last twelve months:
 a) Breakfast _____
 b) Between breakfast and midday meal _____
 c) Middy meal _____
 d) Between midday and evening meal _____
 e) Evening meal _____
32. Who was the bearer of the expenditure?
 a) Yourself _____
 b) other family members _____
 c) You and other family members _____
 d) Donors _____
 e) Others (specify) _____
33. Household's Average Annual Income from Microfinance Loans (if possible):
 _____ Birr
34. Rate of Loan Repayment: (please indicate as a percentage)
 _____ % (e.g., 100% means all loans are repaid, 50% means half of the loan is repaid, etc.)
35. Do you have a personal savings account for two years? Yes, _____ No _____
- If yes, a) what type of savings?
 i) banks _____
 ii) MFIs _____
 iii) Saving and credit association _____

- iv) Iqub _____
 v) Others _____
 b) Specify the average monthly saving amount in Birr:
 Compulsory _____ Voluntary _____
 c) For what purpose did you save?
 i) Loan repayment _____

Education of Household Members

36. What is the highest level of education attained by each member of your household?

Household Member	Age	Education Level
Household Head		
Child 1		
Child 2		
Other Household Members		

37. Children's Enrollment in School

(specify number of children enrolled -----and not enrolled-----)

38. Main Barriers to Children's Education

Specify the barriers faced (e.g., financial constraints) ----- and how each barrier impacts the child's education. _____

39. What is your average educational expenditure per year? Amount in Birr

40. If there are school-age children not attending school, why?

a) Needed for help in the business activities _____

b) Needed for help in non-business activities _____

c) Insufficient money _____

d) Disabled _____

e) No need for school _____

41. h) Has attained enough (specify his/her grade) _____

42. Has accessing microfinance allowed you to allocate more resources for education? If so, in what ways? -----

Living Standards of the Household

Electricity

43. Does your household have access to electricity? -----Yes----- No- if yes electricity: _____ hours/week if possible

44. If no What is your main source of lighting? -----

45. How has access to microfinance helped you improve or maintain electricity usage in your home (e.g., buying a generator, solar panels)? -----

Cooking Fuel

46. What is your main source of energy for cooking? ----Firewood -----Charcoal ----- Gas -----
Other (please specify) _____

Water Supply

Liters per day: _____ liters/day, if possible, Source (e.g., piped water, boreholes, rivers, etc.): _____.

47. How long does it take to fetch water (round trip)? _____ minutes

48. Has microfinance played a role in improving your access to clean water? -----

Sanitation (Toilet Facilities)

49. Do you have your own access to Toilet facilities _____ Yes..... No.....
if yes, the type of Sanitation (Toilet facilities) -----Pit latrine ---Flush toilet ---- Open defecation Other-----

50. If no are their public latrines in this neighborhood/area that households use as their main sanitation facility? _____ Yes..... No.....

51. If yes How far is it to the closest public latrine from your home? _____ minutes for round trip

52. Has microfinance helped improve your access to better sanitation facilities? -----

Flooring

53. What type of Flooring ☐ Earth ☐ Cement ☐ Tiles ☐ Other (please specify) _____

54. How many rooms in your house are used for sleeping? _____ (Number of rooms)

55. What is the total floor area of your household's main living space? _____ (Area in square meters)

56. How do you feel about the quality of your home's flooring? -----

Assets

57. Assets Owned by Household

Lists of all major assets owned by the household

☐ Television ☐ Radio ☐ Refrigerator

☐ Mobile phone ☐ Livestock ☐ Computer

☐ Bicycle ☐ Motorbike ☐ Car

☐ Other (please specify) _____.

Health Indicators

58. In the past 2 years, has your household experienced the loss of any children? ☐ Yes ☐ No If yes, how did the loss of a child affect your family emotionally and economically? ----- Do

you think access to microfinance could have helped you in some way to prevent or cope with this situation? -----

59. Could you respond to yourself financing to get medical facilities to your family for the last two years? Yes, _____ No ____ If yes, who could be the bearer of the expenditure? a) Yourself _____ b) Relatives _____ c) Donors _____ Others _____

60. What is the average annual household medical expenditure for the last twelve months? Amount in Birr _____

61. Do you think that your access to medical facilities or your responsiveness has been improved for the last two years? Yes, _____ No _____ If yes, what are the main reasons? a) Access of money from the loanable activities _____ b) Better local treatment _____ c) Borrowed from other sources _____ d) Sold the assets from the loan activities _____ e) Others (specify) _____

62. Health Information for Children and Adults

Provide exact weights and heights of household members for anthropometric data collection if possible -----

A. Child Health (Anthropometry for Children Aged 0-5)

For each child under 5 years of age, provide their age, weight, and height (if available)

Child 1

Age: _____

Weight: _____

Height: _____

Child 2

Age: _____

Weight: _____

Height: _____

B. Women's Health (Anthropometry for Women Aged 15-49)

For each woman aged 15-49, provide her weight and height (if available):

Woman 1

Weight: _____

Height: _____

Woman 2

Weight: _____

Height: _____

C. Male Health (Anthropometry for Men Aged 15-59)

For each man aged 15-59, provide his weight and height (if available):

Man 1

Weight: _____

Height: _____

Man 2

Weight: _____

Height: _____ How do you perceive your household's overall health and nutrition status? ---
 ----- Has access to microfinance
 enabled you to access better healthcare or nutrition for your family? If so, in what ways? -----

Section E: Coping Strategies and Adaptation

63. Which of the following can you say was true for your household at any point in time during last year as a coping strategy of food shortage?

Coping Mechanism	Yes	No
Sold productive assets		
Consume seed stock		
Eat food normally we do not eat (wild food)		
Eat less preferred food		
Sought daily work outside farm		
Migrated to find work		
Borrowed cash or grain		
Eat fewer meals per day		
Reduced quantity of food per meal		
Sold cultural items		
Sold live stocks		
Sold household effects (utensils, etc.)		
Sold firewood		
Made and sold of charcoal		
Rented out land		
Withdrew children from school		
Sold safety items		
Distressed migration		
Received relief aid		
Other		

64. Which of the following strategies have you used to cope with economic difficulties?
 (For each, please specify the frequency and amount used)

Borrowing money from relatives or neighbors Frequency per year _____
Amount borrowed (average per year) _____ Birr

Engaging in additional work (e.g., selling goods, urban poultry farming) Frequency per year: _____ Earnings per year: _____ Birr Reducing household consumption (e.g., cutting back on food or other expenses) Frequency per year: _____ Amount saved: _____ Birr Selling household assets (e.g., urban livestock, appliances) Frequency per year: _____ Total amount from sales: _____ Birr.
Other _____

65. How has access to microfinance affected your coping strategies?

- ☐ Made it easier to cope
- ☐ Had no effect
- ☐ Made it harder to cope
- ☐ Not sure in what ways has microfinance helped you cope with these challenges? -----

Finally

In your opinion, what has been the most significant impact of microfinance on your life and household? -----

How do you think microfinance has helped or hindered your ability to escape poverty in multiple dimensions (income, education, health, living standards)? -----

End of questionnaire