

**THE IMPACT OF MICROFINANCE ON CLIMATE
ACTION AND WOMEN EMPOWERMENT: A CASE
STUDY OF KOPERASI MITRA DHUAFA
(KOMIDA)**

Thesis

**Submitted to meet the Graduation Requirements of
Master's Degree (M.A in Economics)**



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ABSTRACT

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Title : The Impact of Microfinance On Climate Action And
Women Empowerment: A Case Study Of Koperasi
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Climate action has been the global talk lately as the constant rise in temperatures causes a serious threat to the existence of some nations. Low and middle-income countries like Indonesia have not been spared from the effects. Moreover, women are already vulnerable in society and climate changes have added to the disaster. Microfinance has been known to alleviate poverty and promote economic growth and development in addition to empowering women especially those in rural areas. The aim of this study is to assess the impact of microfinance from KOMIDA on climate action and women empowerment. Four indicators were used to measure each variable. Women empowerment was measured through Decision making, political participation, freedom of movement and self-worth. Three types of decision were taken into consideration which are household economic decisions, personal decisions and family decision. On the other hand, climate action was measured through Climate awareness, use of renewable energy appliances, climate action willingness and reuse of products. A mixed approach was deployed and qualitative data was collected from semi structured interviews with six clients while quantitative data was collected through a questionnaire with 283 participants. 211 were clients and 72 non-clients. Twenty-six questions were measured through a five-point Likert scale. Factor analysis using the principal component analysis was used for data reduction. Quantitative results indicated that only 5 factors can be used to explain all the twenty-six items which represented a total variance of 73%. Further results were that microfinance has no significant impact on decision making, self-worth, climate action willingness and use of renewable energy. Meanwhile, microfinance positively impacts climate awareness. On the contrary, qualitative results reveal that microfinance has provided very little awareness of climate change but has positively influenced self-worth, climate action willingness and use of renewable energy appliances. The study recommends that the government must establish a legislative framework and strategy to protect women's rights in key areas including inheritance and property ownership as it influences women empowerment. In addition, policymakers must keep women's demands in mind while developing economic policy, infrastructure, and other projects. Likewise, KOMIDA must focus on training and capacity development of its members as well as include components of climate knowledge in its non-financial initiatives that can be implemented by low literacy individuals at household level. Future studies must look into other indicators of empowerment and climate action as well as get a perspective of other microfinance institutions and government authorities in charge of climate action.

Keywords: *Microfinance, Women Empowerment, Climate Action, Komida*

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CHAPTER I

INTRODUCTION

1.1 BACKGROUND OF STUDY

Climate action has been the global talk lately as the constant rise in temperatures causes a serious threat to the existence of some nations (Winkelmann et al., 2022). The effects of climate change on people and society's economic activities are severe. This means a change in the activities is needed from the individual level to government level. Adaptation requires change of infrastructure, habits, thinking and behaviours hence it is not instant (Davies et al 2019). Climate changes also harms infrastructure and robs society of its means of subsistence (Bappenas, 2021). For this reason, the Paris Agreement was ratified by a number of nations in order to combat climate change and keep the increase in global temperature to well below 2 degrees Celsius.

Despite Indonesia and other low- and middle-income nations releasing very little greenhouse gas 2.3 metric tons per capita in 2019 (*World Bank*, 2022), they are the most vulnerable to its effects (Fankhauser & McDermott, 2014). Most middle-income countries are classified as developing countries which means they are consumers of products instead of manufacturers. This signifies less emissions of greenhouse gases and carbon emissions, yet they have to oblige to international climate policies and pay hefty taxes. Moreover, rural areas are more affected than urban setups making them victims of circumstance(Kumar et al., 2016). The less developed a region is, the more affected it is due to climate changes.

The average temperature globally has risen by 0.85 degrees Celsius throughout March per century (*NOAA Climate.gov*, 2022). This is almost 50% of the 2-degree Celsius target trying to be maintained. This rapid increase signifies how crucial the issue of climate action is. One of the ways to reduce carbon emissions is by using renewable energy. Indonesia announced a presidential decree in September 2022 that attempts to solve some of the biggest financial and regulatory obstacles facing renewables. Yet Indonesia requires significant progress in this area to reach its goal of 23% renewables by 2025. As of 2021, renewables only made up 13.5% of the energy power mix (*Bappenas*,2022).

The United Nations approved the 17 Sustainable Development Goals (SDGs) in 2015 as a component of the 2030 Agenda for Sustainable Development. These goals,

particularly the first seven, go above and beyond the Millennium Development Goals (MDGs). These objectives seek to solve several contemporary social, economic, and environmental problems while also establishing a foundation for sustainable growth. Climate change is specifically addressed by one of the 17 SDGs which is goal number 13. The "Climate Action" SDG promotes immediate action to lessen the consequences of climate change. It recognizes that international cooperation and concerted efforts from all nations are necessary to address global concerns like climate change. SDG 13 or climate action has several objectives and measures that guide it. Firstly, enhancing adaptation and resistance to dangers brought on by climate change. Secondly, incorporating climate change mitigation measures into national policies, strategies, and planning. Thirdly, promote early warning, adaptation, impact mitigation, and capacity building. Fourthly, implementation of developed countries' commitment to collect money for climate action from a variety of sources. Lastly,, promoting actions to improve the capabilities of the small island developing states and least developed countries for effective planning and management related to climate change (Akenroye et al., 2018; Davies et al., 2019; Saxena et al., 2021).

These objectives stress the significance of addressing both mitigation and adaptation options. While mitigation focuses on lowering greenhouse gas emissions to lessen the severity of climate change, adaptation calls for building resilience and adapting to the existing changes.

By curbing climate change, other SDGs can also be achieved as they are also greatly impacted by changes in the climate. For instance, achieving climate action (SDG13) through women empowerment (SDG5) will also relate to no poverty (SDG1), good health and well-being (SDG3), gender equality (SDG5), clean water and sanitation (SDG6), affordable and clean energy (SDG7), life on land and below water (SDG14).

Since the word "climate action" is still relatively new, work is still being done to define it. According to the UN Climate change refers to long-term shifts in temperatures and weather patterns, mainly caused by human activities, especially the burning of fossil fuels. In another definition, by oxford dictionary climate action is defined as the practical efforts to mitigate the effects of climate change by individual acts or political measures. According to Dimitrov (2019) climate change is a change in the weather which has progressed across many generations and decades. It also refers to weather fluctuations which can occur over long or short periods of time that influence natural catastrophes.

Climate change has affected women the most as they are already the most vulnerable in society precisely those in rural areas (Kumar et al., 2016; Momtaz & Asaduzzaman, 2018; Goh 2012). This is because they have limited access to resources for healing, rehabilitating, and rebuilding. In most societies, they are known to deal and cope with heavy family mental burdens (Singh et al., 2022) and are thus neglected when it comes to mental healing or therapy after disasters (Hayward & Ayeb-Karlsson, 2021; Stone et al., 2022).

In addition, women also have less skills in swimming or climbing trees in comparison to males. This is because they are often occupied with house chores and looking after their children which gives them less time for other activities. This puts them at a disadvantage when disaster strikes. They also often get neglected when receiving relief packs because the man is recognized as the head of the family. Similarly, the lack of skills make them prone to sexual abuse and human trafficking in such situations (Alam & Rahman, 2014).

Further, women have less access to information as they mostly stay indoors or far from town areas where announcements are made. This means they receive late information and hence have little time to prepare themselves mentally and physically to mitigate or evacuate (Aziz et al., 2022). This signifies the importance of access to information for the female gender.

Women have also become vulnerable due to the males migrating from rural to urban areas in pursuit of employment thus leaving behind their wives in charge of the land. This not only exposes to them gender-based violence but also other risks. Records show that women farmers produce 20-30% less yield than men farmers despite having the same farming skills. This connotes that women are the ones who walk large distances to collect firewood and water in addition, to taking care of their house chores and children giving them less time for farming activities. Furthermore, they clear more forests in a quest to increase output which is not in favor of SDGs (UNFCCC, 2022). Another alarming matter is despite more than 400million of women farming and producing most of the world's food supply, less than 20% have land ownership. Moreover, in Indonesia only 12.5% women between the ages 15-49 are land owners (World Data, 2020). This points out to the fact that although women contribute greatly to economic activities, they are still not granted opportunities and access to resources (Murshid and Yasmeen, 2004). Thus, empowering women by asset ownership is fundamental to building a better future not only from a societal perspective but also environmental and individual.

As women are naturally inclined to care, they are the best tool to achieve a greener economy by empowering them. It is implied that compared to previous generations at the same ages, younger women are more likely to participate in the labor force (*Women's World Banking*, 2021). It is also important to include women when making decisions in order to get a full range of perspectives since women make almost 50% of the world population (World Bank, 2021).

As there is no set standard by the world bank or UN to measure women empowerment or define it, it can only be done by using indicators which include economic contribution, economic freedom and decision-making (Sharma & Sanchita, 2016). The UN has recognized 5 aspects of women empowerment which are sense of self-worth, their right to make decisions and have options, the freedom to live their own lives both inside and outside of the house, the right to have access to opportunities and resources, their capacity to shape social change to establish a more equitable social and economic system on a national and international scale. This points out to the fact that more indicators are needed to identify and measure women empowerment.

A confederation from the climate, development, and humanitarian communities uses knowledge, the sharing of ideas, and new alliances to lower the risk of disasters, hoping to make 1 billion people safer by 2025. Sharma and Sanchita (2016) suggest that women themselves must take action for their rights and actively advocate for equality in order to break free from the archaic contradiction that women are a commodity to be kept at home. This highly signifies the importance of decision-making abilities for women.

One of the ways used to empower women has been through microfinance also known as microcredit. This refers to giving out small loans mainly to low-income people to improve their household who would otherwise have no access to financial services (Hudon et al, 2019). As unemployment increases post covid from 4.3% in 2020 to 4.4% in Q4-2021 with 0.7% annual population growth, it poses a risk to widening the gender inequality gap. Women in business and the law index score has been constant since 2005 till the last quarter of 2021 at a rate of 64.4% (World Bank,2022). This signifies the urgent need to empower women to ensure lessened inequalities between genders.

Microfinance Institutions (MFIs) are financial institutions that possess a dual nature, encompassing both a social dimension and a profit-oriented aspect (Gutiérrez-Nieto et al., 2007; Hermes et al., 2011). Their main aim is to provide financial access to people that the banks do not serve. Unlike commercial banks which also charge high interest rates, microfinance institutions typically do not demand significant collateral or have tedious

procedures and requirements, which accounts for its popularity in rural areas(Lassoued, 2017). In addition, microfinance institutions usually offer services and products according to the needs of the people and number of clients bearing in mind they also need to keep a balance between social and financial goals(Wang et al., 2021).

Some microfinance institutions precisely those implementing the Grameen model also provide non-financial services such as financial literacy or basic education to its members. When environmental objectives are added to these goals, it influences the way they function and offer products to their clientele which translates to green microfinance (Allet & Hudon, 2015). This has led to more opportunities to target a wider market. Microfinance institutions that operate mostly in rural areas target farmers to use better agricultural systems that can mitigate soil erosion and deforestation, conserve water and efficient use of arid land. Some offer loans particularly to women Business Entrepreneurs. In 2021, 13% of Indonesians living in urban and rural areas said they had borrowed money from financial organizations. According to the same survey, 52% of Indonesians hold accounts with banks or other regulated institutions like credit unions, microfinance institutions, or businesses that provide mobile money services(Indonesia, Statista 2023).

A study conducted by Atahau et al. (2021) on the integration between gender and renewable energy through Green microfinance revealed that the availability of renewable energy supports the conversion of microfinance institutions into Green microfinance institutions. This implies that when resources are available it is easier for microfinance institutions to adopt green policies within their system and offer such products to the target markets. It further implies that it is upon the shoulders of government to provide the necessary atmosphere for financial institutions to easily convert to green systems.

One such microfinance institution in Indonesia that has targeted only women is Koperasi Mitra Dhuafa (KOMIDA). Apart from offering general loans to the women, they also offer loans for household appliances that are in line with protecting the environment and renewable energy such as solar lights and biogas stoves. In addition, they provide sanitation finance which is in conformity with the SDGs. This study therefore, focuses on how microfinance programs of KOMIDA empower women and what role do these programs play in contributing towards climate action. KOMIDA has been chosen as the case study for three main reasons. Firstly, it only focuses on women as the target market of its clients. Secondly KOMIDA offers products and loans that are in line with renewable energy which supports climate action. Lastly, they offer non-financial services which have also been recognized as indicators of women empowerment.

1.2 PROBLEM STATEMENT

There is a global concern to protect the environment from intensifying climate changes and promote adaptation. Disasters have caused more harm to women than men (UNFCCC, 2022; Robinson & Veer, 2015; Sorensen et al., 2018). Apart from being mentally affected they are also emotionally, economically, socially, ecologically and politically vulnerable. This includes 75% of the world's poorest households that are directly or indirectly dependent on farming or fishing (FAO, 2009). That being said, Indonesia has more than 40% of its population as farmers. This has made policymakers and researchers to concentrate on green economy and green financing.

Indonesia as a developing economy ranks the world's fourth largest in population. The women population in Indonesia being 135million in 2021 accounted for 49.66% of the total population and is growing at an average annual rate of 1.71% (World Bank, 2021). According to the world bank the Indonesian women in the labor force accounted for 39.64% by the end of 2021. From this, it can be seen how significantly they have been contributing to economic development, and if they contribute to economic development, they can also contribute to climate action as they are naturally inclined to care. Compared to previous generations at the same ages, younger women are more likely to participate in the labor force (Women's World Banking, 2021). It can thus be concluded that there is potential for higher rates of women in active labor. On the other side of the coin, in 2021, 4.79% of Indonesian men and 6.6% of Indonesian women did not attend school. Young Indonesian women, aged between 7 to 20, are now less likely than young men to have never attended school. Over the past ten years, the number of students enrolling in school in Indonesia has gradually climbed (Statista, 2021). This correctly signifies a step taken by the government towards girl education.

The fight against climate change requires every dollar that can be raised. In this context, microfinance has been one of the ways used to empower women. Nonetheless, there is still a lot of unrealized potential, particularly in terms of expanding family financial access. Finances, outreach, and governance have all seen advances, but there are still questions about the real impact of microcredit. Infact a study by Fernando (1997) suggests that non-governmental organisations and micro credit institutions do not reach the poorest of the poor and most institutions that have effectively empowered women are the very places that discriminate them. More than half of the population in Indonesia does not have

an account with a financial institution, according to the global FINDEX database. Hence the need for inclusion to achieve 2030 SDG agenda. This highlights the role of microfinance in empowering women who can also contribute towards climate action.

As women are the most impacted by climate change, it is fair enough to include them in the fight against it. In this regard, whilst there exist many studies on women empowerment and microfinance or microfinance and climate action, there are very few that combine all three aspects in a single study. That being said, this study seeks to explore and understand deeply how women are empowered through microfinance programs at Koperasi Mitra Dhuafa (KOMIDA) and how their clients can contribute to climate action at the same time despite low literacy levels. This is in pursuit of finding indicators of women empowerment as currently there is no standard way of measuring it.

1.3 RESEARCH QUESTIONS

1. How does the microfinance program of KOMIDA empower women.
2. What role does KOMIDA as a microfinance institution play in combating climate change.
3. How can women empowerment contribute to achieving climate action.
4. How does access to microfinance contribute to raising awareness of climate action.

1.4 OBJECTIVES

1. To investigate how KOMIDA microfinance programs empower women.
2. To explore the role of KOMIDA as a microfinance institution in combating climate change.
3. To scrutinize how women empowerment can contribute to achieve climate action.
4. To survey how access to microfinance contributes to raising awareness about climate action.

1.5 SIGNIFICANCE OF STUDY

1. The study will help policymakers design more financial friendly policies that provide easier financial access to women. In addition, it will help to design policies on projects that have a positive effect on climate action.
2. The study will help KOMIDA and other financial institutions know how to empower women and to what extent empowering women contributes to achieving climate action. Further, it will help to enhance more projects for the women folk.
3. The study will help the government of Indonesia by knowing how to empower women in various ways apart from using microfinance.
4. It will be a contribution to literature for future research.

Several authors such as (Allet & Hudon, 2015; Budiman et al., 2016; Fenton et al., 2015; Helwig et al., 2020) have conducted studies on microfinance and climate changes. The studies include the effects of climate change, how to adapt to these changes and the challenges faced by microfinance institutions. Indicators of climate action which include small actions that the less educated can relate to have not been looked into. Likewise, several authors such as (Alshebami & Khandare, 2015; Rana Ejaz Ali Khan, 2012; Tariq Khan, 2018; Weber & Ahmad, 2014) have looked into microfinance and women empowerment but a large number of these studies only focus on literacy, mobility and decision making as indicators of empowerment with a few on self-worth. As a matter of fact, a large number of these studies have been qualitative in nature. Nonetheless, there have been very few studies that include microfinance, climate action and women empowerment within a single study. Some recent empirical studies include (Atahau et al., 2021; Hermawati et al., 2023; Lee et al., 2022). However, it is worth mentioning that these recent studies have only focused on one aspect or indicator of women empowerment in relation to climate action. Therefore, this study aims to fill this gap by combining several indicators of women empowerment as well as climate action within a single study. In addition, this study will utilize a qualitative and quantitative approach.

CHAPTER II

LITERATURE REVIEW

2.1 MICROFINANCE AND WOMEN EMPOWERMENT

Women constitute for almost 50% of the world's population (World Bank, 2021) and empowering them could be one of the ways to improve the economy and sustainability. Growth in the economy alone is insufficient. Instead, it ought to be focused on the advancement of women. Paramanandam & Packirisamy, (2015) make a valid point that economic progress cannot occur without the advancement of women. The study used a quantitative approach using Garret ranking technique and it was found that by generating jobs, increasing revenue, boosting purchasing power, bringing down expenses, and improving business convenience, microbusinesses provide value to a nation's economy. This not only emphasizes on the value that microfinance institutions add to economic growth but also as a way to lower unemployment rates and improve welfare. It was further recommended that in order to create more sustainable businesses, women should be taught technical knowledge, skill development, and marketing strategies. This strongly indicates that women do not only need access to finance but also technical skills. It also clearly demonstrates the need to identify more indicators of women empowerment and the various forms of measuring empowerment.

One of the ways used by government and non-governmental organizations to empower women is by offering collateral-free small loans also known as micro credit. A study by Islam (2021) conducted in Bangladesh highlights the role of Islamic microfinance to women in rural areas and it points to the fact that there has been a fundamental shift in the respondents' families' occupation patterns from agricultural to retail business. In addition, Islamic microfinance systems have significantly boosted household income, savings, and spending, as well as the standard of living and the creation of human capital. In the study, primary data was collected from 389 women respondents who had received micro credit from Islami Bank Bangladesh. Similar results were found by (Aziz et al., 2022) where microfinance has proven to be effective in uplifting their well-being and household condition even during the covid19 pandemic and beyond. Similar studies on other microfinance institutions using the Grameen model such as Akhuwat foundation in Pakistan revealed the same findings (*Imrab et al., 2018*, Rehman et al., 2020, Mustafa & Ismailov, 2008) as well as Grameen Bank in Bangladesh (Al-Amin & Mamun, 2022).

While microfinance has been acknowledged for its potential to empower women and alleviate poverty, it is not without its drawbacks. For instance, a study conducted in India by Mitra (2009) revealed that certain microfinance institutions charge exorbitant annual interest rates, reaching as high as 120%. Consequently, this practice can push the recipients deeper into debt. In fact, the study also identified instances where certain microfinance institutions exploit impoverished borrowers for financial gain, deviating from their intended objective of assisting the underprivileged.

In contrast to civilizations that treat men and women more equally, research has indicated that societies that discriminate on the basis of gender tend to suffer slower rates of economic growth and poverty reduction, and that societal gender differences result in economically unsustainable outcomes (Dollar & Gatti, 1999; Klasen, 2000). This shows the dire need to include women in the labor force. Indonesia which ranks fourth in world population consists of 49% women. According to a report by Women's World Banking (2021), the Indonesian government's National Women's Financial Inclusion Strategy (SNKI-P), which was introduced in June 2020, aimed to increase women's usage and access to digital finance by catering to their unique requirements, objectives, and backgrounds. To achieve this, SNKI-P created a gender-responsive program to broaden women's access to financial resources and services while enhancing their proficiency with digital finance. It is evident from this that the Indonesian government has already taken steps towards women empowerment (SDG5). However, the mystification remains as to why there still is low participation from the women in the active use of financial products (Moorena,2020). Utilizing financial services effectively can help increase women's economic opportunity and independence.

A study by Cameron et al., (2019) examined why the female labour force in Indonesia had come to a halt for almost two decades. The results revealed that the basic data on labour market participation, which indicate minimal change over time, conceals changes in the existing population that cancel each other out. Hence, it was projected that with the current policy settings, Indonesia would be unlikely to reach its G20 target of decreasing the gender gap in participation by 25% between 2014 and 2025.

However, a crucial inquiry arises regarding the extent of women's empowerment. An investigation conducted in Bangladesh, focusing on women's empowerment and microfinance, reveals that genuine empowerment encompasses the achievement of strategic gender needs. These needs include transforming gender power dynamics from domestic spheres to political arenas. To assess the impact of microfinance interventions,

the study considered the circumstances of women before and after joining microfinance groups for data analysis. The findings indicated that while microfinance has the potential to empower women, the level and equality of empowerment varies among individuals. Therefore, the study proposed that microfinance programs should be complemented with additional services such as financial literacy, socioeconomic training, education, healthcare, social mobilization, and legal assistance. By integrating these supplementary elements, microfinance programs can foster higher levels of empowerment (Dash et al., 2016; Nawaz 2019).

A further study was conducted by Habib & Jubb (2012) on political empowerment of women in Bangladesh through microfinance. A quantitative approach with primary data from 297 respondents was used. Results revealed that women who take part in microfinance programs have greater levels of political awareness and involvement in social and political activities than women who do not. The study further emphasized that it is essential for public policy and the organizations involved to assess the effectiveness of their efforts to empower women given the huge participation of millions of individuals in microfinance programs throughout the developing globe.

Additionally, according to Bayulgen (2008), microcredit can boost political empowerment in two separate ways. First off, by improving their economic and social conditions, the poor have a greater feeling of self-efficacy, which increases their political empowerment. The importance of socioeconomic status in shaping one's perception of their level of effectiveness has been highlighted in several research in political psychology. As their socioeconomic circumstances improve, borrowers of microcredit experience an increase in self-esteem and self-efficacy. This increase in living standards has enabled advancements in healthcare, education, and technology, which encourages the creation of new opportunities and elevates the importance of self-realization and self-fulfillment. When their financial situation improves, people may confront the organizations in charge of their welfare and shift their focus from just living to the environment. Rising economic independence and increased social health make politics more relevant and make participating in politics more feasible. Secondly, along with self-efficacy, microcredit may also aid in the development of social capital in a society. In turn, this increases people's ability to actively engage in political activities and their access to political information.

The findings are however, contrary to that of Bayulgen (2015) where it was discovered that microfinance has only moderately improved customers socioeconomic circumstances and has little to no impact on their political empowerment. The main patterns

were not considerably changed by further examination of the data, which took gender, loan type, and credit location into account. However, the results did show that group consumers, mostly women, in urban regions showed more awareness of and participation in political issues compared to individual clients living in rural villages in circumstances when political empowerment did materialize. The study utilized primary data from 100 respondents using in-depth interviews.

Decision making has been the highlight of gender equality and empowerment globally. Who is responsible for making big decisions in a household and to what extent they can participate in decision making. According to Malhotra et al., (2002) empowerment refers to a procedure that allows women to enjoy equality with males and a variety of rights that they had previously been denied. Giving someone the impression that they have decision-making power or freedom on their own does not constitute empowerment. These findings collide with that of Saqib et al., (2016) a study on women empowerment and economic growth in the Kingdom of Saudi Arabia and argues that a supportive environment that encourages the design and implementation of programs is necessary for women to participate in the labor market. This implies that despite women having decision making power which is recognized as an indicator of empowerment, there is need for government support as well as a necessary pleasant atmosphere to implement these programs and decisions.

Women's empowerment as defined by Hossain and Yaim (2011) and Yusuf (2010) is the involvement in household decision-making and financial support of the family. This is further supported by Murshid (2018) where he suggests that participating in microfinance activities increases women's power in household decision-making. The study also found that involvement in microfinance alone has less of an impact on household decision-making than does control over resources. This indicates that women have more negotiating leverage since they have control over resources. In essence, having control over resources, as opposed to merely having access to them or instruments for creating money, confers family decision-making authority. According to research conducted in Tanzania by Kato and Kratzer (2013), women borrowers had more control over their savings and revenue from their businesses. They participated in more activities outside the home, made more significant decisions, showed higher levels of self-efficacy and self-esteem, and were more mobile. Similar findings were discovered in a study conducted in Punjab by Mudaliar & Mathur (2015) where it was discovered that microfinance has improved women's social

and psychological empowerment while also enabling them to make decisions about the home via economic empowerment.

Meanwhile Al-Hossienie (2011) and Sultana et al. (2013) provide further evidence in favor of the claim that actions taken to generate revenue are a key sign of women's empowerment. In addition, to providing the certainty necessary to make decisions for the family, it offers control over money and development projects. Meanwhile some authors (Misra et al., 2021; Murshid, 2018) claim that decision making can be classified into household decisions, economic decisions, family decisions and self-efficacy.

Several authors (Bayulgen, 2015; Crocker & Knight, 2005; Kahamba & Sife, 2014) have included self-worth or self-esteem in their studies as an indicator of women empowerment. The importance of self-esteem, which is based on people's perceptions of what they need to do or be in order to prove their value as people was highlighted. According to Khan et al. (2010), income has been seen as a sign of increasing self-confidence and self-esteem. A person's conduct and attitude toward their family and community are changed by money earned via their business. Crocker & Knight, (2005) argue that these self-worth constraints act as both catalysts for motivation and potential sources of psychological fragility. These findings correctly correspond with that of a south African study by Wagner & Motileng (2019) who looked into the psychological effect of microfinance on the self-esteem and self-efficacy of the poor. Data collected from 264 participants was tested using ANOVA and MANCOVA. Results not only showed a positive correlation between the availability of microfinance and recipients' self-esteem, but also that having access to microfinance raises recipients' self-esteem. The results also indicated a decline in self-esteem in those who did not get microloans. It was recommended that developers must carefully assess the psychological effects of their activities, especially on applicants for denied microloans.

In the case of Rwandan research, it was discovered that the microfinance program's empowerment measures had a particularly positive effect on customers' self-esteem, which rose by 69 percent. It was suggested that knowledge is also directly related to self-worth and confidence (Mudaliar & Mathur, 2015). Likewise in Malaysia it was discovered that even though microfinance had a modest impact, it provided women the power to manage resources and negotiate, which improved their self-esteem in their families and communities (Al-Shami et al., 2016). According to Kim et al. (2007) people work to confirm their skills and qualities within contingent self-worth domains in an effort to boost their self-esteem. Women who took out loans reported positive changes in a number of

different aspects of their lives. There have been improvements in their attitudes, self-confidence, and respect from their spouses.

A person's mobility can be increased with the aid of microfinance, particularly for women who might have limited access to financial resources. By providing small loans and financial services, microfinance enables people to invest in income-generating activities, start or expand businesses, and improve their economic circumstances. People could be more mobile as a result since they can access new markets, fund their journey, and engage in economic activity elsewhere (Yasmeen,2015). Moreover, the author claims that the higher the level of education, the more freedom women have. Contrary to this, Aurat Foundation (2011) revealed that women were still depending on male relatives in southern Punjab rural areas and a large part of Baluchistan province. Further it was disclosed that the women could not even go to health centers alone. As a matter of fact some studies discovered that participating in microfinance sparked Gender based violence and marital problems (Murshid & Ball, 2018).

As stated by Gupta (2017) empowering women involves providing them with the opportunity to exercise their rights, achieve equality with men, and gain the freedom to make decisions, move freely, and express themselves in ways that were previously denied to them. This process of empowerment is essential for promoting gender equality and ensuring women's full participation in society. According to Addai (2017) aspects of social empowerment include freedom of mobility, dedication to educating girls, involvement in family decision-making, and a lack of stigma against daughters.

Women who are clients of most Microfinance Institutions are expected to attend regular meetings and training sessions. Additionally, before becoming a member or obtaining a loan from the institution, women receive forms or letters that require them to gather signatures from various local officials and friends for certification. These circumstances serve to enhance women's mobility and their access to valuable information. Hashemi et al. (1996) contend that weekly attendance requirements in loan programs for women boost their social mobility. By requiring specific visits to the local program office and offering sporadic training sessions, they also provide women the chance to travel outside of their communities. According to Schuler et al. (2010), women are now able to go almost everywhere, even by themselves, as opposed to the early 1990s.

Without taking the indicators into account, studying women's empowerment might be challenging. Hence four indicators are used in this study to measure women's

empowerment. These are depicted in Table 2.1 as well as the studies that served as the foundation.

Table 2.1- Women Empowerment Indicators Used in Past Studies

Variable	Indicator	Definition	Reference
Women Empowerment	Decision-making (personal decisions, Household economic decisions and Family decisions)	This refers to the ability to make choices on small and large purchase, choice involving children and choice about themselves.	Al-Mamun et al (2014) Kabeer (1999)
	Self-worth	Self-worth can be defined as a person's subjective assessment of their own merit, worth, and significance. It includes self-acceptance, self-respect, self-esteem and self-assurance	Gnawali (2018) Swapna, (2017) Kahamba & Sife, (2014)
	Freedom of movement (Mobility)	This variable describes women's unrestricted freedom of movement. It is determined by how many women travel to the market, health center, or central meeting alone.	Gangadhar and Malyadri (2015)
	Political participation	political participation means participating in voting, engaging in protests, joining political organizations, and actively participating in informal groups	Rehman et al (2020), Swain & Wallentin, (2008)

that address local community issues.

Based on the above literature the following hypotheses is developed:

H1: participation in microfinance improves women empowerment

2.2 MICROFINANCE AND CLIMATE ACTION

A study conducted in Bangladesh on Green Microfinance in promoting SDGs reveals that there is a positive correlation between green microfinance policies, green microfinance report and profitability of microfinance institutions (Uddin et al., 2021). This points out to the fact that when government creates a favorable environment for microfinance institutions it becomes easy for them to adapt and go green. However, it was suggested that individuals must be educated on being conservative in daily life activities and strict monitoring by government on green activities. Another study conducted in Pakistan on the challenges of Green banking revealed that lack of awareness, knowledge and skills, the culture of adoption to change, lack of pressure, lack of incentives, lack of legal power, culture, and infrastructure were factors causing limitations in the implementation of green banking. The potency for forest and land-based climate action is to enable societal adaptation to climate change and to provide up to 20% of the required emission reductions to achieve the target of 2 degrees Celsius. Despite these opportunities, only 3% of climate finance is used for this purpose (Katila et al., 2019). In order to reduce carbon emissions by 29% by 2030, Indonesia needs \$50 billion (Refinitiv, 2022).

A recent study by (Bakare et al., 2023) on the effects of microfinance on climate change adaptation strategies of farmers in Nigeria utilized awareness as an indicator of climate change. It was argued that if farmers are aware of their possibilities for adaptation, they should be encouraged to adopt new techniques to lessen the risks brought on by climate change. Despite this, the results unexpectedly revealed a statistically significant unfavorable association between farmers' intentions to apply for microcredit and their awareness of climate change adaptation strategies. This shows that as more rice farmers become aware of the adaption strategies to mitigate the consequences of climate change, the likelihood of obtaining microcredit declines. The study's results are in stark contrast to those of Luan et al., (2016) and Ojo et al., (2019) who both recognized credit as a crucial instrument for strengthening farmers' efforts to adapt to climate change. It was hence

recommended that educational activities aimed at increasing knowledge about climate change and agricultural production to support more extensive government-led policies should concentrate on younger generations and social groups with lower exposure to schooling.

The UN has mandated Sustainable Development Goals (SDGs) that need to be achieved by 2030. SDG 13 which calls for climate action is indeed calling for new strategies and ways to be adopted by everyone at all levels and sectors. Microfinance has benefited the economy in several ways and can also be used to combat climate change. A number of microfinance institutions have dedicated their products and services fully to women and also to curb climate change through the use of clean energy. For instance using bio-gas stoves, water saving irrigation systems, recycling plastic and use of solar panels. The ministry of investment in Indonesia has continued to promote green economy through directing investments towards infrastructure and resources that enable decreased pollution and carbon emissions as well as resource efficiency. An example is that of the new electric vehicle factory that will start operations in 2023 and will be the first in Southeast Asia. In addition, a green industrial area will be built in North Kalimantan that will not only utilize green energy but also produce new and renewable energy (Green Economy: The main focus of Investment in Indonesia,2022).

Sustainability is the main concern of green microfinance, just as it is for Islamic financing and agriculturally structured finance (Julia & Kassim, 2016;Sachs et al, 2019). Just like conventional banking and financial systems have challenges so do green financing activities. A study by Qureshi & Hussain, (2022) investigated the challenges faced by Islamic banks in adopting green banking activities in Pakistan. 26 respondents were interviewed and results showed that there are 8 factors causing hindrances of green banking implementation which included lack of culture, incentives and infrastructure. The study was qualitative and exploratory. It was recommended that there is a need for mass awareness on green activities and provision of incentives to promote green banking in financial institutions. In addition, rewards should be awarded to institutions adopting green policies which will create a healthy competition. In a similar fashion, going digital in Indonesia has also assisted in combating climate challenges. This indicates that this has been another significant step from the government in assisting towards a green economy in the financial sector. This also confirms that not all microfinance institutions have the ability to provide products and services that are in support of climate action or easily shift to green policies.

Various microfinance institutions all over the world introduced new products or services to combat the new need of fighting against climate change (Rajib,2022). Its not uncommon for such institutions to provide services according to client needs and according to regions. In Peru and Colombia micro credit was introduced for ecosystem based adaptation. In Burkina Faso, water management and solar pumps were introduced at the micro credit household level. This was happily accepted in the community with a positive effect (Yamegueu et al., 2019). Further, Chirambo (2017) claims that in various African countries, microfinance has assisted in the deployment for climate change projects.

A recent study was conducted in the United States by Latkin et al.,(2021) on the willingness levels to participate in climate change activities. The study discovered that those who indicated worry about climate change also reported desire to communicate to others about it, regardless of their political affiliations, age, color, or gender. In addition, more women than males expressed worry about climate change. Additionally, they were considerably more likely to say they would take greater political action or donate to groups that deal with climate change. These findings suggest that if women are given the opportunity and the right education on how to protect the environment, there will be positive outcomes. KOMIDA as a microfinance institution has embraced using technology to go green and reduce paper usage. In addition, they introduced solar lights, biogas stoves as well as a phone application for the field officers to keep track of transactions.

Reusing household items to promote climate action is an environmentally friendly strategy that reduces resource use, waste output, and carbon footprint. By recycling items rather than constantly buying new ones, we may lessen the demand for new production, which usually involves energy-intensive processes and greenhouse gas emissions. Reusing household items promotes a circular economy and sustainable consumption habits, which assist to reduce climate change and protect the environment for future generations. Companies in the corporate world have utilized this opportunity and waste management is the new business. At household level, re-using utensils, furnitures, and clothes is a common scenario in rural areas especially in third world countries.

A recent study was conducted by Long et al., (2019) in Japan on the carbon footprint in the city at household level from the perspective of buyers. It was observed that Tokyo had the highest electricity and gas emissions, at 22% and 23%, respectively. Further, more than 25% of household emissions came from food and transportation. Moreover, significant seasonality was seen in various household consumption categories when monthly data were examined. Accommodations, electricity, gas, education, and clothing

were among the categories. As predicted, emissions were greater in the winter than the summer. This suggests that, in addition, to a consumption-oriented economy, emissions from the residential sector also show how crucial it is to help households adopt low-carbon consumption habits. Thus, adopting green habits needs mass awareness. Many microfinance institutions especially those using the Grameen model including KOMIDA offer non-financial programs to their members on various matters.

Without taking the indicators into account, studying climate action might be demanding. Hence four indicators are used in this study to measure climate action. Table 2.2 shows the indicators that were used as well as the author that served as the foundation.

Table 2.2 -Climate Action indicators used in past studies

Variable	Indicator	Definition	Reference
Climate Action	Awareness	This variable refers to the knowledge, understanding, and consciousness of individuals, communities, and civilizations about the pressing need to combat climate change.	Ojo et al., (2019) Addai, (2017)
	Willingness	This refers to individuals preparedness and openness to actively participate in actions and efforts designed to combat climate change and its effects.	
	Use of renewable energy appliance	This refers to individuals willingness to purchase appliances that save energy	Lee et al 2022
	Re-use products	This refers to the practice of using items again for their original purpose or finding alternative uses for them instead of discarding them as waste.	

Based on the literature the following hypotheses is proposed:

H2: participation in microfinance improves climate action

2.3 WOMEN EMPOWERMENT AND CLIMATE ACTION

Globally, economic development has prioritized sustainable development. Green economy policies and initiatives are being introduced which facilitate the mitigation of the current climate change concerns. A green economy is one that significantly reduces risks to the environment, reduces ecological scarcities, and improves social justice and human well-being. The role of women in climate action cannot be underestimated as they have proven to contribute positively to economic growth. Thus, by making them more productive in green activities a green economy can also be sustained. A study by Christoff & Sommer (2018) concluded that while TANs (Transnational Advocacy Networks) may aid in expanding the breadth and scale of climate change projects using Bhungroo Technology by women farmers, it is uncertain how effectively they will be able to reach additional people and places. From this, it can be concluded that it might be due to the technology not being suitable for other farmers in a different environment within India and also not being easily adopted by women farmers. This highlights the importance of awareness for easy adoption precisely by people in rural areas.

Another study by Remteng et al (2021) tried to analyze gender tactics used in the planning and execution of Africa's Nationally Determined Contributions (NDCs). It involved identifying and breaking down the hazards associated with climate change for women in the major sectors (water, agriculture, health, and energy). The results showed that women's lives and livelihoods are put in danger due to poverty, cultural and racial obstacles, inequality, climatic dangers including floods, the occurrence of infectious diseases, and water scarcity. According to the analysis over 85% of acts in the NDCs of all African countries make reference to gender. In the rarely discussed climate change scenario, women have enormous prospects due to their coping mechanisms, environmental expertise, and environmental services they offer.

When women are given the right tools to succeed, they can create incredible futures not only for themselves but also for those around them. The empowerment of women through access to information, education, and training as well as sensitization about the risks, effects, and potential sustainable solutions (adaptation and mitigation) as well as their fundamental rights, particularly in relation to land and ownership, is necessary and can help lessen the climatic risks they face. One point worth noting in this study is that it implies

climate change is contributing to gender inequality which is a barrier to achieving SDGs 2030 and, the 2063 Africa Union Agenda.

It is essential to test solutions in practice as well as theory in order for them to work. There are already tried-and-true ways to reduce GHG emissions. Jayachandran, et al. (2017) carried out a randomized evaluation to test the effectiveness of a program that paid Ugandan landowners to not cut down their trees. According to the evaluation, the initiative decreased deforestation in the contract-covered regions without increasing it in the forests nearby. The program could be a cost-effective option because it was able to halt CO₂ emissions for less than \$1 per metric ton. The delayed carbon dioxide emissions were calculated and it was discovered that the benefit of the program outweighs the expense of the program by 2.4 times. This proves that if people are paid and increase their income, they can use the money to find alternatives to source their energy owing to the fact that in most African countries forests are cleared mainly for charcoal and timber. This also serves as evidence that preserving forests is much cheaper than replacing them by planting trees due to deforestation. However, it is worth noting that increasing the income does not necessarily mean that deforestation will be reduced as there might be other factors leading to it such as not having consistent and reliable alternative sources of energy or even cultural practices.

To sum it up, it can be seen from the above literature that there are few empirical studies conducted involving microfinance, climate action and women empowerment within a single study. Hence, there is a need to fill this gap by conducting a single study involving all three aspects with more than one indicator for each variable and this study is intended for that purpose.

2.4 STUDIES ON KOMIDA

KOMIDA, in its continuous efforts to stay competitive amidst tough competition from other microfinance institutions, has dedicated attention to innovative technology. Yeow & Lim (2018) conducted a study on KOMIDA's digital transformation journey, specifically exploring the implementation of smart card technology. Owing to financial constraints and insufficient backing from its intended beneficiaries, the smart card system to enhance field operations had to be abandoned. This points out to the fact that sustainability of microfinance institutions is still an ongoing challenge in most parts of the globe. Further, acceptance of new services and products may take a long time especially among the elderly

in rural areas. Similar results were discovered by Jaiyeoba et al., (2018) in a comparative study between Bangladesh and Indonesia to measure the efficiency of microfinance institutions. This calls for critical focus to incorporate technology in their services at a level that can easily be adopted by all stakeholders. Another study by Risqiani & Wicaksono (2020) on the recruitment and selection process of employees revealed that indeed the process of having several stages during recruitment ensured hiring of qualified personnel. Continuing the trajectory set by the aforementioned study, Febi et al., (2019) delved into examining the impact of service quality factors on the satisfaction levels of KOMIDA members specifically in the Aceh branch. The authors used a quantitative study and discovered that reliability, guarantee, empathy and physical evidence affect members satisfaction levels. However, the main weakness of this study is that members in Aceh have different behaviour than those in other parts of Indonesia and thus perceive satisfaction in a different way. Therefore, the study should be expanded in other parts of Indonesia to generalize results.

Apart from that, there have been numerous studies to investigate poverty alleviation through microfinance. Previous case study on KOMIDA by Saragih (2020) investigated this through the inclusion financial strategy. The study deployed qualitative methods and the results highlighted that there was a positive impact on the welfare of women. This was by increasing their income, enhancing their business interests through motivation and boosting their role in the family. The findings are vital because it implies that the women not only receive finance but also other skills that boost their confidence and decision-making abilities. It is worth noting that microfinance institutions that implement the Grameen model offer both financial and non-financial services.

A recent study by Anita (2021) about the Promotional Effects on Decision to Join KOMIDA, Customer Knowledge, and Motivation discovered that motivation and promotion have partially no significant effect on customer decision making. On the other hand, customer knowledge positively impacts customer decision-making. Nonetheless, the findings of the study simultaneously demonstrate a positive and significant influence of promotion, customer knowledge, and motivation on customers' decision-making process regarding financing at KOMIDA. Some other authors such as Nindi Silvia, (2020) have gone further to study the effect of satisfaction on customer loyalty. The findings support the notion that higher levels of satisfaction lead to higher loyalty. Thus, the saying customer is king. This signifies that importance must be given to customer needs and also to solve any problems that may arise with them in the quickest possible time. Based on the above,

there is a clear indication that very few studies have been conducted regarding climate action using KOMIDA as a case study.

CHAPTER III

RESEARCH METHODOLOGY

3.1. THE CASE STUDY BACKGROUND

A case study approach is adopted for this study. Both qualitative and quantitative data is used to measure each variable. When conducting research, a case study approach is used to get in-depth understanding of a specific event, environment, or circumstance. It is particularly useful when the research questions need a detailed analysis of actual occurrences, complex linkages, or odd circumstances that cannot be clearly expressed using quantitative data. In order to create in-depth insights and intricate interpretations of the case being researched, rich qualitative data are obtained and evaluated from a number of sources, such as interviews, observations, documents, and artifacts.

Several authors (Baškarada, 2014; Hollweck, 2015; Miles & Huberman, 1994) have identified the case study approach as highly suitable for qualitative research aiming to elucidate present circumstances. It proves particularly relevant when research questions involve the "why" or "how" aspects, necessitating a comprehensive and in-depth examination of a social phenomenon. This study focuses on four research questions. First, how does the microfinance program of KOMIDA empower women. Second, what role does KOMIDA as a microfinance institution play in combating climate change. Third, how can women empowerment contribute to achieving climate action. Lastly, how does access to microfinance contribute to raising awareness of climate action. From the above research questions, we can observe that they require deep understanding therefore, using a qualitative approach is befitting for this study.

Furthermore, by employing case studies, researchers can gain a holistic understanding of the study problem, facilitating the description, comprehension, and explanation of specific circumstances or issues (Baxter, P., & Jack, S., 2008; Yin, R. K, 2009). Considering these advantages, a case study approach has been chosen as the research method for this study, given the ongoing need for exploration and deeper understanding of women's empowerment and climate action using microfinance perspective.

As there are limited empirical studies on women empowerment as well as climate action, this study is intended to fill that gap. Hence it adopts a mixed approach by making use of both qualitative and quantitative data.

3.2 INSTITUTIONAL BACKGROUND

Koperasi Mitra Dhuafa (KOMIDA) was founded in 2004 initially known as YAMIDA (Yayasan Mitra Dhuafa) as a response to the Tsunami disaster and changed its name in 2009. KOMIDA is a savings and cooperative loan that implements the Grameen model and aids low-income women in getting the financing they need for their businesses or various other needs. By the close of 2022, they boasted an impressive network of over 300 branches, encompassing a vibrant membership comprising 800,000 women from 12 provinces in Indonesia. Savings balance amounted to more than 700 million Rupiah while loans were 1.9 trillion Rupiah. The institution targets only women and is a choice for them because of the lack of substantial collateral and the easy loan application process making it more convenient for the less educated precisely in rural Indonesia. KOMIDA believes women are the managers in the household, therefore, improving their welfare and empowering them is essential for development and thus they have targeted only women as their clients. Further, KOMIDA strives to satisfy the demands of its members by developing products that meet members' demands for instance they provide more than five different types of financing loans. These include general financing, micro financing business, home and business renovation financing, sanitation finance and household appliance financing. In addition, to savings and loans they offer non-financial services such as health training, motivating education for members' children, and family financial management. Its worth noting that every area has its own services and products different from other regions based on their needs. For example, the water and sanitation loans are more prevalent where open defecation is rampant. One other important factor to note is that KOMIDA consistently strives to remain at the forefront of technology by integrating it into its services, thereby providing innovative avenues for conducting transactions.

From the literature it was noted that empowerment is not only access to finance but also technical skills. KOMIDA has targeted only women as its clients and also provides non-financial programs to them. In addition, KOMIDA going digital is a positive step towards climate action. For these reasons that are in line with the research topic, KOMIDA is a desirable institution as a case study for this research.

3.3 RESEARCH DESIGN

3.3.1 QUANTITATIVE PHASE

The first phase of this study is quantitative and for this purpose, primary data is used. The data is collected from clients and non-clients by using a questionnaire. A client in this study is defined as someone who is a member and receives finance from KOMIDA. A non-client is someone who lives in the same area as the client with similar demographics and occupation but does not receive finance from KOMIDA and is not their member. Both clients and non-client are taken into consideration to observe the impact of microfinance from KOMIDA on empowerment and climate action.

The sampling technique applied in this study is purposeful sampling. This approach enables the selection of participants in accordance with the needs of the study, which is obviously intended to collect data on the phenomenon under study (Creswell & Poth, 2016). For a respondent to qualify for this study, she must be a member of KOMIDA for at least two years reason being they are in a better position to express how microfinance has helped empower them. As for the non-client, they must be from the same geographical region as the clients with similar demographics and occupation. The area chosen for the respondents of this study is Cileungsi.

The questionnaire was distributed face to face to clients and non-clients in Cileungsi around Pasir Angin and surrounding areas. For the clients it was distributed during their meetings and weekly central meetings. Any unclear questions were explained to the respondent before they answered it. Participants were from various groups as the loans are given on group to group basis as per Grameen model. A total of 211 clients participated regardless of their loan type or occupation with criteria of them being a member for atleast 2years. As for the non-clients, they were from the same neighborhoods as the clients and some were referred to by the client. Non-clients had similar demographics and occupations as the client. A total of 72 non-clients participated resulting in overall of 283 respondents for the study.

The questionnaire was formulated as follows. It consisted of two parts. The first part contained demographics of the respondent such as age, occupation, marital status and education level. The second part consisted of a five-point Likert scale questions regarding women empowerment and climate action. The Likert scale had five points 1 for strongly

disagree and 5 for strongly agree. These questions were broken down into simple and easy to understand statements using indicators of each variable. Each variable had 4 indicators and the total number of questions was 26. Nine questions were in relation to women empowerment and seventeen questions on climate action.

A psychometric tool known as the Likert scale encompasses numerous categories, providing respondents with a means to convey their perspectives, attitudes, or sentiments regarding a specific subject. In the realm of second language acquisition (SLA), Likert-scale surveys are commonly employed to scrutinize variables linked to individual disparities, such as motivation, anxiety, and self-confidence. This study uses self-worth as an indicator of women empowerment. Likert-scale questionnaires offer several advantages, including the capacity to swiftly amass data from a substantial pool of participants, the ability to yield notably reliable evaluations of individual capacities, the potential to substantiate the credibility of inferences derived from the data through diverse methodologies, and the option to compare and contrast the data with qualitative data collection methods like open-ended inquiries, participant observation, and interviews. As the study employs a mixed approach, a Likert scale is appropriate for the research (Nemoto & Beglar, 2014).

According to Bertram (2007) Likert scale is appropriate when a latent variable is inferred from other variables that are both explicitly observed and measured. In this study women empowerment and climate action are both measured through four indicators each as there is no specific way identified to measure them. Moreover, using Likert scale is simple to peruse and accomplish for participants. As the respondents of this study have low levels of education, it is befitting to use a five-point scale which is easier for them to understand. Further, Aybek et. al (2022) argues that opting for a 5-point response option offers benefits compared to employing a 3-point rating scale in terms of reliability and the informational value of the test across the scale development phase. The 5-point scale, while not significantly less reliable than a 7-point response category, also enhances respondent ease in providing answers. Therefore, it is recommended that researchers construct their scales using a 5-point response category.

The indicators of women empowerment were categorized into four namely decision making (DM), freedom of movement(M), self-worth (SW) and political participation (PP). Decision making was further broken down into household economical decisions (HED), family decisions (FD) and personal decisions (PD). Each aspect had its own question. On the other hand, climate action was categorized into four categories as

follows: climate awareness (CA), climate willingness (CW), use of renewable energy appliances (RE) and lastly, re-use of products (RP). The questionnaire therefore, comprised a total of twenty-six questions.

3.3.2 QUANTITATIVE DATA ANALYSIS

The data is analyzed in IBM SPSS version 23 using Factor Analysis. According to Rummel (1970) factor analysis is useful in research involving a small or large number of variables, such as questionnaire. Regardless of the study's methodology, anything can be categorized as a factor if it includes three or more variables (Tabachnick & Fidell, 2007). Factor analysis enables better data interpretation by allowing researchers to compress various variables into a smaller collection and expose underlying ideas. Additionally, factor analysis may be utilized for data transformation, hypothesis testing, mapping, and scaling. From the advantages mentioned of using factor analysis, they align with the research objectives and questions and therefore, this method best fits answering our research questions.

3.3.3 CODING AND ENTRY IN EXCEL

The quantitative data that was collected from 283 respondents was first recorded in excel. All questionnaires were valid and there were no missing values or data. Initially, codes were assigned to each response for the Likert scale with 1 for strongly disagree and 5 for strongly agree. As for the demographics like education level, it had four options with primary school being 1, secondary school as 2, university as 3 and none being 4. Similarly, marital status had four categories with single having a code of 1, married as 2, divorced as 3 and other as 4. As for the client and non-client, a dummy variable was assigned with 1 being a client and 0 for non-client.

Thereafter, every indicator of women empowerment and climate action was assigned a code and the following were obtained: Household economic decision(HED), Personal decisions (PD), Family decisions (FD), Political participation (PP), freedom of movement/mobility (M), self-worth (SW), climate awareness (CA), renewable energy (RE), Re-use product (RP), and climate willingness (CW).

As for decision making which is the first indicator of woman empowerment, it was measured through five items:

- Household Economic Decision (HED) 1- I believe women should get permission from their husband when going to the market.
- Personal Decision (PD) 2- I believe women should get permission from their husband when they want to buy their own dress.
- Family Decision (FD) 3- I believe women must discuss with their husband about the school choice of their child
- Personal Decision (PD) 4- I can spend my income the way I want
- Personal Decision (PD) 5- I am confident enough in my ability to make decisions like renovating my own home

Political participation was measured through one item:

- Political Participation (PP) 6- I believe women need to ask their husband whom to vote for during presidential election

Freedom of movement was measured by one item:

- Mobility (M) 7- I can easily participate in community activities outside the house without prior permission from my husband

Self-worth was measured by two items:

- Self-worth (SW) 8- I am able to prioritize my own needs and well-being.
- Self-worth (SW) 9- I am worthy of respect and consideration from others.

Climate Awareness is measured by seven items:

- Climate Awareness (CA) 10- I can easily access green space near my home
- Climate Awareness (CA) 11- I understand the importance of having green spaces
- Climate Awareness (CA) 12- I am willing to go to the green spaces even if its far from my home
- Climate Awareness (CA) 13- I understand the importance of saving energy to protect the environment
- Climate Awareness (CA) 14- I am aware of the negative impacts of climate change such as reduced sources of clean water
- Climate Awareness (CA) 15- I believe that raising awareness will reduce the impact of climate damage

- Climate Awareness (CA) 16- I feel informed about the actions I can take to reduce the effect of climate action on women

Renewable Energy is measured by four items:

- Renewable Energy (RE) 17- I Purchase low watt appliances for household use
- Renewable Energy (RE) 18- turn off bulbs when not in use
- Renewable Energy (RE) 19- I use energy saving bulbs
- Renewable Energy (RE) 20- I turn off taps and close them tightly to avoid leakages

Re-use of products was measured through two items:

- Re-use Product (RP) 21- I use re-usable items in my household like cloth bag instead of plastic bags
- Re-use Product (RP) 22- Clothes that outgrow older children are re-used by the younger child

Climate willingness is measured by four items:

- Climate willingness (CW) 23- Me and my family throw rubbish in the dustbin or trash cans if we are outside the house
- Climate willingness (CW) 24- My children do not prefer pre-packed snacks for school
- Climate willingness (CW) 25- I am willing to educate myself on how to reduce the impact of climate change on myself
- Climate willingness (CW) 26- I believe that climate action is a shared responsibility among governments, businesses, and individuals.

3.3.4 RELIABILITY TEST

Before conducting the factor analysis, a reliability and validity test was performed on the questionnaire. This is to assess internal consistency and for that, the Cronbach's alpha value for dependability was calculated. If the value is above 0.7, it can be regarded as reliable (Shrestha, 2021). Therefore, we can proceed with the factor analysis procedure.

3.3.5 PRINCIPAL COMPONENT ANALYSIS

The factor analysis is conducted using the principal component analysis. The fundamental tenet of factor analysis is that the covariation between the variables is caused by a small number of underlying factors that are not as many as the observable variables. Factor analysis therefore, presupposes the existence of a system of underlying factors as well as a system of observable variables (Yong & Pearce, 2013). To conduct factor analysis, it is recommended to have more than 3 variables and ten cases for each item (Shrestha, 2021). This study has 283 respondents and 4 indicators for each variable giving a total of 26 elements. For the above mentioned reasons, factor analysis is a suitable method in this study to know what indicators of women empowerment and climate action are more useful to describe the impact of microfinance.

Factor analysis can be conducted using Principal component analysis (PCA). This is a statistical technique used to reduce the dimensionality of a dataset while preserving its basic structure. The goal of PCA is to find a small number of components that can explain the variability in a large number of measures. This methodology, called data reduction, is generally performed when a researcher would rather exclude each of the first estimates in examinations yet at the same time needs to work with the data that they contain. PCA is frequently applied to datasets where each row corresponds to a sample and each column corresponds to a variable or feature. For this study each row represents one respondent and each column a Likert scale question for each indicator of empowerment and climate action. The total number of rows is 283 representing all respondents and 26 columns representing all the questions.

The PCA is performed using the following steps. Firstly, standardize the data with a mean and standard deviation of 0 and 1, respectively, if necessary. This step is critical when the variables have different scales. In this study all variables were measured using the same scale. Next determine the covariance matrix. PCA requires the covariance matrix of the standardized data. The covariance matrix depicts how one variable changes in relation to the other variables and shows the level of dependency between them. After that, the eigenvalues and eigen vectors of the covariance matrix have to be calculated. The eigen vectors indicate the main components, and the corresponding eigen values display the variance explained by each primary component. For this study we want eigen values greater than 1.

Next Sort and select the crucial components. The eigen vectors are typically arranged by their associated eigenvalues in decreasing order. The majority of the data variation is accounted for by the principal components with the greatest eigen values. This means we can reduce the data to a lower-dimensional space by choosing a fraction of these key elements. Therefore, only components with eigen values greater than 1 will be selected (Kim & Mueller, 1978; Kirby, 1976).

A factor loading shows the amount to which a variable contributes to the underlying factor. Higher factor loading scores suggest that the variables give a better explanation for the dimensions of the factors (Rummel 1970). In order to enhance understanding, factors undergo rotation as unrotated factors can be unclear. The objective of rotation is to achieve an optimal and straightforward structure, where each variable loads onto as few factors as possible, while maximizing the number of high loadings on each variable. In general, there are two types of rotation: orthogonal and oblique rotation. Orthogonal rotation involves rotating the factors by 90 degrees from one another, assuming that the factors are not correlated with each other. However, this assumption is less realistic as factors tend to be correlated to some extent. Two commonly used orthogonal techniques for rotation are Quartimax and Varimax rotation (DeCoster, 1998; Rummel, 1970). Varimax seeks to reduce the quantity of variables that exhibit substantial loadings on each factor, while simultaneously striving to further diminish the magnitude of insignificant loadings. Hence this study uses varimax rotation.

In order for researchers to establish a significant rotated factor loading, they must also ascertain the threshold. According to Jolliffe's criterion, it is suggested to retain factors having a loading of at least 0.7 (Jolliffe, 1986). While Kaiser's criterion dictates retaining all factors with an eigen value exceeding 1. It has been contended that the two methods might bring about misjudgment in the quantity of elements removed (Costello and Osborne, 2005; Field, 2009). Therefore, it is proposed to utilize the scree plot related to the eigen values to decide the quantity of variables to retain. The number of components over the break which is also known as point of inflexion decides the components to be retained. Therefore, the rotated component matrix along with a scree plot will be used to determine the retained factors.

3.3.6 TEST FOR NORMALITY

After that a normality test will also be conducted to ensure data were evenly distributed. This will be done by observing the skewness and kurtosis. Skewness is a metric for asymmetry in the distribution. A normal distribution has zero skewness. Positive skewness indicates a larger tail on the right side of the distribution, whereas negative skewness indicates a longer tail on the left. According to George and Mallery (2010), the values of skewness and kurtosis for a univariate distribution to be regarded as normal should lie between -2 and +2. According to Hair et al. (2010) and Bryne (2010), data can be regarded as normal if the skewness is between -2 and +2 and the kurtosis is between -7 and +7. According to Kline (2011) these ranges are 3 for the skewness coefficient and 10 for the kurtosis coefficient. A visual examination of the distribution may likewise be utilized for surveying normality, albeit this approach is normally dubious and doesn't ensure that the distribution is normal (Mardia, 1980). To verify normality visually, the histogram, stem-and-leaf plot, boxplot, P-P plot, and Q-Q plot can be checked.

3.3.7 INDEPENDENT T-TEST

Next an independent t-test is performed. An independent t-test, also known as a two-sample t-test, is a statistical test used to compare the means of two separate groups. This test is performed when there are two sets of measurements, in this case client and non-client. Independent t-test is selected because the two groups being compared are different from each other but in the same time period (Heeren & D'Agostino, 1987). Independent t-test is conducted to inspect the significant difference on climate action and women empowerment between those who receive microfinance and those who do not. To conduct this test firstly, we must have the null and alternative hypotheses. The null hypotheses proclaims that there is no significant difference between the means of the two groups while the alternative hypotheses asserts that there is a significant difference between the means of the two groups. The proposed hypotheses for women empowerment in this study is:

H0: participation in microfinance does not improve women empowerment

H1: participation in microfinance improves women empowerment

The second hypotheses is on climate action as follows:

H0: participation in microfinance does not improve climate action

H2: participation in microfinance improves climate action

After that, it must be ensured that all the assumptions have been fulfilled. The first assumption is that the two groups are independent of each other. In this case we have clients and non-clients hence the assumption is fulfilled. The second assumption is that there must be normal distribution of data. In this case we shall observe the results of the skewness and kurtosis as well as the physical observation of graphs. The third assumption is that the variances in both groups should be approximately equal.

Subsequently the means of clients and non-clients as well as the sample standard deviation will be calculated. Following that the degrees of freedom will be determined. This is calculated by adding sample size of group one and two minus two. It is abbreviated as $df=n_1+n_2-2$. Next we find the p-value or critical value. Then we compare the p-value with the test statistic. If p-value is less than 0.05 the null hypotheses will be rejected and it can be said that there is a significant difference in the mean value of the two groups which are client and non-client. On the other hand, if p-value is greater than 0.05 the null hypotheses will fail to be rejected (Sawilowsky & Blair, 1992). This depicts that there is no significant difference in the mean of the two groups. In brief if clients score higher than non-clients, then microfinance intervention will be deemed effective.

3.4 QUALITATIVE PHASE

The second phase of this study is qualitative. For this purpose, primary data is utilized. The data was collected through semi structured interviews with the clients as well as staff of KOMIDA. Two separate interviews were constructed for both parties respectively. A client in this study is defined as someone who is a member and receives finance from KOMIDA. The clients were selected from Cileungsi around the Pasir Angin and surrounding areas. The criteria to be selected as a respondent is that they must be a member of KOMIDA for atleast two years. This is because they will be in a better position to express how microfinance has empowered them.

A total of 9 interviews were conducted. 3 among them were staff of KOMIDA. This included one Social performance management (SPM) division manager and his subordinate. Finally, one field manager from the area of observation. As for the members, 6 interviews were conducted and saturation point was reached. Therefore, no further interviews were conducted. The interview questions were based on the following categories: green policies, women empowerment and climate awareness. Members were selected from different groups randomly and the interviews were open ended to allow the respondents to freely express their thoughts and understanding of the issue (Elkatawneh, 2016). The concept of "saturation point" refers to the moment in the data collecting process when researchers have gathered enough information to the extent that additional data collection no longer produces novel themes or insights. It denotes that the information acquired is sufficient to answer the research questions and its objectives. Saturation is typically reached when no new information is provided or when the newly obtained data starts to repeat or support the earlier findings (Charmaz, 2006; Mason, 2010).

According to a number of authors (Flick, 2017; Stake, 2005; Yazan, 2015), it is the responsibility of the case study researcher to gather information from a variety of sources in order to fully and accurately represent the situation being studied. Thus, both the staff and beneficiaries of KOMIDA were interviewed. To tackle anonymity, names of beneficiaries and staff are replaced with codes such as Respondent1, respondent2 and staff1, staff 2 etc.

The study also made use of organisational documents like reports of KOMIDA, charts, and plans as well as government reports on climate change and women empowerment. Furthermore, observation of activities at KOMIDA Ciluengsi branch as well as the staff and beneficiaries are taken into consideration. Apart from that, audiovisual materials from their social media are observed.

A thematic analysis approach was used to analyse the findings. Early on, the researcher familiarized themselves with the data by reading the transcripts again. Thereafter used data reduction to construct initial codes that matched topics with the goal of the study. Following the data reduction, the researchers developed preliminary themes with the aim of focusing on the primary subject of the study. In order to assess whether the development of subthemes is required, the themes were developed and analyzed to make sure they are consistent with the goal of the study. The researcher then advanced to the last phase of manuscript writing.

CHAPTER IV

FINDINGS AND DISCUSSION

4.1 QUANTITATIVE DATA

Table 4.1- Respondents Descriptive statistics

Age group		Occupation		Education Level		Membership		Marital Status	
22-30	24	Housewife	50.2%	Primary	39.6%	Client	74.6%	Married	90.5%
31-40	116	Business	47.7%	Secondary	38.2%	Non-client	25.4%	Divorced	2.8%
41-50	114	Farmer	2.1%	University	0.7%			Other	6.7%
51-60	22			None	21.6%				
61-70	7								
Average age									
41									

From Table 4.1 it can be observed that 50% of the respondents are housewives and 47% are business owners while only 2.1 % are farmers. This means that a large population of the occupants of Cileungsi area are not active in paid labor. In addition, only 21.6 % of total respondents have no education while primary school drop outs recorded the highest of 39.6%. This points out to the fact that a large portion can read and write. This means the illiteracy levels are quite low. The oldest participant in this study was 67years old who is a client while the youngest is only 22 also a client. Further, more than 70% of respondents are clients of microfinance at KOMIDA while 25% are non-clients. The married respondents composed of 90.5 % while there was no unmarried respondent. Widows accounted for 6.7% and divorcees were only 2.8%. From this, it can be concluded that most participants of microfinance have basic education and are married.

Table 4.2- Reliability Test

Cronbach's Alpha	Based on Standardized Items	Alpha on N of Items
.925	.923	26

Before proceeding with the factor analysis, the internal consistency for the questionnaire is conducted by measuring Cronbach's alpha, a metric for instrument accuracy and dependability. To be regarded suitable, the Cronbach's alpha threshold value must be higher than 0.7 (Shrestha, 2021). For the variables with whole scale reliability, the Cronbach's alpha coefficient is 0.925 and is greater than 0.7 as illustrated in Table 4.2. It demonstrates that the variables correlate with the components that make up those variables, proving that they are internally consistent. This means we can proceed with factor analysis.

Table 4.3- Descriptive Statistics

	Mean	Std. Deviation
Household Economic Decision	3.2968	.95848
Personal Decision	3.1661	.94755
Family Decision	3.4488	.92254
Political Participation	3.2580	.85504
Mobility	3.0989	.89369
Personal Decision	3.1343	.86479
Personal Decision	3.0459	.89602
Self-worth	3.0565	.87741
Self-worth	3.4134	.80475
Climate Awareness	3.0424	.86601
Climate Awareness	3.0283	.95608
Climate Awareness	2.9152	.91086
Climate Awareness	3.0495	.96629
Climate Awareness	3.0035	.90506
Climate Awareness	2.9788	.88701
Climate Awareness	2.9293	.85175
Use Renewable energy	3.3039	.89891
Use Renewable energy	3.8975	.71960
Use Renewable energy	3.8763	.71625
Use Renewable energy	3.9223	.67448
Re use products	3.7562	.68463
Climate willingness	3.6996	.68279
Climate willingness	3.5583	.62395

Re use products	3.6466	.69615
Climate willingness	3.5866	.70114
Climate willingness	3.5901	.71074

The data reduction was performed using principal component analysis. Initial Eigen values were set to be greater than 1. Orthogonal rotation used was varimax rotation method and it gave the descriptive statistics results represented in Table 4.3. As seen all mean values were in the range of 3 and Standard deviation is close to 1.0 for all values.

Table 4.4- KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.868
Bartlett's Test of Sphericity	Approx. Chi-Square	6307.912
	df	325
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) and Bartlett test results are depicted in Table 4.4. As seen, the KMO value is 0.868 which is greater than 0.6. KMO values below 0.6 indicate insufficient sampling, and corrective action should be done. The significance level is 0.000 which is less than 0.05. This means that the value is significant at 1% level of significance. The significant value of less than 0.05 suggests that a factor analysis for the given data set would be beneficial. When factor analysis is used to assess questionnaires, it provides incredibly helpful information that enables decision-makers to focus on a small number of crucial factors rather than a large number of considerations (Shrestha, 2021). Using this method is particularly beneficial for this study as it will give us a clear view on which indicators are useful to measure the selected variables in this case women empowerment and climate action. Thus, it is appropriate to proceed with principal component analysis.

Table 4.5- Total Variance Explained

Component	Initial Eigenvalues	Rotation Loadings	Sums of Squared
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	Total	% Variance	of Cumulative %	Total	% Variance	of Cumulative %
1	9.454	36.363	36.363	6.138	23.609	23.609
2	3.985	15.328	51.690	3.920	15.075	38.684
3	2.312	8.892	60.583	3.384	13.016	51.701
4	1.881	7.235	67.818	3.069	11.803	63.504
5	1.527	5.872	73.690	2.648	10.186	73.690
6	.898	3.453	77.143			
7	.694	2.670	79.813			
8	.643	2.473	82.286			
9	.587	2.257	84.543			
10	.476	1.831	86.374			
11	.436	1.679	88.053			
12	.424	1.631	89.684			
13	.371	1.425	91.109			
14	.316	1.216	92.325			
15	.304	1.168	93.493			
16	.261	1.003	94.496			
17	.211	.813	95.309			
18	.210	.807	96.116			
19	.195	.751	96.867			
20	.167	.643	97.510			
21	.151	.580	98.090			
22	.132	.508	98.598			
23	.122	.470	99.068			
24	.090	.346	99.414			
25	.078	.298	99.712			
26	.075	.288	100.000			

Extraction Method: Principal Component Analysis.

The number of components extracted from the principal component analysis along with their eigen value and total variance are depicted in Table 4.5. Only components with eigen values greater than 1 will be retained. By applying this criteria we have five components with Eigen values greater than 1. These five components explained a total variance of

73.69%. This means that all twenty-six items of women empowerment and climate action can be explained through 5 components only and they explain a total variance of 73%.

Factor extraction is the process of identifying the smallest number of factors required to fully represent the connections between the set of variables. The underlying problems can be found using a variety of techniques. Finding factor solutions may be done using both principal component analysis and common factor analysis. This study used principal component analysis (PCA) since one of its objectives was to identify the bare minimum of components required to fully represent the supplied data set. A substantial eigenvalue is greater than 1.0, which indicates that the component explains more common variation than unique variation. Since factors are latent constructs that were created as aggregations of measured variables, they should contain more than one measured variable.

Only components with eigen values greater than 1 are retained as seen from Table 4.5. This means we have only five retained components. The first component is climate awareness and has an eigen value of 9.4 which represents a total variance of 36.3%. The second component is decision making and it had a total eigen value of 3.9 and total variance of 15.3 %. The third component is renewable energy and had eigen value of 2.3 and a total variance of 8.8%. The fourth component is climate willingness and had eigen value of 1.8 and total variance represented 7.2%. Lastly, the fifth component self-worth had an eigen value of 1.5 and a total variance of 5.8%. These five retained components represent a total variance of 73.6%. Thereafter the five retained components were rotated using Varimax orthogonal method and the results are illustrated in Table 4.6.

Table 4.6 - Rotated Component Matrix^a

	Component				
	1	2	3	4	5
Question 13- Climate Awareness	.893				
Question 11-Climate Awareness	.869				
Question 14- Climate Awareness	.857				
Question 15- Climate Awareness	.837				

Question 12- Climate Awareness	.837		
Question 10- Climate Awareness	.791		
Question 16- Climate Awareness	.732		
Question 17-Renewable Energy	.619	.378	
Question 1- Household Economic Decision	.369	.842	
Question 2- Personal Decision		.841	
Question 3- Family Decision	.385	.837	
Question 4- Political Participation		.816	
Question 5- Mobility		.597	.489
Question 20- Renewable Energy		.886	
Question 19- Renewable Energy		.880	
Question 18- Renewable Energy		.866	
Question 21- Re use of products		.618	.369
Question 25- Climate willingness			.796
Question 24- Re use of Products			.770
Question 26- Climate Willingness	.311		.754
Question 23- Climate willingness			.686
Question 22- Climate willingness		.499	.611
Question 7- Personal Decision		.330	.814
Question 8- Self-worth			.805
Question 9- Self-worth			.689
Question 6- Personal Decision	.321	.477	.536

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 7 iterations.

According to Jolliffe’s criterion, it is suggested to retain factors having a loading of atleast 0.7 (Jolliffe, 1986). Thus, five factors with their loadings have been retained. Total number of elements loaded is seventeen. The first factor extracted is climate awareness which is an indicator of climate action. This factor has five components loaded on it. The second factor extracted is decision making which is an indicator of women empowerment. This factor has four components loaded on it which includes household economic decisions, personal decisions, family decisions and political participation. The third factor is renewable energy which is an indicator of climate action. This factor had three components loaded on it. The fourth factor comprised components of climate action that is re-using products and climate willingness. It has three factors loaded on it. Lastly, the fifth component had two factors loaded on it. The two components are personal decision and self-worth which are indicators of woman empowerment. Table 4.7 is a summary of the five retained components along with their eigen values, factor loadings, mean and standard deviation.

Table 4.7- Extracted components with factor loadings and mean value

Factor 1- Climate Awareness			
variable	Loading	Mean	SD
Question13: I understand the importance of saving energy to protect the environment	0.893	3.04	0.96
Question11: I understand the importance of having green spaces	0.869	3.02	0.95
Question14: I am aware of the negative impacts of climate change such as reduced sources of clean water	0.857	3.00	0.90

Question15: I believe that raising awareness will reduce the impact of climate damage	0.837	2.97	0.88
Question12: I am willing to go to the green spaces even if its far from my home	0.837	2.91	0.91
Eigen Value	9.45		
Percent of Variance	36.36%		
Factor 2- Decision Making			
Question1(Household Economic Decision): I believe women should get permission from their husbands when going to the market.	0.84	3.29	0.95
Question2(Personal Decision): I believe women should get permission from their husband when they want to buy their own dress.	0.84	3.16	0.94
Question3(Family Decision): I believe women must discuss with their husband about the school choice of their child	0.83	3.44	0.92
Question4(Political Participation): I believe women need to ask their husband whom to vote for during presidential election	0.81	3.25	0.85
Eigen Value	3.98		
Percent of variance	15.32%		
Factor 3- Renewable Energy			

Question20: I turn off taps and close them tightly to avoid leakages	0.88	3.92	0.67
Question19: I use energy saving bulbs	0.88	3.87	0.71
Question18: I turn off lamps when not in use	0.86	3.89	0.71
Eigen Value	2.3		
Percent of variance	8.89%		
Factor 4 – Climate willingness & Re use of Products			
Question25(willingness): I am willing to educate myself on how to reduce the impact of climate change on myself	0.79	3.58	0.70
Question24(Re-use of Products): Clothes that outgrow older children are re-used by the younger child	0.77	3.64	0.69
Question26(willingness): I believe that climate action is a shared responsibility among governments, businesses, and individuals.	0.75	3.59	0.71
Eigen Value	1.8		
Percent of variance	7.2%		
Factor 5 – Self-worth			
Question7: I am confident enough in my ability to make decisions like renovating my own home	0.81	3.04	0.89
	0.80	3.05	0.87

Question8: I am able to prioritize my own needs and well-being.	1.5
Eigen Value	5.8%
Percent of Variance	
Total Variance	73.69%

From the above five extracted components the following sub hypotheses is developed,

H1-participation in microfinance improves women empowerment

H1-a: participation in microfinance improves decision making

H1-b participation in microfinance improves self-worth

The second hypotheses on climate action is also broken down into sub hypotheses as follows:

H2: participation in microfinance improves climate action

H2-a: participation in microfinance improves climate awareness

H2-b: participation in microfinance improves use of renewable energy

H2-c: participation in microfinance improves climate action willingness

Next a test for normality was performed on the five extracted components. This is to ensure normal distribution of the data. This was done by observing skewness and kurtosis and the results are represented in Table 4.8.

Table 4.8- Skewness and Kurtosis

	Skewness	Kurtosis
Climate Awareness	0.019	-1.015
Decision Making	-0.245	-0.433

Renewable Energy	-0.494	2.199
Climate Willingness	-0.530	0.626
Self-worth	-0.504	0.148

From the results it can be noted that climate awareness skewness is 0.019 and kurtosis is -1.015

Decision making skewness is -0.245 and kurtosis is -0.4333.

Renewable energy skewness is -0.494 and kurtosis is 2.199.

Climate willingness skewness is -0.530 and kurtosis is 0.626.

Self-worth skewness is -0.504 and kurtosis is 0.148.

According to Hair et al. (2010), Bryne (2010), Kline (2011) and Demir, (2022) when the skewness coefficient is outside the range of 2 and the kurtosis coefficient is beyond the range of 7 the normalcy assumption is not satisfied. According to Kline (2011) these ranges are 3 for the skewness coefficient and 10 for the kurtosis coefficient. Meanwhile, Field (2013); Gravetter & Wallnau (2014); George & Mallery (2010) and Trochim & Donnelly (2006) argue that the acceptable range is -2 to +2. It can thus be concluded that the data were normally distributed according to all the above mentioned authors. This was further verified by observing the Q-Q plots as illustrated.

Figure 4.1 Q-Q Plot of Climate Awareness

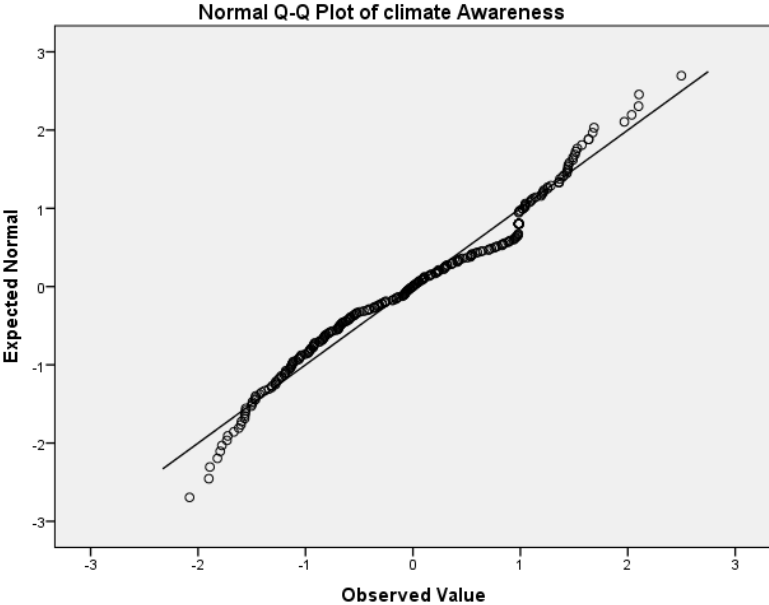


Figure 4.2 Q-Q Plot of Decision Making

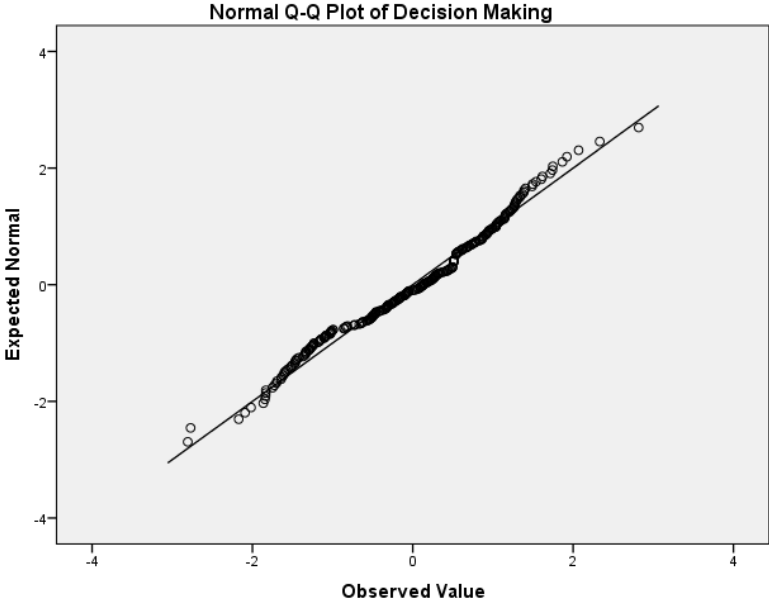


Figure 4.2 Q-Q Plot of Renewable Energy

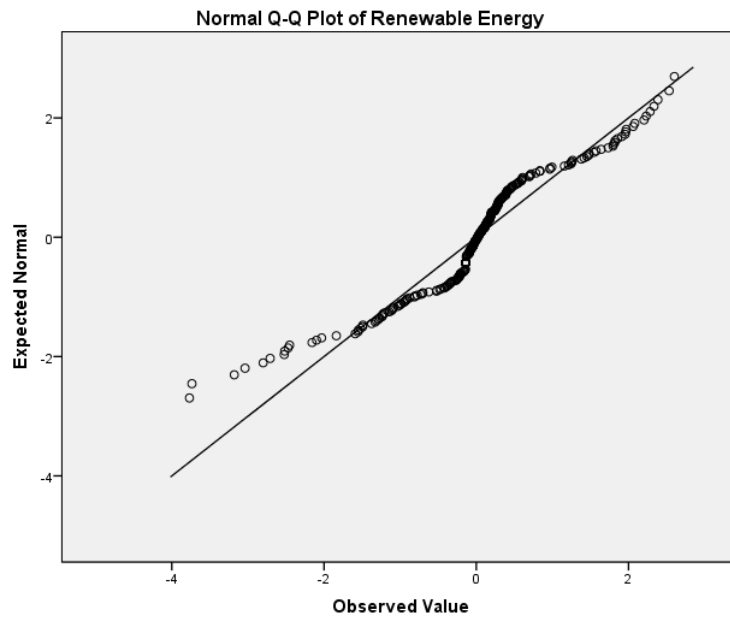


Figure 3.4 Q-Q Plot of Climate Willingness

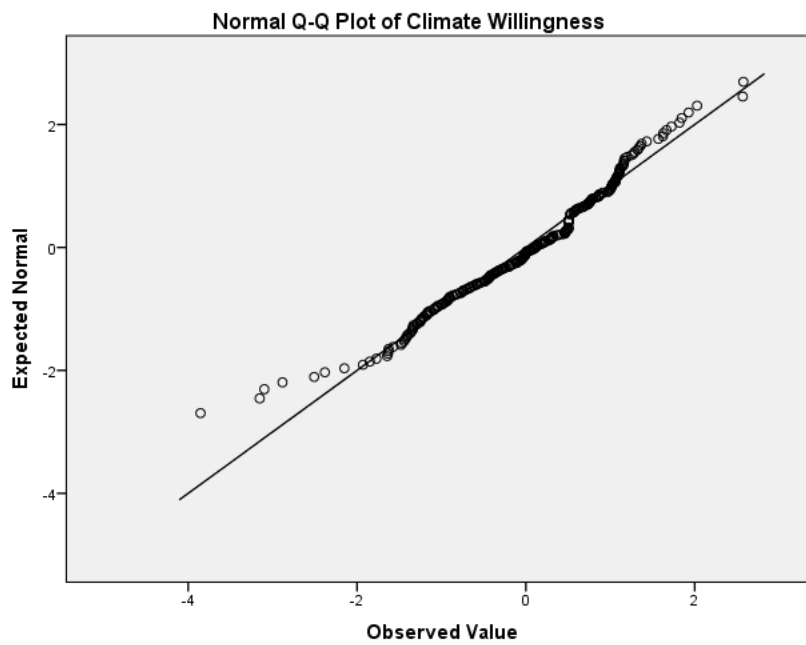
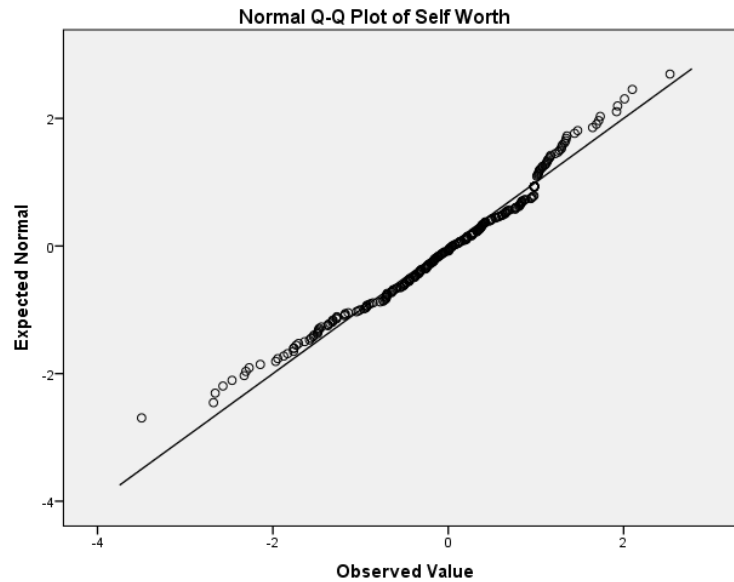


Figure 4.4 Q-Q Plot of Self-worth



Next the independent t-test is performed on the five extracted components namely climate awareness, decision making, renewable energy, climate willingness and self-worth. The independent t-test is a test performed when there are two sets of measurements distinct from each other, in this case client and non-client. This test is conducted to inspect the significant difference on climate action and women empowerment between those who receive microfinance and those who do not. If the clients score is higher than the non-clients, then microfinance intervention will be deemed effective. Independent t-test is selected because the two groups being compared are different from each other but in the same time period (Heeren & D'Agostino, 1987). To compare the difference in the scores of clients and non-clients, the mean values will be observed. If clients have a higher mean value than the non-client it depicts microfinance indeed has an effect on the named factor or indicator. Thereafter the p-value will be examined and a conclusion will be made. If p-value > 0.05 then it assumed that the difference between the two groups is not statistically significant. That is to say there is equal variance between the two groups (Sawilowsky & Blair, 1992). The results of the independent t-test are depicted in Table 4.9:

Table 4.9

Independent t-test

		Mean	P-value	t
Climate Awareness	client	.1933055	.000*	5.890
	nonclient	-.5664925		
Decision Making	client	-.0152643	.185	-.439
	nonclient	.0447327		-.430
Renewable Energy	client	.0354722	.625	1.022
	nonclient	-.1039534		1.142
Climate Willingness	client	.0123732	.465	.356
	nonclient	-.0362604		.355
Self-worth	client	.0510556	.112	1.473
	nonclient	-.1496214		1.614

*Significant at 95% confidence interval

From the statistics of all the five retained factors depicted in Table 4.9 we can observe the following:

The first factor which is climate awareness, has a mean value of 0.19 for clients which is higher than that of the non-client -0.56. The p-value is 0.00 which is less than 0.05 therefore, statistically significant at 95% confidence level. This indicates that microfinance indeed has an effect on climate awareness for clients. This can be alluded to the fact that KOMIDA provides loans on water and sanitation for building toilets, agriculture loans, septic tanks for safe drinking water, housing renovation and house appliances like solar lights, biogas stoves and water filters. This may have contributed to awareness about climate changes but not through the non-financial programs offered. In addition, the provision of these loans is according to the needs of clients specific to the area where such problems occur. Therefore, not all clients are aware about the effects of climate changes on the environment. Likewise, KOMIDA provides loans for business start-ups and existing business which supports those involved in handicrafts like weaving or basket making from coconut leaves. This has also aided in climate awareness although the information they have from clients perspective is very limited. This signifies that they are unaware of the harmful effects on themselves as individuals as well as being unaware of how they can contribute to climate action at household levels.

The outcome from this study further supports the notion of KOMIDA striving to incorporate technology in its transactions with members to support green policies. This is by introducing an application for field officers to keep track of member payments. This is to reduce the use of paper and have a green economy. This further indicates that KOMIDA is aware of climate changes and is adapting to its effects by offering new products and also changing the way of handling their operations. This in turn affects the awareness of climate change on their clients to a limited extent.

Similar results were found by Almario-Desoloc, (2014) in Philippines where microcredit impacted positively on climate awareness among its members. This was after the flood disaster occurred whereby many NGO's and microcredit institutions took advantage of the opportunity to restore the welfare of victims. This signifies that when people have been affected directly by climate change, they are keen on knowing how to protect themselves and mitigate future consequences despite being unaware of indirect effects. Another study on African countries claimed that empowerment of women through climate change differs considerably from country to country (Nhamo, 2014). A recent study in Kashmir on climate change suggested that women must be agents and part of the decision making process at national level concerning the distribution of resources on climate action projects (Dar et al., 2023). This is because ladies are more inclined to care and have different preferences, needs and concerns from men, and are bound to be dynamic in supporting regulations assisting women, children and families (UNIFEM, 2008). Undoubtedly, women empowerment is about more than financial profit; it is tied in with empowering women to carry on with lives of prosperity and respect, in view of balance, freedoms and equity (Esplen and Brody, 2007).

The second factor which is decision making, has a mean value of -0.01 for clients and 0.04 for non-client. The p-value is 0.185 that is greater than 0.05 meaning that it is not statistically significant at 95%. This indicates that microfinance does not have an effect on decision making. Similar results were found by Murshid, (2018) in Bangladesh where large and small purchases by women were not affected by participation in micro credit. Women were considered to be in charge of the household thereby taking control of all decisions. This is similar to the Indonesian culture where women are more independent and in control of the household in comparison to other cultures thus no effect by microfinance participation.

According to global statistics, Indonesia is ranked 92nd out of 146 countries in the rankings of the gender gap in the globe (statista,2022). As a developing country, Indonesia

ranking below 100 is a sign of significant progress and development in this perspective. This is also an indication that the government has already taken measures to empower women by making them part of the active labor force. According to the world bank the Indonesian women in the labor force accounted for 39.64% by the end of 2021. As a matter of fact, 47.7% of the respondents in this study were business owners. This indicates the willingness and participation of women in income earning activities.

Apart from that, KOMIDA provides loans for business startups as well as existing businesses. This acts as a motivator for them to have their own business as they will have access to capital as well as training to manage their finance. Moreover, most women work from home so its convenient as they don't have to neglect their family duties. It is worth noting that for income equality for comparable jobs in Indonesia, the Global Gender Gap Index score in 2022 was 0.7, up from 0.69 in 2021. This signifies positive steps towards closing the gender gap. A study by (Murshid, 2018) conducted in Bangladesh discovered that the more control women have over resources the more empowered they are in decision making. This explains the results why microfinance doesn't impact decision making as 47% of the respondents were business owners.

However, these findings are in contrast to that of (Al-shami et al., 2018; Kato & Kratzer, 2013; Varghese, 2011) where it was discovered that microcredit has indeed empowered women in decision making at household level. It was argued that when they participate in bringing an income to the home, they have more power to make decisions. Despite that, a study conducted in Sri Lanka by Yogendrarajah, (2013) interestingly discovered that women can be empowered through decision making at household level but only in decisions regarding cooking. Bigger decisions involving purchase of assets or jewelry were still controlled by the man of the house. This was due to religious and cultural practices where the man is regarded as the head of the house and the woman has to be submissive. Nonetheless, it has been observed that recent studies reveal more empowerment of women at household levels compared to older studies where most economies were still patriarchal. This could be due to adapting to modern lifestyles where women are more outspoken than in the past. This scenario could further explain the situation in Indonesia as more than 39% of women in 2021 were part of the active labor force (Women's World Banking, 2021) thereby microfinance having no impact on decision making.

The third factor which is renewable energy had a mean value of 0.03 for clients and was higher than -0.10 for the non-clients. The p-value is 0.625 which is greater than

0.05 meaning it is not statistically significant at 95% confidence level. This implies that microfinance has a positive effect on the intention of clients to use renewable energy appliances but not significantly. This can be confirmed by KOMIDA providing loans for renewable energy appliances such as solar lights and biogas stoves in certain areas but not in the area of observation which is Cileungsi. This demonstrates that they have the awareness and desire to use them if they are available to them. In addition, KOMIDA provides non-financial programs that instills values regarding management, commitment and responsibility in members. This teaches them to be responsible citizens and respect their environment and be dutiful in protecting it. The findings are in line with Atahau et al., (2021) where it was proved that there is a direct relationship between green microfinance and renewable energy with gender as a mediating role. Further Farhar, (1998) argued that programs for sustainable economic development should include microfinance, renewable energy, and gender roles. This acknowledges the fact that women can indeed play a role in use of renewable energy by using microfinance. Though many studies have been conducted on emissions at industrial levels, few have been studied at household level. As a developing country, Indonesia is a consumption oriented economy which means they are a target of the manufacturing nations. Therefore, encouraging use of renewable energy at household level is a significant step to achieve a green economy. However, it should be noted that availability and affordability of such appliances is crucial to effective implementation of such programs.

According to Allet, (2011) microfinance institutions can have many ways of looking into climate action. While some concentrate on reducing their internal ecological impact through environmentally friendly choices within their operations, others direct their efforts towards the portfolio level. At the portfolio level, the goal is to minimize the indirect environmental effects stemming from the activities of the clients they finance. Others adopts a 'defensive' strategy with a core objective of 'doing no harm.' Their approach involves actively avoiding financing activities that result in significant pollution or the excessive exploitation and degradation of natural resources. Conversely, some other microfinance institutions embrace a more positive approach. They proactively design and offer specialized products and services to support environmentally-friendly activities, practices, and technologies. Through these initiatives, they contribute to promoting sustainability and eco-friendly practices within their supported communities. It can thus be concluded that KOMIDA has initiated a multiple approach to address this issue. In spite of that more knowledge to adopt green habits at household level must be provided to the clients through direct interaction with them at the weekly meetings.

Factor four that is climate willingness had a mean value of 0.01 for clients and is higher than that of non-clients which is -0.03 and the P-value is 0.465 which is greater than 0.05 suggesting that its not statistically significant at 95% confidence level. This indicates that microfinance has an effect on climate willingness but not significantly. This can be attributed to the fact that their members are willing to take loans for building toilets under the water and sanitation loan or loans for renewable energy appliances and loans to renovate their houses indicating their willingness against climate change. Apart from the provision of eco-friendly loans, there is no other program providing action on climate change hence not statistically significant. Besides, KOMIDA offers products as per needs of clients thus not all clients are willing to take a loan to build a toilet or have a septic tank if it doesn't pertain to their need. This signifies the need to provide information on actions that the clients can do according to their abilities and household level. A study in Cambodia found that despite 60% clients willing to pay for purchasing latrines, the sales were slow and not on the rise. This was attributed to the fact of negative peer effect. If a neighbor installed a latrine, the chances of a household getting their own was very low (Ben Yishay et al., 2017). In another study conducted in Brazil (Moser & Forcella, 2015) results showed that adopting a simple theoretical approach focused on green initiatives at the micro/end-user level reveals significant synergies between green microfinance actions and the existing programs, services, and products offered by the examined microfinance institutions. These synergies encompass financial, human/social capital services, and economic aspects, providing practical means for customers to enhance their adaptability and for microfinance institutions to mitigate weather-related risks. It is essential to use caution while dealing with the systems designed to offer emergency loans in the short term prior to climate shocks. This is because if climate disasters become more common and severe in the future, borrowers may face greater debt loads in the medium to long term. It can thus be concluded that despite KOMIDA providing loans aimed at mitigating climate impacts, they need to also instill green habits in the members that can be implemented in their daily lives at the household level.

The fifth factor that is self-worth had mean value of clients 0.05 which is higher than the non-client -0.14 while the p-value is 0.112 and is greater than 0.05 indicating non significance at 95% confidence interval. This indicates that microfinance has a positive effect on self-worth but not to a great extent. This can be attributed to the fact that by providing access to financial services like microloans and savings accounts, microfinance empowers those who were previously excluded from the established banking system. This enhanced financial inclusion may boost their self-esteem and confidence due to their

improved control over their financial circumstances. Moreover, KOMIDA only has female members. This makes them not feel neglected. Apart from that, owing to microfinance, aspiring entrepreneurs can launch or grow their small businesses. People gain a sense of accomplishment and improved self-worth when their businesses expand, and they usually become more involved in their families and communities as a result. This is evident from the number of business women among the respondents that accounted for 47%. Similar results were discovered by Al-shami et al. (2018); Kahamba & Sife (2014) and Kato & Kratzer, (2013) where microcredit has positively impacted self-efficacy.

Many microfinance institutions also offer support and training to their clients. These classes might involve financial literacy, company management, and the acquisition of occupational skills. The acquisition of new skills and knowledge might help customers feel more confident (Crocker & Knight, 2005). Furthermore, social recognition contributes to boosting self-worth. Microfinance can lead to an improvement in social standing and community recognition. Successful entrepreneurs and responsible borrowers usually gain respect and praise from their peers, which boosts their self-worth. As KOMIDA uses the Grameen model where loans are given in groups, members have to keep their integrity by paying on time. Defaulting will make them lose respect and injure their reputation in their community. Similar results were discovered in south Africa by Wagner & Motileng, (2019) where those rejected to participate in microcredit had less self-efficacy compared to those accepted.

To sum it up, the mean values of clients are higher than that of non-clients for four components namely Climate awareness, Renewable energy, climate willingness and self-worth. While the mean value of the second factor that is decision making is lower of the client than the non-client. This illustrates that microfinance has an impact on climate awareness, use of renewable energy appliances, climate willingness and sense of self-worth. Meanwhile microfinance has no effect on decision making. Three types of decisions were looked into which includes household economic decisions (HED), personal decisions (PD) and family decisions (FD). On the other hand, the P-values were not statistically significant at 95% confidence interval for decision making, use of renewable energy, climate action willingness and sense of self-worth while p-value for climate awareness is statistically significant at 95% confidence interval. This points out to the fact that while KOMIDA may have an effect on the use of renewable energy appliances, sense of self-worth and climate action willingness it is not sufficient. This highlights the need for more

effort in the non-financial programs and weekly central meeting to provide more information to members on the above-mentioned aspects.

4.2 HYPOTHESES TESTING

Table 4.10 Hypotheses Testing

		Levene's Test for Equality of Variances	t-test for Equality of Means				
		Sig.	t	df	Mean Difference	95% Confidence Interval of the Difference	
						Lower	Upper
Climate Awareness	Equal variances assumed	.000*	5.890	281	.7597	.5058	1.0137
	Equal variances not assumed		6.787	164.09	.7597	.5387	.9808
Decision Making	Equal variances assumed	.185	-.439	281	-.0599	-.3290	.2090
	Equal variances not assumed		-.430	118.76	-.0599	-.3360	.2160
Renewable Energy	Equal variances assumed	.625	1.022	281	.1394	-.1292	.4080
	Equal variances not assumed		1.142	153.21	.1394	-.1017	.3806
Climate Willingness ^s	Equal variances assumed	.465	.356	281	.0486	-.2204	.3177
	Equal variances not assumed		.355	122.21	.0486	-.2228	.3200
Self-worth	Equal variances assumed	.112	1.473	281	.2006	-.0674	.4687
	Equal variances not assumed		1.614	146.63	.2006	-.0450	.4464

*Significant at 95%

The first hypotheses regarding women empowerment is subdivided into two indicators of empowerment namely decision making and sense of self-worth.

H1-a: participation in microfinance improves decision making

An independent t-test sample was conducted to determine if a difference existed between the mean of clients and non-clients of KOMIDA from Ciluengsi area in light of women empowerment. Three types of decisions were taken into account namely household economic decisions (HED), personal decisions (PD) and family decisions (FD). From Table 4.10 as seen the p-value is 0.185 and is greater than 0.05. This indicates that it is not statistically significant at 95% confidence interval. Hence the researcher failed to reject H₀. That is to say participation in microfinance does not improve decision making

H1-b participation in microfinance improves self-worth

An independent t-test sample was conducted to determine if there was a difference in self-worth of clients and non-clients. From Table 4.10 we observe that the p-value is 0.112 and is higher than 0.05. This denotes non significance at 95% confidence interval. Therefore, the researcher does not reject H₀. This implies that participation in microfinance does not improve sense of self-worth.

The second hypotheses on climate action is also broken down into three indicators which are climate action awareness, use of renewable energy appliance and climate action willingness.

H2-a: participation in microfinance improves climate awareness

From the independent t-test conducted to see if there is a difference in climate awareness of clients and non-clients it can be observed that the p-value is 0.00. This is less than 0.05 meaning that it is statistically significant at 95% confidence interval. Hence the researcher rejects H₀. This means that participation in microfinance improves climate awareness.

H2-b: participation in microfinance improves use of renewable energy

The results of the independent t-test conducted on the intention to use renewable energy appliance between clients and non-client reveal that the p-value is 0.625. This is higher than 0.05 thus not statistically significant. Hence the researcher failed to reject H₀.

That is to say participation in microfinance does not improve the use of renewable energy appliances.

H2-c: participation in microfinance improves climate action willingness

An independent t-test sample was conducted to determine if there was a difference in the willingness against climate change between clients and non-clients. From the results it is observed that the p-value is 0.465 and is higher than 0.05. This denotes non significance at 95% confidence interval. Therefore, the researcher fails to reject H0. This implies that participation in microfinance does not improve climate action willingness.

A summary of the hypotheses can be depicted as follows:

Table 4.11- Hypotheses Testing Summary

	Hypotheses	P-value	Description
H1-a	participation in microfinance improves decision making	0.185	Accept H0
H1-b	Participation in microfinance improves sense of self-worth	0.112	Accept H0
H2-a	participation in microfinance improves climate awareness	0.000	Reject H0
H2-b	Participation in microfinance improves use of renewable energy appliance	0.625	Accept H0
H2-c	Participation in microfinance improves climate action willingness	0.465	Accept H0

In a nutshell, the studies quantitative findings from the factor analysis are that among twenty-six items proposed to identify climate action and women empowerment, only five items can be used to explain both variables. Each variable had four indicators having a total of eight. Women empowerment indicators included Decision making, political participation, self-worth and freedom of movement. Three types of decisions were considered namely household economic decisions, Family decisions and personal decisions. On the other hand, climate action also had four indicators namely climate awareness, use of renewable energy appliance, climate action willingness and re-use of products. The findings from the principal component analysis reveal that the five indicators

that correlate more with women empowerment and climate action are climate awareness, decision making, use of renewable energy appliance, climate action willingness and lastly, self-worth. Moreover, the findings also indicate that participation in microfinance improves climate awareness but does not improve use of renewable energy appliances, climate action willingness, decision making and self-worth significantly.

Therefore, to answer the first research question from the quantitative perspective of how the microfinance programs at KOMIDA empower women, it can be said that they improve their self-worth to a small extent only. This is by solely targeting the women folk to look after and upgrade their welfare. Further those who are uneducated or have low literacy levels and cannot access finance from banks are not left out hence feeling worthwhile. In addition, KOMIDA constantly motivates members and provides access to information on various matters through their non-financial services that non-members cannot access. Apart from that members are taught commitment and responsibility. This adds to their integrity and reputation among peers. Though it should be noted that there are no specific programs aimed at boosting self-worth hence it was not statistically significant.

To answer the second research question that is on the role of KOMIDA as a microfinance institution in combating climate change. It can be said that they provide awareness to their members at portfolio levels only. This is through offering loans that are eco-friendly as well as using eco-friendly systems in their operations in support of green policies. This points out to the fact that the clients lack information on the negative impacts of climate change on themselves as individuals. Further, members are willing to educate themselves about climate change. This signifies that there is a need to give them more information on what to do at household level to adopt green habits. This information can be disseminated through the non-financial programs or at the weekly central meetings which highlights that more focus and effort must be put in these programs.

The third research question is how can women empowerment contribute to achieve climate action. Since women are in charge of the household it can be said that at household level, they must be encouraged to adopt green habits. These can be in the form of small actions like re-using products so as to reduce emissions from further productions in the factories. In addition, they must be encouraged to save energy through the use of energy saving lamps or turning off lamps when not in use. Likewise, reducing use of plastics bags when going shopping by carrying your own cloth bag, using reusable utensils instead of disposable ones, and closing taps to avoid leakages. It must however, be noted that availability and affordability of appliances that save energy is crucial.

The last research question is how accessing microfinance contributes to raising awareness of climate action. In the case of KOMIDA it can be said that the information passed is mostly indirect through their types of loans offered. In addition, it is internal through environmental friendly choices within their operations such as using phone application to keep track of records instead of paper writing. Thus, only those acquiring specific loans such as those related to water and sanitation, septic tanks, housing renovation, agriculture loans are aware of how climate changes has negatively affected their life. They are not aware of the negative impacts of climate change to the world as a whole.

4.3 QUALITATIVE DATA RESULTS

A total of nine interviews were conducted and six among them were clients. The other three were staff of KOMIDA. The clients who were interviewed belonged to different member groups from different areas within Cileungsi. The oldest was sixty years old while the youngest was thirty-six. All respondents were married except one who is a widow. Four among them are housewives and two had home business. One had a laundry business and the other sells food (warung). Three respondents had been to primary school while two had completed secondary level. The oldest among them had never attended school. Regarding the staff, one was the Social performance division manager (SPM) from the headquarters in Jakarta, second staff was his subordinate and finally one field officer.

Saturation point was reached after six interviews therefore, no further interview was conducted. The concept of saturation point refers to the moment in the data collecting process when researchers have gathered enough information to the extent that additional data collection no longer produces novel themes or insights. It denotes that the information acquired is sufficient to answer the research questions and its objectives.

The researcher observed that more than half of the interviewees have atleast basic education. This means they have the ability to read, write and count, therefore, it makes them more independent. This in turn gives them the ability to make their own decisions. The higher the education levels, the more independent in decision making abilities. A study by Roy et al (2017) revealed that age, education, income, and employment were all positively correlated with women's involvement in decision-making. The findings are also in support of this studies quantitative data results which discovered that microfinance had no impact on decision making of all types including personal, family and household. It is

important to note that this signifies the government has already taken measures for girl education in Indonesia. Albeit, these findings are in contrast to that of Al-shami et al (2018); Kato & Kratzer, (2013) and Varghese, (2011) where they discovered that microfinance positively impacts decision making. However, it is worth mentioning that big decisions on purchase of large items involving a huge amount of money were done collectively by spouses. At times, this involved getting opinions from their children if they were old enough. The following were the responses when asked who makes the decision to purchase large items,

R1: “well because now I'm over 60 years old so I let my children to decide since they know more about these modern electric devices and other things more than me.

R2: “I'm the one who makes the decision because my husband trust that I have the ability to choose well.

R3: “me and my husband decide it together. we make decisions together because I have to consult him”.

Responses on the decisions about the school choice of the child varied. Some respondents said they made the decisions alone since the husband gave them the responsibility of all decision making. In fact, some added that their husbands trust them to make good choices hence left such matters for them to decide. Meanwhile two respondents stated that they make a collective decision. Responses were as follows:

R1: “I choose their school for them until senior high school but I give them the opportunity to choose the university themself because I believe they are now adults and can choose what is best for them. So my responsibility is only till high school and my husband trusts my choice because he knows that I will make the best choice for my children. So he gave me the opportunity to select the school for them”.

R2: “I still manage to do everything because my husband has given me that responsibility”

R3: “me and my husband make the decision together because I have to consult him since he is our child”.

R4: “I let my children decide”.

R5: “I discuss it with my children because they are now in high school and need to be comfortable with the school environment but when they were younger I selected their school and my husband accept my choice and follow it because he trusts me”.

Hence it can be concluded that the larger the decision is, the more people involved while smaller decisions especially those involving the kitchen are made by the women themselves as they are perceived to be more knowledgeable in that regard and managers of the household.

Regarding the freedom of movement, three respondents said they could go anywhere alone. Two among them were business owners. The other two stated that they needed to ask their husband as they had no ability to ride motorbike. However, if the place was not far away from home, they could easily go out without seeking his permission. One respondent stated she needed to seek permission before going out of the house regardless of distance. Despite this, all respondents emphasised that they needed to inform the husband on their whereabouts. As for widow she stated she must inform her children whenever she is going anywhere. Some of the responses recorded were:

R1: “no I don't need permission from him because we have been married for more than 30 years and we are both almost 60 years old so he doesn't question me again. I can do whatever I want”.

R2: “yes I can go alone but since I can't ride the motorbike I have to ask my children to accompany me and if they are not available I have to inform him because he must know where I am”.

R3: “yes I have to inform him about my whereabouts otherwise he will be worried about me”.

From this, it can be noted that all respondents are security conscious. Despite having freedom of movement, family members needed to know of their whereabouts. In addition, it can be said that lack of technical skills in women is still rampant especially in developing countries. Hence it can be concluded that microfinance has no impact on freedom of movement. Contrarily, some authors (Gangadhar Ch, 2015; Kato & Kratzer, 2013) found microfinance to impact freedom of movement as well as influence more activities away from home.

Interestingly, a study in Malaysia which is also dominantly Muslim found the effect of microfinance on women empowerment to be partial or ineffective though the author claimed that microfinance enhanced decision making in the household as well as control of resources. A study in Oman which is also typically a Muslim majority nation also had similar findings (Varghese, 2011). It is worth mentioning that in recent studies it has been observed that more women are beginning to participate not only in active labor

but also in activities outside the home as well as income earning activities rather than the traditional ways of women staying indoors and looking after their families. This could explain the ineffectiveness of microfinance on women empowerment especially in mobility. This is in line with Vyas, (2018) who claims that the purpose of skill development is to raise people's performance and job quality beyond only making them ready for the workforce. Empowering women with skills has aided their transition from physical labor to office work. Besides, the more skills women have, the more empowered they are.

Likewise, it was observed that owning a business indicated asset ownership and empowerment amongst women which increased their worth in the family and community. Some authors such as Akinbode & Hamzat, (2017) have identified asset ownership as a contributing factor of empowerment. Similar findings in a recent study were discovered by Amir-ud-Din et al., (2023) arguing that Women who had assets were 14% more likely to feel empowered than those who did not. KOMIDA offers loans for both existing business and start-ups as well as providing financial literacy and management to business owners. Common types of business for KOMIDA members in the Pasir Angin and surrounding area included laundry, tailoring, *warung*, massage, salon and selling clothes. It is worth mentioning that covid19 greatly affected these small businesses and they are still trying to stabilize themselves. To support business recovery, KOMIDA extended its loan repayment times. Thus, it can be concluded that KOMIDA has empowered women through asset ownership.

Correspondingly, KOMIDA has contributed to sense of self-worth among its clients. This is by motivating them and teaching them commitment as well as management. Crocker & Knight, (2005) contend that a person's perception of what they must be or achieve in order to be worthwhile as a person has a significant impact on their sense of self-worth. These determinants of self-worth are regions of psychological vulnerability as well as sources of motivation. In order to increase self-esteem in domains of contingent self-worth, people make an effort to defend their abilities and characteristics. A closer look into the psychological effect of microfinance on the poor in South Africa revealed that people who were denied microfinance suffered a decline in their sense of self-worth (Wagner & Motileng, 2019). This is evident as one of the respondents stated:

R4: “yes because in this area most women have their own business and are more independent but for me I don’t have a business and depend on my children’s income so I discuss everything with them”.

This is further proven by the results of the quantitative data where microfinance proved to improve self-worth although not significantly. The findings of this study are also in line with (Gnawali,2018) where he stated that microfinance institutions have played a crucial role in enhancing women's self-esteem through various means, including improving their overall well-being, granting them access to and control over resources, eradicating illiteracy among women, and enabling their active participation in economic decision-making processes, among other positive impacts.

Furthermore, all interviewees are married except one who is a widow. Their ages ranged between 36 – 60. This explains that they have a sense of responsibility towards their family and are thus committed to improving their welfare. Hence, they participate in microfinance. Moreover, it explains their willingness to participate against climate action as they think about the future of their children. Similarly, their willingness could be attributed to being a member of KOMIDA as one of the aims of KOMIDA is to teach them commitment and responsibility. Some of the respondents remarked,

R1: “they need to have monthly counselling to give us awareness and knowledge about it because sometimes we might not be aware of the challenges that we are facing. So, if they can give us more knowledge on this, it can help me in my household life and also for my children”.

R2: “I think if they have weekly meeting on this it will be more better because if we know about this we'll know how to manage it more and maintain our environment”.

R3: “weekly meetings to inform us more about climate and how we can manage it because on our side we can just do it by keeping our environment clean. We must keep our houses clean and to throw rubbish in its place and to teach our children about it”.

On the other side of the coin this highlights the lack of climate awareness education by KOMIDA programs. Nonetheless, the respondents are enthusiastic to learn more on climate action and implement the knowledge. A recent study in United States on the willingness to participate in climate change actions by Latkin et al (2021) discovered that males were significantly less likely than females to engage in political actions like calling a lawmaker or attending a climate change conference. Further, People who are concerned about climate change also say they are open to discussing it with others. This implies that women are more inclined to care naturally therefore, involving them in protecting the environment is necessary. The burden therefore, lies in the hands of KOMIDA to change

the willingness into implementation through small actions relatable to their clients at the household level.

It was further observed that KOMIDA has embraced technology to support green economy. Though this is internal in their operations level, it is further being discussed at management level to go a step further and introduce it at client level. Field officers now use an application to keep track of payments from clients. This has not only reduced usage of paper but also on work time. Respondents seemed to be impressed with this as it reduced the time spent at the central meetings. Some of them had the following to say in response to the question raised regarding digitalization,

R1: “I don’t know more about it but the staff started using the smartphone for recording transactions but before everything was on the papers. But we still have the booklet which we keep with us where we can check our record of payment”.

R3: “yes we get many advises from them regarding our health and responsibility and commitment and also how to manage our money. Even the staff started using smartphone so we don't spend a long time at the meeting”.

R4: “they teach us how to manage our finance and also I see that now the staff have improved they are using the smart phone so we don't spend more time at the meeting we can go home faster”.

From the above responses it is clear that despite reducing paper usage, the respondents have limited knowledge on climate change effects especially as a global issue. In other words they are unaware of the indirect impacts even on themselves. This indicates that KOMIDA needs to incorporate such knowledge in its educational programs to clients as they have embraced climate action on portfolio level only. According to Allet, (2011) microfinance institutions can have many ways of looking into climate action. While some concentrate on reducing their internal ecological impact through environmentally friendly choices within their operations, others direct their efforts towards the portfolio level. At the portfolio level, the goal is to minimize the indirect environmental effects stemming from the activities of the clients they finance. Others adopts a 'defensive' strategy with a core objective of 'doing no harm.' Their approach involves actively avoiding financing activities that result in significant pollution or the excessive exploitation and degradation of natural resources. Conversely, some other microfinance institutions embrace a more positive approach. They proactively design and offer specialized products and services to support environmentally-friendly activities, practices, and technologies. Through these initiatives,

they contribute to promoting sustainability and eco-friendly practices within their supported communities. KOMIDA provides water and sanitation loans in regions where open defecation is prevalent though in the area of study which is Cileungsi there were no clients of such loans. They also provide septic tanks to combat water scarcity. Apart from that they support climate friendly business by offering business loans such as those involved in basket making and handicrafts and weaving. Moreover, they have a partnership with international organisations such as water.org As such it can be said that KOMIDA offers products in favor of climate action.

To sum it up, the qualitative data findings are that KOMIDA empowers women in various ways including financial empowerment and education through boosting their self-esteem and motivating them. Additionally, they empower women through asset ownership by providing business loans. Likewise, some of these businesses are eco-friendly and re-use products which is in favour of climate action. Despite the clients having limited knowledge on climate changes, they are willing to educate themselves about it.

Therefore, to answer the first research question of how microfinance programs of KOMIDA empower women, it can be said that they enhance their self-worth and provide financial empowerment. However, the programs were found to be ineffective in decision making ability and freedom of movement.

Regarding the second research question on the role of KOMIDA as a microfinance institution in combating climate change, it was observed that they have incorporated strategies at portfolio level only. The non-financial programs do not offer information or knowledge concerning climate action. More effort must be put by providing knowledge to clients through the educative programs so that they adopt green habits at household level.

For the third research question on how women empowerment contributes to achieve climate action, it can be said that since they are naturally inclined to care, if even given the right tools and skills they can protect the environment as well. This stems from their willingness to educate themselves and participate in climate related activities. So far they have contributed by having businesses like basket making and weaving that use natural and re-use products.

Lastly, the fourth question is about how access to microfinance contributes to raise awareness on climate action. It can be concluded that the clients only know the direct impacts on the environment through the types of loans offered. Their knowledge about its effects on themselves and globally is very limited as no information has been offered

through the non-financial programs. This highlights that KOMIDA must put more effort in this aspect.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

The global concern to protect the environment from intensifying climate changes and promote adaptation has forced transformations in the way we do things regardless of the sector. This is in order to honor the Paris Agreement and strive to keep global temperatures below 2 degrees Celsius. Women are the most vulnerable in society and climate changes has not spared them. Disasters have caused more harm to women than men. As microfinance is known to have assisted in alleviating poverty, contributing to economic growth and also empowering women, this study seeks to find out how microfinance programs can impact climate action and women empowerment. KOMIDA was selected as the case study for 3 main reasons. Firstly, their members are only women, secondly they offer renewable energy appliances and other climate friendly loans which are in line with the study objectives. Lastly, they offer non-financial programs that have been identified as indicators contributing to woman empowerment by the UN. The study has four main objectives. Firstly, to investigate how KOMIDA microfinance programs empower women. Secondly, to explore the role of KOMIDA as a microfinance institution in combating climate change. Thirdly, to scrutinize how women empowerment can contribute to achieve climate action. Lastly, to investigate how access to microfinance contributes to raising awareness about climate action. Previous studies have mainly focused on either microfinance and climate action or microfinance and women empowerment while this study focuses on all three aspects within a single study. In addition, previous studies on women empowerment and climate action focus on using only one indicator while this study applies more than one indicator for each variable thereby filling the research gap.

The research questions are answered by using a mixed approach with qualitative data from semi structured interviews and quantitative data through the use of questionnaires. 283 respondents participated for quantitative data in this study with 211 clients while 72 were non-clients. Purposeful sampling was applied and only clients who have been members of KOMIDA for at least two years were picked as respondents. The research methodology deployed is factor analysis using the principal component analysis with varimax rotation. Four indicators were used to identify women empowerment namely Decision making, political participation, freedom of movement and self-worth. In terms of

climate action, four indicators were also examined to determine the impact of microfinance. They are climate awareness, use of renewable energy appliances, reuse of products and climate action willingness. A total of twenty-six components were analyzed. The findings from quantitative data reveal that only five components can be used to identify women empowerment and climate action namely Climate awareness, decision making, use of renewable energy appliance, climate willingness and sense of self-worth. Further findings indicated that microfinance does not significantly influence decision making, use of renewable energy appliance, climate willingness and self-worth but it positively influences climate awareness. This can be insinuated from the fact that KOMIDA provides loans that are climate friendly such as water and sanitation loans, septic tanks, housing renovation, solar lights and biogas stoves. This may have added to the clients having information and awareness about climate changes. However, it is worth mentioning that their knowledge on how climate changes negatively affects them as individuals or how the world is affected by it is very limited. This means that the efforts put in by KOMIDA are not sufficient enough. This can be attributed to the fact that KOMIDA has incorporated to combat climate changes at portfolio level only by offering products that are ecofriendly and incorporating technology in their operations to support green economy and policies. The non-financial programs however have not contributed to climate awareness at household level. This is evident from the findings of qualitative data. For this reason the use of a mixed approach is vital to understand the dynamics involved in empirical findings.

On the other hand, qualitative findings discover that microfinance has a positive influence on sense of self-worth, reuse of products, and climate action willingness. In contrast the respondents displayed very limited knowledge about climate awareness. On a broader scale, KOMIDA has introduced specialized loan products tailored to the specific needs of its clients, such as water and sanitation loans, agricultural loans, and housing renovation loans. Although these initiatives aim to address issues such as open defecation, which not only pose risks in terms of waterborne diseases but also jeopardize the safety of drinking water they do not add to the knowledge on climate change effects to the client. Yet such initiatives have improved the welfare of clients by empowering them. Consequently, KOMIDA's offerings align with promoting climate action only at portfolio and operations level. By focusing on women's empowerment, financial inclusion, and environmental sustainability, KOMIDA contributes to the overall well-being of its members. Through the provision of financial resources, educational support, and the promotion of climate-friendly practices, KOMIDA enables women to become active agents in their communities, fostering their self-esteem and motivation. Furthermore, by offering

specialized loan products that target specific needs, KOMIDA tackles pressing environmental challenges and promotes sustainable practices. Therefore, microfinance can serve as a tool to educate members about climate action by encouraging small-scale environmentally friendly habits at the individual level. In brief it can be said that despite empowering women, KOMIDA has done very little to increase climate awareness.

5.2 RECOMMENDATIONS

KOMIDA: The implications of this study to KOMIDA are to incorporate elements of climate knowledge into the non-financial programs that assist household-level climate action. This can be through teaching clients about adopting green habits such as using energy saving lamps, using a cloth bag when going shopping, use of non-disposable utensils and closing taps tightly to avoid water leakages and the like. In addition, KOMIDA needs to give more focus on training and capacity development for the members. This is to enhance women empowerment in terms of self-worth and decision-making abilities as the programs so far were found to be non-impactful in this aspect.

GOVERNMENT: It is recommended to the government to create a legal framework and a plan of action to safeguard women's rights in important domains including inheritance and property ownership. This is because asset ownership has been acknowledged to enhance self-worth and decision-making ability which empowers women. Additionally, while creating economic policy, infrastructure, and other initiatives, they must have women's needs in mind. Further, government can utilize the presence of micro financial programs to disseminate information regarding climate action as microfinance mostly works very closely with women especially those with low literacy levels.

ACADEMIC: For future research it is recommended that the perspective of other microfinance institutions as well as government authorities must be included to make general observations. Likewise, observation can be made between clients before joining microfinance and after. This is due to the limitation of this study which is that the observation was between client and non-client in the same time period not for an individual before and after joining microfinance from KOMIDA. Moreover, non-clients of KOMIDA could possibly be clients of other microfinance institutions in the area as this was not

considered when collecting data from respondents. Further, the study focused only on Cileungsi branch and every region has specific services offered according to the demand in the area. Therefore, it is recommended that further studies include KOMIDA members from other areas. Lastly the limitation is that of using factor analysis. This technique does have its drawbacks, and one of them lies in the challenge of effectively naming the factors involved. The factor names may not always provide an accurate representation of the variables encompassed within each factor. Additionally, certain variables present a difficulty in interpretation due to their potential association with multiple factors. Therefore, it is recommended for future studies to add more indicators of climate action and women empowerment.

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APPENDICES

Appendix 1- STAFF INTERVIEW

1. What are the requirements for someone to be a client of KOMIDA?
2. How have climate changes affected the implementation of your services?
3. Did you have to introduce new products or services due to climate changes?
4. How have your customers responded to the new services or products?
5. In your opinion, Are your customers aware of the causes and effects of climate changes? If not, have you offered programs to create awareness?
6. What challenges do you face in implementing green policies?
7. In your opinion Should environmental issues be handled by microfinance institutions or by other actors?
8. In your opinion, do microfinance institutions have the capacity to manage environmental issues? Can they help mitigate environmental risks?
9. Do you tackle some environmental issues within KOMIDA? How?
10. What actions do you think are necessary for the government to address climate change?
11. How do the programs offered by KOMIDA enable the women to make better decisions?
12. After attending the programs are they willing to implement the knowledge?
13. What challenges have you faced in empowering women who are uneducated?

Appendix 2- BENEFICIARY INTERVIEW

1. Who makes the decisions about purchasing large household items such as fridge?
2. Who makes the decisions about purchasing small household items like kitchen utensils?
3. Who makes the decision about which school the child should attend?
4. Do you need permission from your husband when buying your dress? Why?
5. Who has the final say on how money is spent?
6. Do you need to get permission from your husband if you wish to attend activities outside the house? Why?
7. Are you allowed to go alone to the market or health centre? why or why not?
8. Do you need to get permission if you want to participate in community activities like KOMIDA meeting? Why?

9. Can you describe any challenges you faced when making any of the above decisions?
10. How did you overcome them? Does culture affect your ability to make decisions?
11. Have you ever faced discrimination because of your gender? Do women and men have equal opportunities to access finance in your community?
12. Should women have equal pay as men for the same type of job?
13. What do you know about climate action?
14. How have climate changes affected you personally? What did you do to overcome or reduce the effects?
15. How has the community you live in been affected by it?
16. How often do you use disposable cups, plates and plastic bags? Do you bring your own bag for shopping? Do you prefer paper bags to plastic bags?
17. Did you consider purchasing low-wattage appliances or energy efficient light bulbs when purchasing? Why or why not?
18. What is the main source of lighting in your home? Have you ever considered using renewable energy appliances like solar lighting or biogas stove? Why?
19. Do you always turn off electrical appliances or light bulbs in the daytime or when not in use?
20. Has attending programs from KOMIDA enlightened you about climate action?
21. Do you practice the knowledge you learn from KOMIDA at your home or in your daily life?
22. Has attending KOMIDA programs helped you to make better decisions in your life?
23. What type of initiatives and programs do you think are most effective to empower women's participation in climate action?
24. What policies and practices do you think are needed to support women's participation in climate action?

Appendix 3- QUESTIONNAIRE

- Age: _____
- Occupation: _____
- Marital Status: single Married Divorced other
- Education level: Primary school Secondary school University None
- Non-client Client

Please indicate the extent to which you agree with the following statements:

		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
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1	I believe women should get permission from their husbands when going to the market.					
2	I believe women should get permission from their husband when they want to buy their own dress.					
3	I believe women must discuss with their husband about the school choice of their child					
4	I believe women need to ask their husband whom to vote for during presidential election					
5	I can easily participate in community activities outside the house without prior permission from my husband					
6	I can spend my income the way I want					
7	I am confident enough in my ability to make decisions like renovating my own home					
8	I am able to prioritize my own needs and well-being.					
9	I am worthy of respect and consideration from others.					
10	I can easily access green space near my home					
11	I understand the importance of having green spaces					
12	I am willing to go to the green spaces even if its far from my home					
13	I understand the importance of saving energy to protect the environment					
14	I am aware of the negative impacts of climate change such as reduced sources of clean water					
15	I believe that raising awareness will reduce the impact of climate damage					
16	I feel informed about the actions I can take to reduce the effect of climate action on women					

17	I Purchase low watt appliances for household use					
18	I turn off bulbs when not in use					
19	I use energy saving bulbs					
20	I turn off taps and close them tightly to avoid leakages					
21	I use re-usable items in my household like cloth bag instead of plastic bags					
22	Me and my family throw rubbish in the dustbin or trash cans if we are outside the house					
23	My children do not prefer pre-packed snacks for school					
24	Clothes that outgrow older children are re-used by the younger child					
25	I am willing to educate myself on how to reduce the impact of climate change on myself					
26	I believe that climate action is a shared responsibility among governments, businesses, and individuals.					