MICROCREDITS AND RURAL LIVELIHOOD FOR SUSTAINABLE CONSERVATION OF BIODIVERSITY: A CASE STUDY OF COCOBA IN MAHALE ECOSYSTEM, KIGOMA-TANZANIA

BY

ELIDA NANZALA FUNDI

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN RURAL DEVELOPMENT OF SOKOINE UNIVERSITY OF AGRICULTURE. MOROGORO, TANZANIA.

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ABSTRACT

This study was done in Mahale Ecosystem to assess the achievement of COCOBA in improving rural livelihood and sustainable conservation. This study was based on the fact that, while there are adequate information o n micro credit and poverty reduction few exist on livelihood improvement and sustainable conservation of biodiversity. Specifically the study sought to document socio-economic activities undertaken by COCOBA group members and others in the study area; determine the performance of COCOBA on the supported socio-economic activities; determine the contribution of COCOBA to livelihood reductiona and to determine the participation of local community in environmental conservation in relation to COCOBA. Using household questionnaire, focus group discussion and key informant discussion from three villages and 120 randomly selected household, the study found that the main socio- economic activity undertaken in the study area was Agriculture which causes environmental degradation. Small scale business was found to be implemented most by COCOBA members due to credit accessibility. The study further showed that COCOBA has brought positive changes in the standards of living of its members. COCOBA members earned more income per year (1 546 057.56) than non members (828 045.35) as observed at T-test analysis. Furthermore, the study shows that COCOBA model contributes in environmental conservation because majority of its members were engaged in tree planting, beekeeping and uses of improved stoves. The study concluded that since the success of COCOBA model depend much on training, environmental training and post –credit training on entrepreneur, should be offered often to improve its performance. The study draws a number of recommendations including; Allocation of adequate financial resources for lending to micro credit institutions with low interest rate; Government and other development organization should put more effort on supporting micro credit institutions showing interest in environmental activities; undertaking an information campaign to create awareness among the poor on credit issues.

DECLARATION

I, ELIDA NANZALA FUNDI, do hereby declare to the Senate of Sokoine University of Agriculture, that this dissertation is my original work and that it has neither been submitted nor being concurrently submitted for degree award in any other institution.

_____ _____

Elida Nanzala Fundi Date

(MA Candidate)

The above declaration is confirmed

_____ _____

Dr. Mbwambo, J.S Date

(Supervisor)

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This study was inspired by my previous work in Mahale ecosystem, where I observed rural household forced to engage in natural resources destruction due to high incidence of poverty. I was moved by the situation and encouraged to study on how access to financial services can help household to reduce dependency on natural resources and engage in environmental friendly activities.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATION

CGAP	Consultative Groups to Assist Poorest
COCOBA	Community Conservation Banks
DFID	Department for International Development
FAO	Food and Agricultural Organisation
FGD	Focus Group Discussion
HIPC	Highly Indebted Poor Countries
ILO	International Labour Organisation
IUCN	International Union for Conservation of Nature
MEMP	Mahale Ecosystem Management Project
MFIs	Micro Finance Institutions
MMNP	Mahale Mountains National Park
NAPES	National Poverty Eradication Strategy
NGOs	Non Governmental Organisations
TANAPA	Tanzania National Parks
TASEDA	Tanzania Social and Economic Development Agency
URT	United Republic of Tanzania
VSLA	Village Saving and Loan Association

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Micro credit is a concept that has gained widespread acceptance by various development practitioners as an important tool for poverty alleviation. The Grameen Bank in Bangladesh was the first to help people find a way out of the credit trap (Pretty and Hugh, 2001). It helps women to organize into groups and lends to those groups. More than 10 000 micro-lending institutions are today providing loans to over 25 million people throughout the world, most of them are women (Murth, 2008). Reports from 1065 of these institutions revealed that in 2005 there were at least 23.5 million households served by microfinance institutions world- wide, including 18.4 million in Asia, 3.8 million in Africa, and 1.1 million in Latin America (Wydick, 2005). Micro credit institutions provide an alternative source of finance to poor, who are not able to access formal banking services with conditions that cannot be met by poor (Wydick, 2005).

Micro credit in Tanzania is one of the approaches that the government has focused its attention on in recent years in pursuit of its long term vision of providing sustainable financial services to majority of Tanzanian population (URT, 2002b). The government's choice of micro credit institutions was influenced by the conviction that, given adequate attention, microfinance has the potential to contribute considerably to the economic development of the country because it is better adapted to the needs of the low income population which makes up the majority of Tanzania (Rubambey, 2001). Also the potential of microfinance can be harnessed to improve the economic situations of the poor living in biodiversity hotspots so that they are less likely to embark on ever more marginal and environmentally destructive sources of livelihood driven by economic hardship

(Munoz and Christen, 2005). Such institutions include Community Conservation Banks (COCOBA) which was established to compliment governments' effort to rural communities living in biodiversity hotspots to enhance poverty reduction and environmental rehabilitation in different parts of Tanzania.

COCOBA are informal voluntary groups consisting of 30 individuals, established for the purpose of mobilizing savings for lending back to group members. The associations are built on the principle of pooled individual savings as the foundation for building capital with the motivation to save coming from the groups. The group then finance member's income generating activities through loans from the general fund (Wild *et al.*, 2008).

The model also requires members to form groups of five which are charged with the responsibility of loan appraisal and guarantee through joint liability. All borrowers are required to pay an interest against their loan at a rate determined by the members which is usually between 5 and 15%. Groups promote a savings habit or ethic amongst members, train them in financial management and literacy, as well as establishing social funds as a mechanism for micro insurance for health, education needs and environment funds for individual or group environmental projects (MEMP, 2005).

The Mahale Mountains National Park (MMNP) neighboring villages, residents were introduced to COCOBA with the aim of providing financial services, to enable poor households engage or expand their present scope of economic activities and generate employment which leads to MMNP ecosystem conservation (MEMP, 2008). To achieve the anticipated objective, COCOBA group members are involved in saving and credit procedures, operating environmentally compatible income generating activities and

undertaking natural resources conservation activities. Several scientific studies have been conducted to assess the contribution of micro credit institutions in poverty reduction to rural communities in Tanzania (Mtatifikolo, 1994; Machumu, 2001; Likwelile, 2008; Wild *et al.,* 2008). Despite of the contribution of micro credit in poverty reduction little information is documented in protected areas such as Tanzania National Parks. This study will therefore, aims at assessing the achievement of COCOBA in improving rural livelihood and sustainable conservation of Mahale Ecosystem.

1.2 Problem Statement

Kigoma Region is home to the fastest growing human population in Tanzania with the population growth rate 4.8%, compared to the national average of 2.9% (URT, 2002a). Also the region ranks among the most deprived category among all the Tanzania regions. MMNP villages are located in Kigoma rural, according to literature 37.6% of rural Tanzanian is living below the basic needs poverty line (URT, 2002b). In attempting to reduce poverty among MMNP adjacent rural poor community, the Mahale Ecosystem Management Project (MEMP) introduced the COCOBA model in 2004 aiming provide financial services, to enable poor households engage or expand their present scope of economic activities and generate employment which leads to MMNP ecosystem conservation. Currently, COCOBA provide services to more than 900 people in the study area (MEMP, 2008).

Several scientific studies have been conducted to assess the contribution of micro credit institutions in poverty reduction to rural communities in Tanzania Tanzania (Mtatifikolo, 1994; Machumu, 2001; Likwelile, 2008; Wild *et al.,* 2008). Despite of the contribution of micro credit in poverty reduction and environmental conservation little information is documented in protected areas such as Tanzania National Parks. This study will therefore,

aims at assessing the achievement of COCOBA in improving rural livelihood and sustainable conservation of Mahale Ecosystem.

1.3 Justification

Tanzania National Parks Authority (TANAPA) policy recognizes that wildlife conservation and management can no longer disregard interests of rural communities, especially adjacent to protected areas. In realization of this MMNP (an implementing partner of MEMP) established COCOBA to respond as an alternative to the improvement of rural livelihood of the community living adjacent to the protected area and conserving environment (Harrison, 2007). The information generated by this study will help COCOBA as a model to be replicated in protected areas such as other Tanzania National Parks, Game reserved, Ngorongoro Conservation Area Authority, Forest and Marine Reserves.

Also the findings will be essential to MMNP community members to realise the importance of access to financial services to their area and how credits can be efficient and effectively utilized for the benefit of their well being. The study is in line with the Millennium Development goals of reducing abject poverty by 50% in 2015, Tanzania Development Vision 2025 which intends to eradicate poverty and hunger by creating employment opportunities, facilitating increase in productivity in the agriculture sector and diversification of national income, promote gender inequality and empowerment of women (URT, 2000). Furthermore, vision 2025 aims to ensure environmental sustainability and develop a global partnership for development of all these to be achieved with respect to economic growth and poverty eradication by the year 2025. To implement vision 2025, the government formulated the National Poverty Eradication Strategy (NPES), which provided overall guidance and framework for coordinating and supervising

the implementation of policies and strategies of poverty eradication. The poverty reduction strategy paper (PRSP) of 2000 was formulated as a medium term strategy of Poverty reduction in the context of enhanced highly Indebted Poor Countries (HIPC) initiative (URT, 2005). The paper focuses on four critical dimensions of poverty: reducing income poverty, improving human capabilities, survival and social well-being and containing extreme vulnerability among the poor in the sense of managing risk to shocks and stress among others (Likwelile, 2008).

1.4 Objective of the Study

1.4.1 Overall objective

To assess the achievement of Community Conservation Banks (COCOBA) in improving rural livelihoods and sustainable conservation of the Mahale Ecosystem.

1.4.2 Specific objective

i. To document socio-economic activities undertaken by COCOBA groups members and others in the study area
ii. To determine the performance of COCOBA on the supported socio-economic activities
iii. To determine the contribution of COCOBA to livelihood improvement
iv. To determine the participation of local community in environmental conservation in relation to COCOBA

1.5 Research Questions

i. What are the socio-economic activities being undertaken by the communities living in Mahale Ecosystem
ii. Are the COCOBA objectives fulfilled?

iii. What is the contribution of COCOBA in annual income and assets owned by the household?

iv. What is the contribution of COCOBA to the environmental management?

1.6 Limitation of the Study

The livelihood data were based on memory specifically data on production and income from nonfarm activities of the household. It was difficult for responds to recall and thus more time was consumed in responding to issues. This problem was resolved using additional information obtained from key informants and actual field observation.

1.7 Conceptual Framework

The conceptual framework proposed (fig 1) has been established to show the relationship between research variables. Various socio economic activities including income generating activities depends on the livelihood options at people's disposal. Therefore, the presence of Micro credit Institution can enable those who access the service to increase the opportunities available to them by utilizing the assets to fight poverty while conserving environment. If environmental conservation is ignored in pursuing poverty reduction strategy, then the improvement of rural livelihood is likely not to be achieved sustainable.

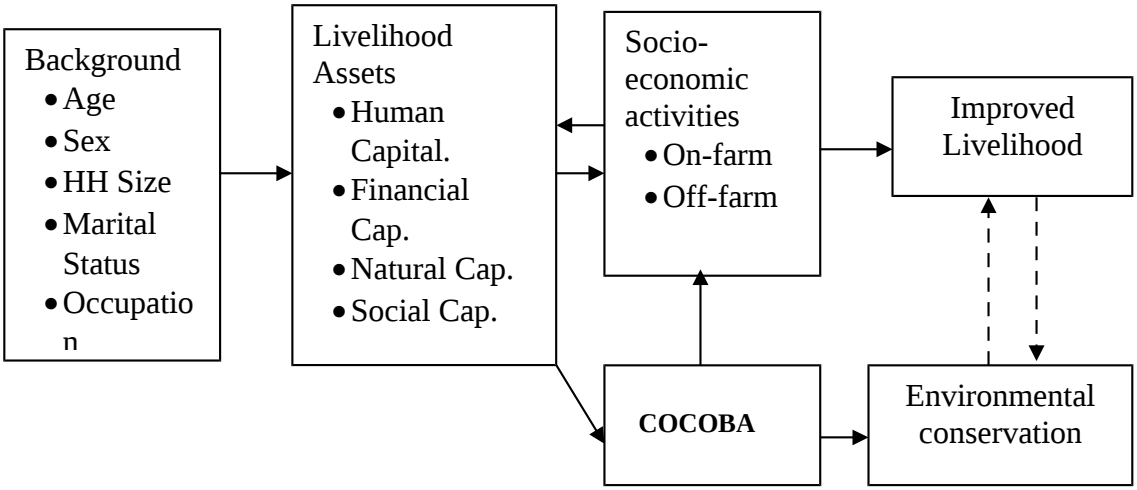

Figure 1: Conceptual framework

Key:

- - - - - - - → Indirect relationship

——————→ Direct relationship

Table 1: Key variables used and its operational definition

Variables	Operational definitions	Indicators	Level of measurement
Age	Total number of years in life	Number of years since a person was born	Ratio
Sex	Human biological differences whether being a man or a woman	Being a male or female	Nominal
Marital status	Current status of marriage for members	Married/Widow/divorce/separated	Nominal
Household size	Social unit of the family including father, mother children and other family members	Number of household members	Ratio
Human Capital	Training provided to an individual	-Number of training attended by an individual	Ratio/interval
Financial Capital	Saving and credit services	Amount of money borrowed and paid back	Ratio
Social Capital	Membership to COCOBA	Whether or not a person is a member of COCOBA	Nominal
Natural capital	The preservation and protection of natural resources	-Number of trees planted in homesteads or on-farms -Number of household with fuel efficient stoves -Number of people participating in Beekeeping activities	Ratio/interval

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Definition of the Key Concepts

2.1.1 Livelihoods

A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: a sustainable livelihood is one which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels in the short and long term (Chambers and Conway, 1991). The livelihoods approach helps the poor to improve their livelihoods by strengthening these five basic assets, and comprises broad and interrelated programs and policies. Microfinance is an important component. The livelihoods approach includes: giving people salaried jobs and opportunities to earn income; providing loans, savings and other financial services; providing training in job and business skills; developing institutions, alliances and networks to advance economic interests; promoting policy and social changes that improve people's livelihood prospects (Aheeyar, 2006).

In this work, livelihood defines as a family's or community's ability to maintain and improve its income, assets and social well-being from year to year. Livelihood activities undertaken by micro-entrepreneurs are shaped by their knowledge, inherent capability and assets. These activities are enhanced by five basic assets with linkage to each other; natural, social, human, physical and financial capital. These assets change over time and differ among households and communities. Access to them is vital for livelihood sustainability and resilience/restoration after a shock.

i) Natural Capital

Natural capital provides communities with the resources they require for their micro-entrepreneur livelihoods. These resources provide a foundation for formal and informal sector economy. In the study area, COCOBA members depend on certain natural resources to meet their daily needs. The influence of natural capital is felt through the correlation between household access to wealth-enhancing assets such as education, finance and through knock–on effect of risk and vulnerability. Also COCOBA members are involving in environmental management through preservation of forest, beekeeping and improved agriculture. Natural capital available in the study area includes; trees and dead wood (Fuel wood, poles, timber, charcoal), forest products (medicine, mushroom, grasses, thatches), water (lake and rivers, fish, sardine, sand), stones, climate and land (Harrison, 2007).

ii) Social Capital

Social capital comprises the social resources (e.g. Network, membership of the group, relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods. This social component is extremely important to COCOBA members and was cited by Wild *et al.* (2007) as more important than the financial gains. Group members often feel to improve social status due to their increased wealth and social interactions that group membership confer. There is evidence of the influence of social capital on accessibility of financial services and increasing a person status in the community (Wild *et al.*, 2007).

iii) Human Capital

Human capital comprises the skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies. For example, provision of training to COCOBA members increases their ability to manage loans as well as their income generating activities, hence contribute to increase productivity. It is considered that, the health status of household members has a significant bearing on their participation

in income generating activities (Luoga, 2008). Also training on environmental conservation influences COCOBA members to engage in environmental management such as tree planting, forest reserve.

iv) Physical capital

Physical capital includes infrastructure such as roads, telecommunications, power and water as are production equipment and buildings that are more likely to be individual owned. The availability of low entry barrier, labour intensive jobs tends to be associated with good infrastructure, high population and market densities which lower the per capital cost of providing infrastructure (Luoga, 2008). Availability of good infrastructure to COCOBA members accelerate trading process and transportation resulting in improving member's micro –enterprises. The findings from the study of Harrison (2007) have shown that, the study area lacks important infrastructure such as roads, communication technologies and there is a shortage of agriculture extensional officers. Transport by boat or lake ferry, bicycle and by foot was common.

v) Financial capital

Financial capital comprises saving whether in cash or in kind, investment and access to credit. In most of rural area, saving is usually in kind, in the form of crops storage, or a bit of cash. Currently, some of community members benefit from saving and credit institutions such as COCOBA operating in rural areas. One of the principle problems for individuals wishing to start a business; whether in the farming or non-farming sector is access to credit. Without start-up funds or with only little cash available for investment, households are limited to a small number of activities which yield poor returns, partly because of the proliferation of similar low entry barrier enterprises.

2.1.2 Micro credit institutions

Micro credit is the provision of a broad range of financial services such as savings, loans, payment services and insurance to poor and low income households which fall just above the nationally defined poverty line and poor individuals which fall below the poverty line, with the goal of creating social value (Mosley, 2001). The creation of social value includes poverty alleviation and the broader impact of improving livelihood opportunities through the provision of capital for micro enterprise, and insurance and savings for risk mitigation and consumption smoothing (Rajat, 2007). Micro credit does not only cover financial services but also non-financial assistance such as training and business advice. Credit has been observed as an important tool for channelling funds in rural and urban development projects. This importance is demonstrated by the many efforts that have been made throughout the developing countries to strengthen credit systems. A credit is expected to enable increases in productivity through increased use of modern inputs and technological packages (Khandker, 1999).

Micro credit is characterized by a range of loan products with short maturities, limited amounts and fixed repayment schedules. These loans are often accessed either as individual or group loans. Individual lending is important to people who have collateral or a good repayment track record. It provides the more developed small-scale enterprises with flexibility to borrow for specific needs as and when they need the resources. Group lending has proved to be a powerful mechanism for reducing risks and transaction costs especially in remote and areas of low population. The group lending methodology has been widely applied in Africa including in the forest sector. It builds on traditional indigenous institutions (Gondo, 2009).

There is a wide range of definitions for micro credits, but for the purpose of this study, micro credit is considered as an important tool to rural community depending on natural resources through provision of loans which are invested in alternative income generating activities with the objective of reducing pressure on natural resources while improving livelihoods. The following section explains on how access to financial services contributes on livelihood improvement.

2.2 Theoretical background on Micro credits and Sustainable Livelihood

The relationship between livelihoods and access to financial services is best explained by the theory of sustainable livelihood framework as explaines by Ashely and Carney (1999) and Scoones (1998). The framework evolved over years as perceptions on poverty reduction, how people live and inclusion of structural institutional issues were changing (Ashley and Carney, 1999). Following the sustainable livelihood approach, it is clear that poor people do not only lack income but face inadequate food, shelter and lack of access to education and health. In this context, they are vulnerable to ill- health, economic displacement and natural disaster (Meyer, 2001).

Furthermore, poor people are prone to Government policies, regulation and actions to which they are powerless to influence. The choices of household livelihood strategies are influenced by the household's level of assets; their access to resources (financial capital, natural capital, human capital and social capital) and the structure and processes within which they operate. According to the sustainable livelihood framework, poor household's access to financial credit and insurance, build up their productive assets and hence improve productivity (Bee, 2007).

ILO (2005) argues that the livelihood approach helps the poor to improve their livelihood by strengthening five basic assets and comprises broad and interrelated programs and policies. Therefore microfinance is an important component in giving people opportunities to earn income, access loans, saving and other financial services, it provides training in job and business skills, developing institutions, alliances and networks to advance economic interest, promoting policy and social changes that improve people's livelihood prospects. The next section looks at Micro credit and its linkage to livelihood and sustainable environment.

2.3 The link between Micro credit, Livelihood and Environment

Micro credit schemes have been initiated to meet different objectives. Among of them are to provide sustainable livelihoods, to revive the local economy and provide a boost to household economy, in order to create the means of achieving high standards and reducing market failure (Rubambey, 2001). It was noted that there is rapid depletion of natural resources in many countries of the world that can be linked with high incidences of poverty; and, that poverty is a deprivation of essential assets and opportunities to which every human is entitled, such as education, healthcare, nutrition, water and sanitation, as well as income, employment and wages (Nishat, 2007). The poor often rely on variety of natural resources and ecosystem services as a direct source of livelihood. Natural resources can be a primary source of livelihood or may supplement a household's daily needs and income. A growing body of research shows that poor rural households often derive a significant share of their income from natural resources. Poor people are affected by natural resource degradation and biodiversity loss much more than the better off because of their limited assets and their greater dependence on common property resources for their livelihoods (Munoz and Christen, 2005).

However, most country's poverty alleviation strategies fail to recognize the importance of the environment as a sector, taking it only into account as a cross-cutting issue such as environmental health or environmental education. In practice this means missing a golden opportunity to use the only asset that is readily available to the poor, but which they are often unable to exploit productively and sustainably due to legal, technical and other constraints. Thus a resolution adopted by IUCN and IUCN members would be to address poverty simultaneously with environmental rehabilitation and design projects so as to reflect both environmental rehabilitation and poverty alleviation simultaneously (Nishat, 2007).

Currently, some of the countries have been started to integrate environmental conservation components in micro credit institution as a strategy of fighting poverty and reducing conflict with natural resources use (Wild *et al.*, 2007). Micro-credit is a vulnerability reduction mechanism; it can help cushion the effects of economic shocks that may otherwise drive rural community to environmentally destruction. Also Micro credit is relevant in improving the income generation and diversification strategies of the poor, especially when those communities have economic opportunities that are capital-constrained (Munoz and Christen, 2005). The next section reviewed the linkage between micro credit, livelihood and environmental conservation worldwide.

2.3.1 Review on Micro credit, Livelihood and Environment Worldwide

Studies on micro credit institutions have been conducted in various countries all over the World. The findings from these studies indicated valuable evidence showing its effectiveness in preserving a sustainable livelihood and environment. Mosley (2001) in a comprehensive study on the use of micro finance to combat poverty, argue that well-designed programmes can improve the incomes of the poor and can improve people's livelihood. They state that "there is clear evidence that the impact of a loan on a

borrower's income is related to the level of income" as those with higher incomes have a greater range of investment opportunities and so credit schemes are more likely to benefit the "middle and upper poor". They also show that when loans are associated with an increase in assets, when borrowers are encouraged to invest in low-risk income generating activities and when the very poor are encouraged to save; the vulnerability of the very poor is reduced and their livelihood improves (Mosley, 2001).

Access to Microfinance institution can empower women to become more confident, more assertive, more likely to take part in family and community decisions and better able to confront gender. Also microfinance projects proven to reduce the isolation of women as when they come together in groups they have an opportunity to share information and discuss ideas and develop a bond that wasn't there previously (Meyer, 2003).

Kantor (2009) in his study From access to impact: Microcredit and rural livelihoods in rural Afghanistan. The study aimed to assess impact of micro credits effect on existing informal credit system and livelihoods in rural Afghanistan. The study found that providing access to credit is not sufficient to ensure positive impacts on client livelihood security or MFI viability. Clients often prioritized microcredit repayment over repaying informal credit, incurring considerable cost; also the studied villages did not have activities that were profitable enough for clients to easily repay microcredit.

Munoz and Christen (2005) in their paper 'Microfinance in hot spots for the Protection of Biodiversity' argued that microfinance can contribute to a triple bottom line by promoting the sustainable use of natural resources, sustainable livelihoods for the poor living in and around biodiversity hotspots, sustainable financial institutions that can service the poor in the long term.

Although many biodiversity projects have incorporated some sort of credit component into their operations, its role has been limited to the finance of particular inputs or equipment, or in support of new biodiversity based enterprises. Furthermore, many organizations implementing micro credit activities lack the requisite experience base in finance to attain high levels of loan repayments and achieve financial sustainability. Poor clients are far more likely to invest in their own future if they feel that they have long-term interest (Wild et *al.,* 2007). The next section presents different findings of Micro credit, livelihood and environment in Africa.

2.3.2 Review on micro credit, livelihood and environment in Africa

Since the mid 1980s most countries in Sub-Saharan Africa have adopted and promoted community-based forest management approaches that are aimed at meeting both conservation and development goals through the participation of local communities in the management of their forest resources (Gondo, 2009). Policy and legal changes in recent years have helped to accelerate decentralization and devolution of forest management (Kingazi, 2002). The approaches incorporate a wide variety of economic measures aimed at improving community livelihoods whilst providing incentives for the sustainable management, conservation and utilization of the forest resources.

The provision of microfinance to poor rural communities for forestry activities faces a number of challenges. The long rotation period causes investment uncertainties because of biological and market risks that may negatively affect final returns on the investment. The high start-up costs in forest management and some enterprises do not attract micro-finance support especially when there is no collateral (Gondo, 2009). An important challenge in most developing countries, especially in Africa, is insecure tenure. Most natural forests are communally owned or owned by the state. This does not provide adequate guarantee that

the raw materials derived from them will continue to be available to the same forest users making enterprises based on such resources unattractive to micro credit.

In many countries a major limitation is the unavailability of microfinance as most banks and other formal micro financing institutions still insist on collateral and do not have targeted forestry financing. Some low income rural communities are also discouraged from accessing microcredit from formal institutions because of low educational levels, slow release of funds and less exposure to paperwork and banking procedures (Gondo, 2009).

2.3.3 Review on micro credit, livelihood and environment in Tanzania

In conflict situation, Micro credit approach has been proven to play a significant role in improving refugees' livelihood as shown in Katumba camp in Rukwa region. The importance of supporting micro-economic activities through loans or grants in conflict-affected areas is to enable people to survive and to build inter-communal relationships that work towards conflict management and reduction. By supporting livelihoods, humanitarian aid can increase human security. Also Micro credit programs that support refugees' livelihoods have great potential for offsetting some of the economic burden to the host communities imposed by refuges (Jacobsen, 2001).

Torell *et al.* (2007) in their study Integrated Coastal Management, Livelihood Development and Micro-Loan Strategies in Bagamoyo Tanzania. The study analyses a microcredit scheme for small-scale enterprises. The study found out that Women, who are often hailed as the best credit performers, commonly develop microenterprises based on survival activities that are seasonal, providing secondary sources of income. Survival activities are often the only choice for the most poor, living in remote and resource

deficient regions that lack infrastructure and market access. One limitation with survival activities is that the income is most often used for immediate consumption instead of being reinvested into the enterprise. Hence, it helps the borrower “survive” but not necessarily gain a higher standard of living (Torell, 2007).

However, many of the impacts on income were positive for the less poor and negative for the poorer clients, this indicated that poorer clients are more risk adverse and less likely to invest in fixed capital and so are more vulnerable to having to sell productive assets in the event of a shock (Marconi and Mosley, 2004).

Furthermore, many rural development projects incorporate micro financing components for supporting poor families. In the forest sector several forest development projects by government and NGOs incorporate micro financing. These usually consist of grants and loans for supporting activities such as acquisition of planting materials, procurement of raw materials, restoration of degraded watersheds and environmental protection (Lalika, 2006). The study by Butuyuyu (2003) indicated that tangible incentive in form of free tree seedling significantly influenced the number of trees planted in Same district.

From the above evidence the researcher found that most of studies are concentrating on micro credit and poverty while few basing on linking micro credit, livelihood and environmental component. Therefore, there was a need to study COCOBA scheme implemented in Mahale area and see to what extent their objective of improving rural livelihood and environmental conservation has been achieved. The next section provide an in depth explanations of COCOBA model.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Overview

This chapter presents the methodology used in this study. Section one covers the description of the study area; section two presents research design; section three presents sampling procedure and sample size; section four presents data collection methods and section five describes data analysis techniques.

3.2 Description of the Study Area and its Characteristics

The study was conducted in Buhingu Division of Kigoma District to the villages located adjacent to Mahale Mountains National Park (MMNP). MMNP and surrounding villages are situated on Lake Tanganyika in Western Tanzania, 120 km South of Kigoma. MMNP lies between 6°10'S, 29°50'E. The Mahale Mountains run in a 50 km chain parallel to Lake Tanganyika, rising steeply from an altitude of 780m above sea level from the lake's waters and shores. The area receives an average of 600 – 1000 mm of rainfall per annum (MEMP, 2008).

This study was conducted in 3 villages, selected from 3 wards of Buhingu Division which are closely bordering Mahale Mountains National Park (Harrison, 2007). According to population census of 2002, population estimates for the three wards selected are Buhingu 13 260, Kalya 11 894 and Igalula 15 165 making the total of 40 319. The inhabitants of the area are Tongwe, Bembe, Ha, Fipa and Sukuma who immigrated to the area searching for favourable fishing grounds, farmland, and pastures or fleeing armed conflict in neighbouring countries. The main livelihood activities are fishing, agriculture, livestock keeping and palm oil extraction. Mahale is an extremely remote area in Tanzania and even

today, there is still no road access to the area. The main transports in the area are an old German steamer ferry famous as Liemba and local wooden boats. The establishment of Community Conservation Banks (COCOBA) as a pilot project to the area and proximity of selected villages to Mahale Mountains National Park were the criteria for the selection of the study villages. Also the area is one of the poorest by most indicators of wellbeing with per capital income of Tshs. 125 593 in 2002, being lower than national average which was Tshs 256 608 in the same year (URT, 2003). According to National Bureau of statistics survey (2002b) Kigoma, Lindi and Shinyanga have over 80% of people living in the poor household compared to the rest of regions in the country. The research designed used in this study was presented in the next section.

3.3 Research Design

The study used cross-section research design, which is the most common method in survey research as allows data to be collected at a single point in time (Bailey, 1994). The design is suitable for descriptive analysis and for determining relationships between and among variables focused at the time of the study.

3.4 Sampling Procedure and Sample Size

The study population consisted of households bordering MMNP particularly in those villages working with COCOBA model in Buhingu Division. One Division and three wards were purposively selected. Using simple randomly sampling three villages were selected, one from each ward. The total sample size of 120 was selected, whereby 60 respondents were COCOBA members and 60 non COCOBA members. Members were randomly picked from MEMP register book in which all COCOBA members were listed according to their respective villages. The names of Non- COCOBA members were recorded with the assistance of village leaders from each sampled village and random

selection was employed so as to reduce bias. A minimum of 40 households were interviewed in each sampled village whereby 20 respondents were COCOBA members and 20 non-COCOBA members. Five key informants were MEMP officials District and village leaders. These respondents were purposively selected from three wards of Buhingu, Kalya and Igalula to give relevant information due to their professional working experience and give their views on COCOBA operation. Purposive sampling was also used to select respondents for a Focus Group Discussion. There were 4 groups (women and men groups of COCOBA members and non COCOBA members) in every sampled village, and each group consist 8 respondents. A total of 12 Focus group discussions were held in the study area.

Table 2: Distribution of respondents in the surveyed villages in Buhingu Division

Ward	Respondents			
	Village	COCOBA members	Non members	Total
Buhingu	Nkonkwa	20	20	40
Igalula	Igalula	20	20	40
Kalya	Sibwesa	20	20	40

3.5 Reconnaissance Survey

A reconnaissance survey was conducted in Buhingu Village so as to provide a general picture of the research area and to pre test the questionnaire for the main study. Ten households were visited and necessary modification was done to questionnaires to suit the prevailing local condition. The reason for pre testing the questionnaires was to ensure that items in the questionnaire are stated clearly and have the same meaning to all respondents (Mugenda, 2003). During the reconnaissance survey, key issues including saving and credits, social economic activities, farming system and people environment interaction was given special attention.

3.6 Data Collection Methods

3.6.1 Data collection method for objective one

Objective number one aimed to document socio-economic activities undertaken in the study area. Specific research question that guided this investigation was; what are the socio economic activities undertaken by community living in Mahale Ecosystem. Information for this objective was obtained using questionnaire survey with COCOBA beneficiaries and non-beneficiaries as described in the next section. Questionnaire survey also covered issues related to objective two, three and four.

3.6.1.1 Questionnaire design

A household structured questionnaire with closed and open ended questions was used to collect primary data from the respondents (Appendix 1). A total number of 120 respondents of COCOBA members and non members were interviewed. In using the questionnaire, the emphasis was placed on the collection of information related to livelihood improvement and environmental management as means of improving peoples' standard of living. The questionnaire was divided into four important sections. The first section was designed to solicit background information from the respondents including; household profile, household resources ownership, crop and livestock production system. The second section of the questionnaire dealt with the collection of COCOBA information and related aspect which conducted only to COCOBA beneficiaries. The following section was designed to find out on household standard of living by looking on asset ownership and type of house a respondent reside and last section looks on how the community participate in environmental management in regard to COCOBA.

3.6.2 Data collection method for objective two

The second objective was to determine the performance of COCOBA program on the supported activities. The intention of this objective is to understand on how COCOBA model worked and support livelihood activities. This objective was steered by research question that; are the COCOBA objective fulfilled. This question was answered by the employment of Questionnaire survey, Key informant and Focus Group Discussion with COCOBA beneficiaries only. Focus group discussion also covered the issues related to objective three and four as described on the next section.

3.6.2.1 Focus group discussion

Focus group discussion (Appendix 3) was employed prior to questionnaire survey to learn about rural conditions in an intensive and interactive manner. Focus Group Discussion was purposively chosen so as to explore information from people of different age, sex and occupation. As a research tool, FGD serves the purpose of opening up discussion with villagers on a particular topic of interest (Kessy, 1995).

3.6.2.2 Key informant

A checklist was prepared to solicit information from key informants (Appendix 4). A key informant is an individual who is knowledgeable, accessible and willing to talk about the issue under study (Mbwambo, 2000). Key informants in this study included District development officer, MEMP officers, Ward officers, Village leaders, village elders, village environmental committee members were consulted to obtain more information about the study area. Two trained assistant researchers assisted the researcher to administer interview.

3.6.3 Data collection method for objective three

The objective number three of the study focused on determination of COCOBA in improving rural livelihood. The intention of this study was to understand on how COCOBA model helped improve the lives of the intended beneficiaries. Specific research question that guided data collection for this objective was; what is the contribution of COCOBA in annual income and assets owned by household. Information for this objective was obtained through questionnaire survey with COCOBA beneficiaries and non beneficiaries, Focus group discussion and Key informant.

3.6.4 Data collection method for objective four

Objective number four focused on determining the participation of local community in environmental conservation in relation to COCOBA. This objective was guided by specific research question; what is the contribution of COCOBA in environment management. The information for this question was answered by the employment of in depth interviews with COCOBA beneficiaries and non beneficiaries, Focus group discussion and key informant as described in section two and three above.

3.6.5 Secondary data collection

Secondary data were collected from relevant documents including books, journals, official reports and statistical reports from Sokoine National Agriculture Library, Government documents, records and references related to the study from Mahale Mountains National Park, MEMP, internet, District and village offices for the purpose of enriching the primary data sources. The next section presents methods of data analysis used in this study.

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3.7 Data Analysis

Data analysis followed a two pronged approach by making use of both qualitative and quantitative methods. The data was collected and summarized in a database templates containing variables identified. Next section presents methods of data analysis used in this study.

3.7.1 Method of data analysis for objective one

Data obtained in this objective was analysed by using SPSS computer software. In this analysis frequency table, cross tabulation and histogram were presented to show socio-economic activities undertaken in the study between COCOBA members and non members.

3.7.2 Method of data analysis for objective two

Quantitative data in this objective were analysed using SPSS computer software. Frequency tables, cross tabulation were presented to understand how COCOBA program worked and to what extent COCOBA have helped improve the lives of the intended beneficiaries. Qualitative data obtained in this objective were analysed using “Content and Structural-Function Analysis” techniques. Content analysis was used to analyze the components of information collected through verbal discussion with Focus group discussion and Key informants. According to Kajembe (1994), the information collected through verbal discussion with key informants and Focus group discussion is broken down into smallest meaningful units of information and tendencies to get a set of categories that represent research findings.

3.7.3 Method of data analysis for objective three

Quantitative and qualitative data were used in analysing this objective. Quantitative data were analysed by using SPSS computer software whereby; assets value and annual income

of the respondent were calculated to get the total value of assets owned and annual income obtained respectively. Pearson's Chi-square was employed to test the hypothesis that there is no significant difference in terms of assets ownership like furniture, utensil, transportation and durable assets between members and non members. Also T-test was employed to test the hypothesis that there is no significant difference on the mean annual income average between members and non members in the study area. Qualitative data were analysed using Content and Structural-Function Analysis as described in section 3.7.2.

3.7.4 Method of data analysis for objective four

Some quantitative analysis was done in assessing the influence of socio-economic characteristics on number of tree planted using linear regression model. Multiple regression models were developed to show the relationship between dependent variable (Number of trees planted) and independent variables (age, education level, farm size owned, farm size used, household size, household labour, income level, supply of free tree seedling and distance of residence from MMNP)

The multiple regression equations developed is given by:

$Y = \beta_0+\beta_1X_1 +\beta_2X_2+ \beta_3X_3 + \beta_4X_4 + \beta_5X_5\ldots\ldots\ldots..\beta_nX_n + \varepsilon$

Where:

Y = Total number of trees planted

X_1 to X_n = Independent variables

β_0 = a constant showing intercept for regression equation

β_1 to β_n = independent variables coefficients

ε = error term

i = 1,2,3…..n

n = Sample size (total number of respondents i.e 120 for the purpose of this study). H_o: $\beta_1 = 0$ that is regression coefficients are equal to zero implying that social economic characteristics (independent variables) have no significant contribution on tree planting ($P<0.05$). H_a: $\beta_1 \neq 0$ the is regression coefficients are not equal t zero meaning that social economic characteristics have significant contribution on the number of tree planted ($P< 0.005$). The regression model was applied to explain the relationship between social economic characteristics and number of trees planted in the study villages. From the above the variables included in the regression model were:-

X_1 = Age of the respondent

It was hypothesized that middle and old age respondents are more likely to engage in tree planting activities than young ones. This means, these groups have adequate local knowledge and awareness on the importance of biodiversity and other natural resources as well as the mechanism leading to sustainable conservation. For this reasons they are willing to participate in tree planting compared to their counterpart. The expected sign of the regression coefficient was positive (+).

X_2 = Household size

The hypothesis in this case was that the bigger the household, the more labour would be available in the household for tree planting, resulting into high number of trees planted by the household. The expected sign of regression coefficient was positive (+).

X_3 = Education level

It was hypothesized that higher levels of education would influence respondents to plant more trees than their counterpart. It was assumed that, higher levels of education of the household head tend to increase people's awareness on the importance of natural resources conservation for sustainable use and also increase their willingness to participate in conservation activities such as tree planting. Therefore respondents with a higher education level would plant more tree than illiterate ones. The expected sign of regression coefficient was positive (+).

X_4 = Farm size owned

The hypothesis in this case was that the bigger the size of the farm, the more the space would be available for tree planting, resulting into high number of trees planted. It was hypothesized that, the large the farm size, more trees would be planted. The expected sign of regression coefficient was positive (+) implying that increases in size of household farm would increase the number of trees planted.

X_6 = Labour in farm

This could have a positive co-efficient in the sense that, the bigger the number of people working in the farm, the high number of tree is likely to be planted with the household. The expected sign of regression coefficient was positive (+) implying that increases in size of labour working in farm would increase the number of trees planted

X_7 = Household income

It was hypothesized that households with relatively higher income could plant more trees than those with low income. This based on the fact that high-income earners have greater potential to purchase planting materials such as seedling, tube and hiring labour. The implication could be more trees could be planted and well managed. The expected sign of regression coefficient was positive (+).

X_8 = Supply of free tree seedling

It was hypothesized that free tree seedling influence respondents to plant more trees. The reason behind this is that rural communities have little financial and material resources for preparing their own nurseries. Therefore supplies of free tree seedling tend to influence many people to plant trees. The supply of free tree seedling was coded with regard to institutions provided those trees.

X_9 = Distance of residence from the National Park

It was assumed that, the distance a respondent resides from the National park would influence the number of tree planted. It is assumed that individuals that reside far from the park are faced with higher environmental destruction problems due to unsustainable use of land for agriculture activities, charcoal making and lumbering which leads to inaccessibility of most of natural resources benefits. Therefore respondents who reside far from the park are more likely to participate in tree planting in order to meet their basic demands. An individual who resides close to the park have low incentives in implementing conservation activities such as tree planting. The expected sign of the regression coefficient was positive (+).

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1. Overview

This chapter presents and discusses findings of the present study conducted in three wards in Buhingu Division in Kigoma District. This chapter has five section whereby section one covers the general characteristics of the study population; section two presents local people's socio-economic activities carried out in the study villages; section three presents performance of COCOBA on socio economic activities; section four presents contribution of COCOBA in community livelihood and section five presents local community participation in conservation activities.

4.2 General Characteristics of the Study Population

This section presents the demographic and socio economic characteristics of 120 household randomly selected from the study population as presented in Table 3.

4.1.1 Age characteristics

Age is an important variable because it determines the period of migration and entry into production process and other activities. The selected sample of the study population comprised 60 COCOBA members and 60 non members of both sex. The majority of the respondents (75% of COCOBA members and 75% of non members) were between the age of 26 and 45 years as presented in Table 3. This implies that the majority of respondents are mature people who were still energetic and able to play a significant role in production process and environmental conservation, this was confirmed by the mean age of 34.4 of the respondents. This middle age group is mostly responsible for economic activities as supported by Mwailafu (2007) that in Tanzania the economically productive class ranges between the ages of 15 to 64 years. Age was thought to be a factor that might influence the use of credit because it is believed that the old and young age groups have less access to credit. This means children and old people may not be granted access to loan because they tend to be less active in economic activities than those of the middle age.

Table 3: Demographic and socioeconomic characteristics of the respondents

Characteristics	COCOBA members		Non COCOBA members	
	N	%	N	%
Age of the respondents				
18 – 25 yrs	7	11.7	11	15
26 – 35yrs	25	41.7	29	48.5
36 – 45yrs	20	33.3	16	26.7
46 – 55 yrs	7	11.7	3	5
>= 56	1	1.7	1	1.7
Marital status				
Single	3	5	9	15
Married	51	85	40	66.7
Widower	3	5	4	6.7
Divorced	2	3.3	2	3.3
Separated	1	1.7	5	8.3
Years in school				
No formal education	6	10	10	16.7
Primary education	48	80	46	76.7
Secondary education	4	6.7	4	6.7

Further education (college)	2	3.3	0	0
Household size				
<= 2	4	6.7	5	8.3
3 - 5	36	60	38	63.3
6 -9	18	30	16	26.7
>=10	2	3.3	1	1.7
Household labour				
1	4	6.7	9	15
2	41	68.3	43	71.7
3	12	20	6	10
4	2	3.3	2	3.3
5	1	1.7	0	0
Farm size owned				
>= 1 acre	15	25	24	40
1.1 to 3 acres	36	60	29	48.3
3.1 to 5 acres	9	15	7	11.7
Distance to MMNP				
30min to 1hr	15	25	4	6.7
2hrs to 3hr	26	43.3	25	41.7
4hrs to 5 hrs	19	31.7	31	51.7

The age of the respondents ranged between 18 and 56 years as shown in Fig 2. A chi – square test was used to determine the association of age between COCOBA members and non members. The results obtained (chi-square of 3.230 and P=0.520) indicated that there is no significance association of age between COCOBA members and non members.

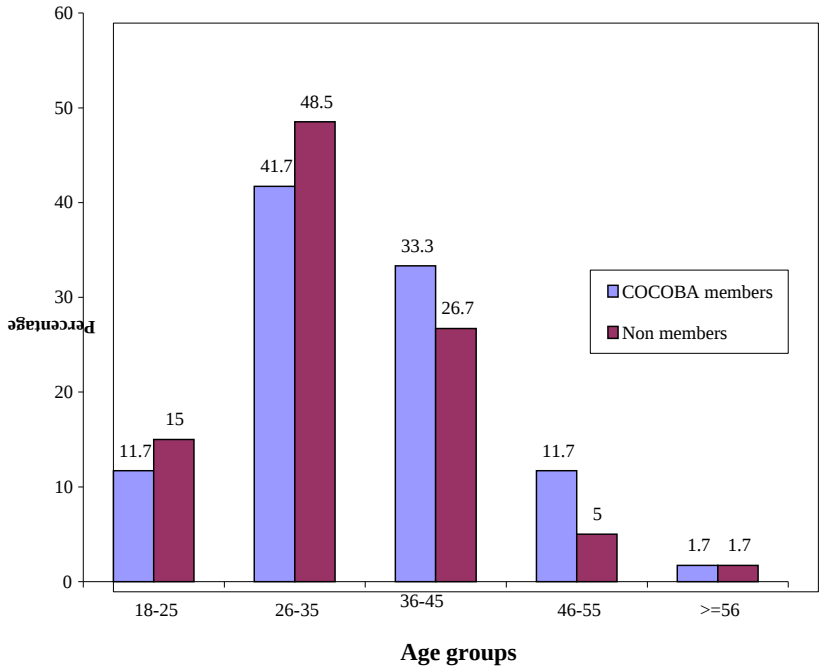

Figure 2: Age of the respondents

4.1.2 Marital status

The majority of members of household engaged in COCOBA groups and non members were married. About 85% out of COCOBA members were married while 66.7% of non members were married too as presented in Fig. 3.

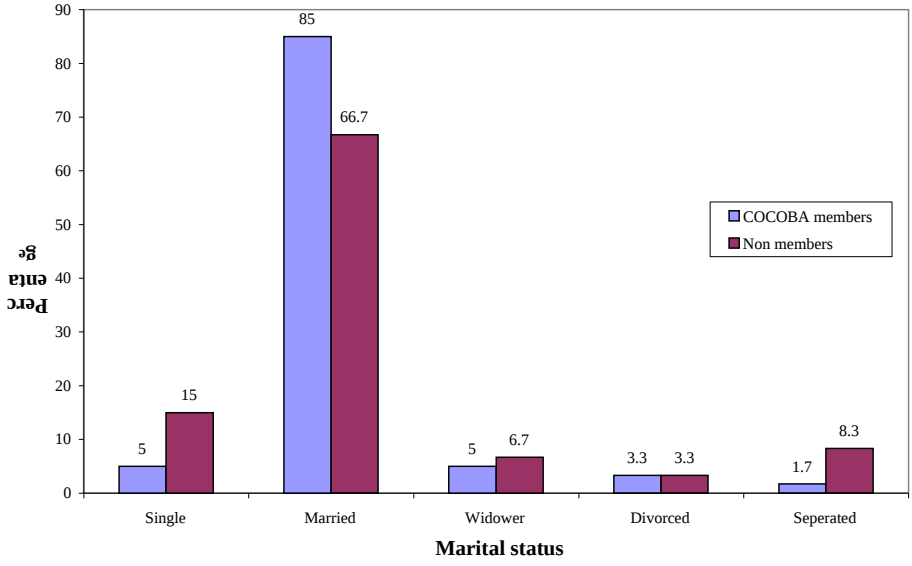

Figure 3: Marital Status of the respondents

Marriage in rural areas like Buhingu division is almost universal as it confirms the legitimacy of children; also marriage has great influence on family matters since parents are forced to engage in lending institutions to access loan so as to expand or improve income generating activities to meet family need. Chi-square was run to determine the association between COCOBA members and non members on marital status component. The results shown that there is no association $P>0.05$ between marital status of COCOBA members and non members on accessibility of credits and environmental conservation. This means that, the status of marriage does not have any connection with being a COCOBA member or participating in environmental activities.

4.1.3 Education status

In most developing countries education is the most important tool for liberating people from poverty. Essentially this is the main reason that most household spend a lot of money to educate their children, so that they can liberate themselves from poverty or peasant life. It is also used as a survival strategy, by selecting a few members of the household to seek formal employment in the modern sector. Respondents were grouped into five categories with respect to education background as shown in Fig. 4.

The findings indicated that more than 76% of member respondents have primary education and 9% of respondents completed secondary and further education. This means that there were relatively very few secondary and college graduates in the selected sample. This situation may be due to remote, rural geographical nature of the study area in which secondary education services are limited. There were two secondary school in the study area, one in each ward and were established from 2003 when majority of the respondents were not in the position to join. In normal expectation many of higher education graduates are rarely found in rural areas. It was also observed that 14.2% of respondents interviewed had never attended formal education as shown in Fig. 4.

A chi square- test was run to determine the difference between members and non members on education level and credit accessibility and environmental conservation. The findings revealed that there is no significant difference ($p > 0.05$) of education level between members and non members on credit accessibility and environmental conservation. That means, education level of a person is not a criteria for accessing credit in COCOBA groups or participating in environmental conservation activities. Every person, regardless of his/her education level is allowed to join COCOBA and have the access of credit as well as participating in environmental conservation activities.

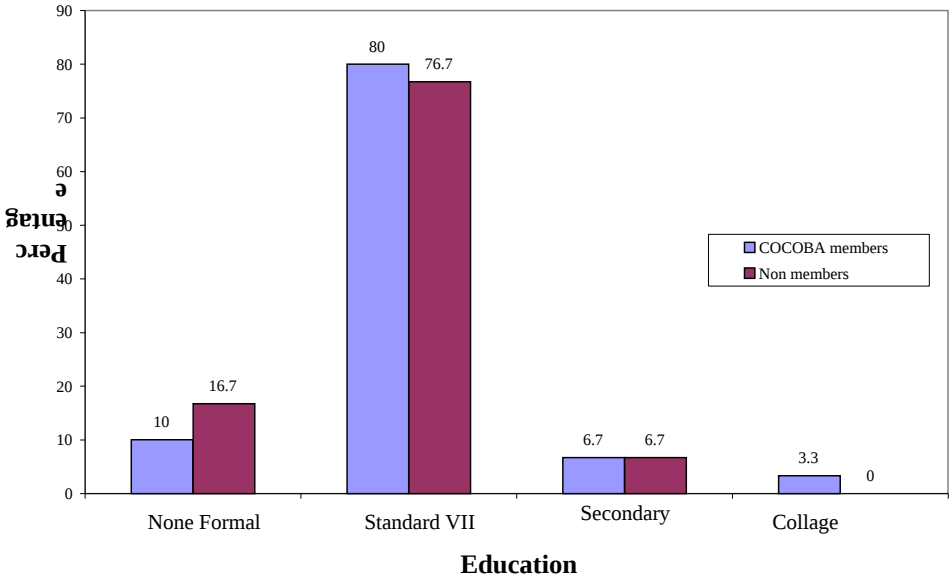

Figure 4: Distribution of respondents by years in school

Even though the level of education in the area is still low, since most of respondents had only finished school at standard seven, they know how to read and write. Such consideration is an important input which may enable local people to act upon new ideas and initiatives hence creating necessary strategies for fighting poverty and environment destruction. These findings correspond with results reported by Lalika (2006) who noted that knowing how to read and write was sufficient in adoption of technologies whose dissemination demand simple leaflets, pamphlets, posters, newspaper or other written materials. The impact of education on livelihood and environment is that most of the uneducated people often struggle to act on new ideas such as joining micro credit institution such as COCOBA and implementing some environmental conservation initiatives such as tree planting programme, beekeeping activities and uses of improved stoves. However some low income rural communities are discouraged from accessing micro credit from formal institutions because of low educational levels, slow release of funds and less exposure to paperwork and banking procedures and limited knowledge about accounting, financial analysis and banking procedures inhibits the access of smallholders to credit (Gondo, 2009).

4.1.4 Household size

In order to examine this variable the respondents were asked to indicate the number of household members. The household composition considered in this study were the residential groups whose members live together in close contact by sharing resources such as accommodation, farmland and foodstuffs. The results revealed that majority of COCOBA member respondents (60%) had a family between 3 - 5 members. Member respondents with family size <2 members were 6.7% while member respondents with family consisting of 6-9 members were 30%. Also it was found that the family with members more than 10 was 3%. Nevertheless the field results reveal that 63% of non member respondents had family size of 3- 5 people while 27% of non member respondents had a family size of 6 - 9 members (Fig. 5).

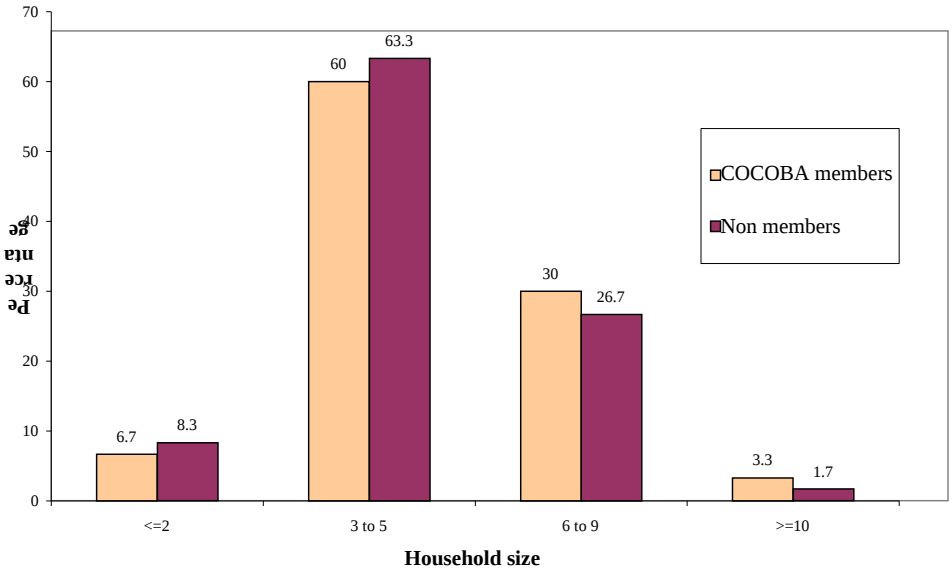

Figure 5: Distribution of the respondents by household size

And one non member respondent had a family of more than 10 members which was 2%. The majority of both members and non members interviewed, considered a family of at least 5 members or below to be a small family, while a family of 6 - 10 members or above was considered to be a large family. It is widely observed that poor household tend to be larger than richer household. The larger the size of families the greater was likely to be poor. Large household size may be attributed by extended family relationship and the tendency of adult sons and daughter (unmarried or married) to remain in the parental household (Mbwambo, 2007). According to URT (2002b) skewed household size can be an impoverishing force particularly when it indicates a significant dependency ratio that overburden the household head.

The number of people in a household has an influence on income stabilization of household. Larger household size reflects demand for funds to meet family financial obligations and sometimes hinders the expansion of business because income generated by the business is used at home to sustain family needs hence it reduces the capacity of a household to invest. Exceptions are possible in cases where most of the family members supply labour power and contribute to the income of household, these may be better off than larger household with many dependants.

In the case of environmental conservation, a household with a big size number of people tend to engage in environment conservation activities than those of small size (Gondo, 2008). Thus, the household size was then anticipated to be one of the social-economic factors that discriminate members and non-members on the use of credit and environmental conservation in this study. The results from Chi-square test analysis indicated that there is statistically significant ($p< 0.05$) positive association between household size and number of tree planted with Chi-square of 0.047. This implies that the

increase of household size led to the increase of number of trees planted by the household. That means there are enough people in the family to provide labour power for production and other development activities such as participating in environmental activities.

4.1.5 Household labour

This variable is very important in determining the labour force engaging in household production. Labour force in this study was determined based on the age of 18 and above as supported by Tanzania labour law act of 1999. The larger the number of people working in the farm increases the size of the farm cultivated as well as increasing production. Also members of household are likely to engage in other income generating activities compared to the household with small size. During the study respondents were asked to indicate the number of people participating in food production, the results indicated that majority of respondents 68.3% of COCOBA members and 72% of non members had a labour force of 2 people. This result implies that, majority of the household interviewed had more dependent groups like children and elderly people than working age group. COCOBA member respondents with the labour force of 3 people were 20% while non member respondents with the same number were 10%. Also findings revealed that member respondents with labour force between 4 –5 labour forces were 5% while non member respondents were 3.3% as presented in Fig. 6.

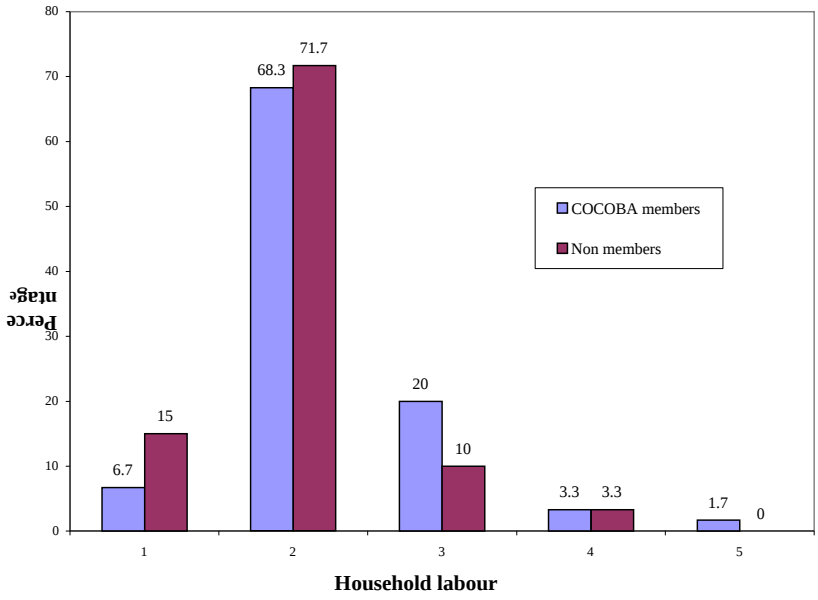

Figure 6: Distribution of respondents by household labour

4.1.6 Farm size

Land is one of the most important determinant factors in sustainable resources management. With enough land, people may have opportunities to cultivate a variety of food and cash crops while carrying out conservation activities such as tree planting which in turn protects environment (Lalika, 2006). Farmers with land size available only for agriculture crops are normally reluctant to engage in environmental activities like tree planting. The study found a significant difference between land owned by the household and the actual size used for farming. The average land owned was 1.89 acres while the average actual land size used for farming was 1.54. It was noted that majority of COCOBA members 60% (Fig. 7) own between 1.1 to 3 acres of land while their counterpart own nothing. This might be contributed to the fact that sometimes COCOBA members are required to have land as guarantor when taking the loan.

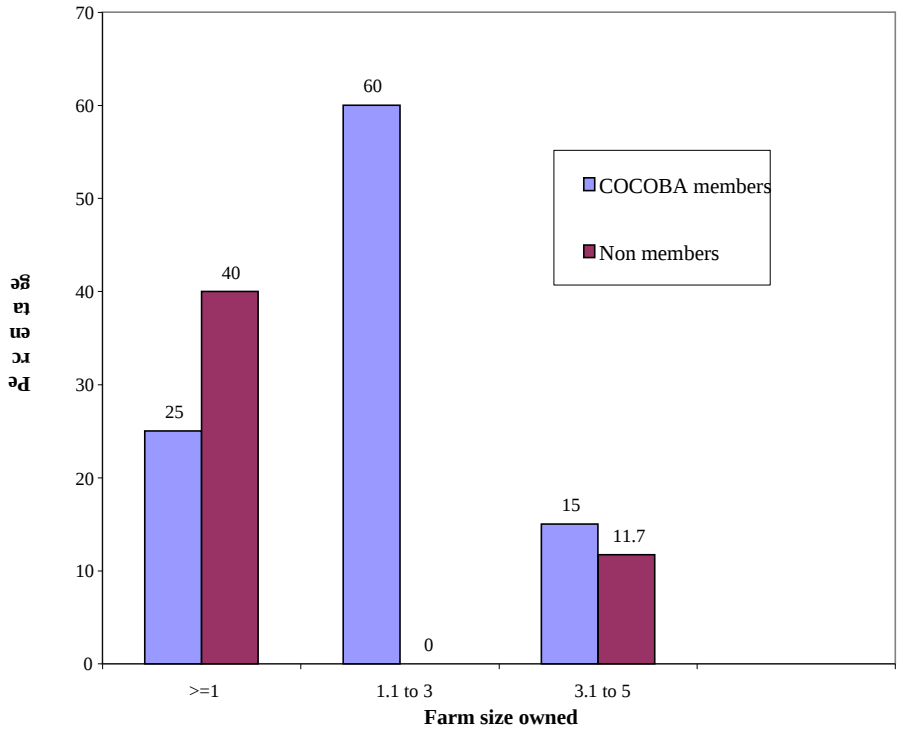

Figure 7: Distribution of respondents by Farm size owned per acre

However, it was noted that most of land owned in the study area are not used effectively since most of the respondents 68% use less or equal to 1 acre. This result imply that majority of respondents interviewed were engaged in subsistence farming rather than large scale farming. Large scale farming in the area is uncommon probably due to mountainous landscape of the area which prevents the cultivation of big area. On the other hand respondents in the study area particularly COCOBA members have a great opportunity of engaging in environmental conservation activities because they remain with excess land after cultivation.

4.1.7 Distance from resident to MMNP in hours

Fig. 9 below shows that the majority of COCOBA member respondents (43.3%) reside within 2 hours to 3 hours walking to Mahale mountains national park while 41.7% of non members stays at the distance of 2 hours to 3 hours walking to MMNP. 32% and 51% of

COCOBA members and non members respectively are staying at the distance of 4 hours to 5 hours walking to MMNP (Fig. 8).

A Chi-square test was run to determine the different between respondents distance from MMNP in hours and environmental conservation. The results revealed that there is no significance differences of (P>0.05) between distance from MMNP and participation in environmental conservation with Chi-square of 50.37 and the level of significant of 0.089. This implies that the distance of residence is not the criteria for joining in COCOBA group and participating in environmental activities.

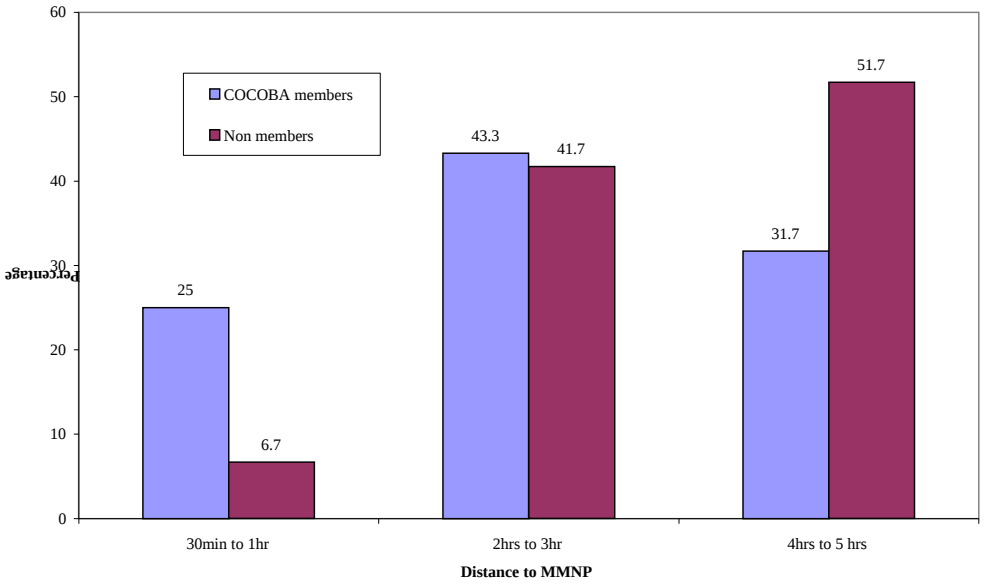

Figure 8: Distribution of respondents by distance to MMNP

4.2 Socio-economic Activities Undertaken by Local Community in the Study Area

The main economic activities carried out by the local community in the study area include farming (crop production), fishing, livestock keeping and small scale businesses (petty businesses) as shown in Fig. 9.

4.2.1 Farming

The majority of COCOBA member respondents in the study villages 83.3% and 88.3% of non members (Fig. 9) revealed that farming was their main socio economic activity. This confirms the findings of (Harrison, 2007), the main food crops cultivated in the study area include maize, cassava, beans, sweet potatoes and rice. Palm cultivation was the main cash crop grown in the study area. Rice and beans are sometimes grown as cash crops in the study area. These crops are sold inside the country and exported to countries such as Burundi, Democratic Republic of Congo and Zambia. Most of COCOBA members were engaged both in agriculture and business with the objective of increase family income. This argument is in line with the study of Ellis (2001), who indicated that in a variety of regional and local settings farmers capable of combining conventional farming activities with innovative rural enterprises enjoy higher income and safer livelihood than farmers delivering their income from conventional farming alone.

However, during the focus group discussion, respondents revealed that most of COCOBA lending institutions discouraged members to invest loans in agricultural activities because it is a long term investment and it is associated with high risk such as shortage of rainfall, diseases and lack of markets for the products. Also the loan provided with COCOBA terms was based on 3 to 4 months which is too short a period of time to invest in agricultural activities.

However, the high dependency on farming (83.3% and 88.3%) respectively is indicative that there is land pressure in the sampled villages. The community general forests in study villages were facing the problem of forest clearing in favour of farming activities. This result is supported by studies by Kiwale (2002) and Lalika (2006) who mentioned that the

loss of biodiversity is attributed to human economic activities, specifically the conversion of forestland for farming purposes. Remote sensing analysis by MEMP revealed that 10 % of the Greater Mahale Ecosystem was deforested between 2000 and 2007, this deforestation being concentrated on the densely populated lake shore areas (MEMP unpublished data). Furthermore, clearing of forests in general land in favour of farming culminate in environmental problems including land degradation, loss of wildlife habitat and environmental pollution. Also the results was supported with the study by Harrison (2007) who mentioned that, farming activity was seen to have marked effect on forest loss and land degradation through practice of shifting cultivation and uncontrolled burning used to clear the farm.

4.2.2 Fishing

The local fishing economy in the study area is also of great importance to the cash economies of the study villages. Fishing provides surplus cash and acts as a key stimulant for general economic growth. Most of people who are engaging in this activity were living close to the shore of Lake Tanganyika. The local fishing economy was dominated by the species *Stolothrissa tanganikae*, also known as the Tanganyika sardine or "*dagaa*" and "migebuka" (*Lates stapersii*). The results of this study revealed that, only a minority of member respondents (5%) and 3.3% of non member respondents in the selected sample were involved in fishing activity (Fig. 9). This generally means that most of respondents interviewed were depending on farming activity as their main livelihood income while fishing considered as a second livelihood activity to diversify and gain additional income.

4.2.3 Livestock keeping

Many respondents consider livestock keeping as an alternative income generating activity. The data revealed that there were no COCOBA member respondents involved in livestock

keeping as the main economic activity while 1.7% of non member respondents depend on livestock keeping as the main economic activity (Fig. 9). Respondents in the study area kept different types of livestock such chickens, goats, ducks and sheep. Most of the respondents revealed that, they only kept a small number of livestock to diversify their income and provide food in their family.

4.2.4 Petty trading

Fig. 9 shows that petty trading was the miscellaneous activity in the study area. Results reveal that only 11.7% of COCOBA member respondents and 3.3% of non member respondents were engaging directly in petty trading as their main economic activity. Most of the respondents mentioned that petty trading was considered as a second livelihood activity which helped them to gain additional income. Petty trading included: permanent shops (*duka*); sold cooked food commonly known as *"baba na mama lishe";* selling sardines and fish commonly caught in lake Tanganyika knows as 'Migebuka' (*Lates stapersii*); selling vegetables and operation of grinding machines. Crops used in petty trading include maize, rice, beans, cassava, palm oil and palm kernels (nuts). There was variation between member respondents and non member respondents in engaging in petty trading. More COCOBA member respondents were involved in petty trading than non member respondents because members had the access of credits which they used to run other income generating activities. However, majority of respondents argued that petty business were considered as a second livelihood used to increase family income.

4.2.5 Employment

Fig. 9 show that only 1.7% of non member respondents had formal employment. The reason for the low representation may be due to the fact the most of people with formal education consider themselves suitable for white-collar jobs which are mostly found in

town. Therefore people with formal education tend to move from rural to urban areas searching for the well paid jobs. Also the results revealed that, there was no representation from COCOBA members in the employment group. Since their establishment, COCOBA institution was targeted only the poor and the very poor that were unemployed. In case of conservation, employed people were likely to have little direct impact on environmental degradation as they depend mainly on salaried jobs instead of depending on forest resources like charcoal making, timber sawing and farming (Lalika, 2006). But indirectly these people have effect on environmental degradation since they have greater economic power to buy charcoal and firewood which is acting as a driver force for these activities.

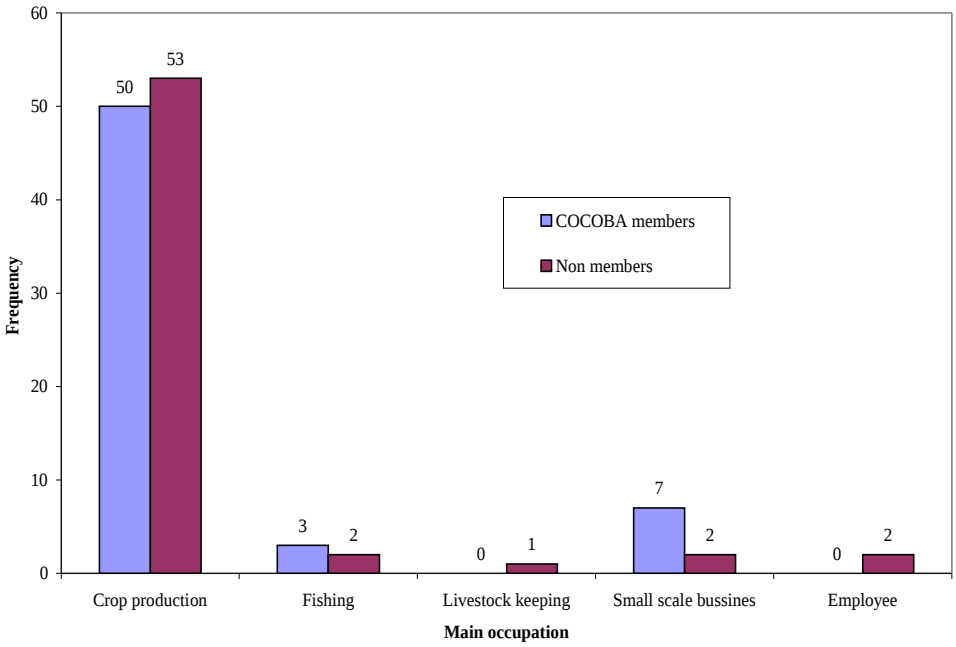

Figure 9: Main Occupation of the respondents

4.3 Performance of COCOBA

4.3.1 Achievement of COCOBA

Focus Group Discussion with member respondents showed that the objective of joining the group was to improve standard of living and fight poverty. Respondents were asked

whether the objective intended were achieved or not, most of respondents commented that COCOBA services have brought about positive changes in the standards of life of the clients. One of the respondents in group discussion reported a successful story of his father as follows:

"Since my father joined COCOBA, his life has been improved whereby he was able to build his house by using iron sheet instead of thatches, paying secondary school fees for his son and managed to run a small shop".

Eliza Bomoa from Nkonkwa village

The data from the field revealed that 95% of member respondents indicated that their main objective of joining the group was to access credit so as to obtain credit for business, saving services and to get different training provided in the group. Also 5% of member respondents joined COCOBA by the influence of their relatives and friends. Therefore friends and relatives also play a greater role in forming group generally through screening membership. The study also revealed that, COCOBA provides two types of services; financial services and non financial services. The financial services provided by COCOBA are mainly in the form of savings and loan of 3 to 4 months duration while non financial services provided are group operation procedure, business training and advice.

4.3.2 Loan repayment performance

During the present study members were asked whether they were able to pay their loans taken. More than 93 percent of the respondents reported that, they had completed repaying their loans in time. This was attributed by the internal social pressure of the group encourages members to reimburse on time in COCOBA over others as stated by respondents. According to the information obtained from COCOBA trainers, COCOBA groups in the study area were performance very well since more than 95% of loans taken annually were paid back successfully. This statement is supported by the study of CGAP

(2001) who said that, Microfinance is said to have good performance if it attains among other things, a minimum annual repayment rate of 95%. Despite of the achievement, sometimes COCOBA members face the problem of paying for defaulters within the group. Respondents reported that often they have to carry the burden of their fellow group members by being deducted their shares or contributing to pay the loan. However group members take various measures against their defaulters by selling the home assets for the one who default. This implies that although group solidarity is taken as collateral to credit provider still someone need to have some properties which will be used as compensation during default. A similar observation has been reported by Luoga (2008). On the other hand, respondents complained that short term loan provision under COCOBA terms which is 3 to 4 months, with the current 5% to 15% interest rate over the loan taken enables participants to make investment and tackle seasonal financial shortfalls that may have. However the short the loan term prevents longer term investment towards sustainability, for example in agriculture, the main economic activity. Furthermore the results show that 6.7% of member respondents failed to pay back their loans because they faced difficulties in servicing their loans. The reason put forward for failure of loan repayment were to direct the loan on unintended activities such as payment for treating illness, school fees, urgent celebration and payment of business losses.

Table 4: Distribution of member respondents by loan repayment performance

	COCOBA members	
Category (N=60)	**N**	**%**
Yes	56	93.3
No	4	6.7
Total	60	100

4.3.3 Credit Utilization

Respondents were asked if they encountered any family problem that forced them to use loan in issues which were not planned for. The findings in Table 5 indicated that 91.7% of borrowers used the loan obtained as it was planned as a working capital for their micro-enterprises. The micro-enterprises mostly supported by the capital from COCOBA were selling of fish commonly caught in lake Tanganyika. Types of fish most preferred are 'Migebuka' (*Lates stapersii*) and sardine. Other use of loan include small-scale retail outlets), selling of palm oil, palm kernel(nuts), food vending, operation of milling machine, selling vegetables and selling grains such as rice, beans, maize and cassava flour. However, most of the projects were small because of the time given to start repaying the loan. Members are given three to four months to repay. Also the amount of loans provided by COCOBA is not enough to invest in larger scale and long term business. It is important to note that more than 8 percent of the respondents failed to utilize their loans as planned but diverted the loan to solve other family problems. This shows that income generating activities may not have enough saving to cater for family needs. Thus until these needs are fulfilled then credit will help people move out of poverty. This supported by the study of Luoga (2008) that, it is only when people are economically secure that access to credit can help them to improve their livelihood. Reasons stated for credit diversion were using during sickness, buying food when the household have scarcity and paying school fees.

Table 5: Distribution of member respondents by credit utilization for the purpose acquired

	COCOBA members	
Category (N=60)	**N**	**%**
Yes	55	91.7
No	5	8.3
Total	60	100

4.3.4 Training on credit utilization before given loan

Results in Table 6 shows that 95% of group members have received training in relation to micro enterprises undertaken with members and management of credit. While 5% of member respondents said that they have never attended or received any training through their groups. Statistically there was no significant difference between those who received and who don't, that means almost all members received training before acquired the loans.

Table 6: Distribution of number of COCOBA member respondents received training prior to accessing a loan

	COCOBA members	
Category (N=60)	**N**	**%**
Yes	57	95
No	3	5
Total	60	100

This results was contrary to the study by Word Bank (1993) stated that many of the group members, entrepreneurs and managers of entrepreneurs often lack training on technical or management of their enterprises. COCOBA model provide training during the initial stage of group formation, the training provided are based on group leadership, selecting, planning and managing business as revealed by 93.3% of member respondents. After the group has been graduated from the training then group members were allowed to take loans to invest in their micro-enterprises or establish the new micro-enterprise.

However, all respondents felt that they need more training on financial management and business skills, because the training received before was based the small scale enterprises. According to the small and medium enterprises development policy, small enterprises are formal undertaking with capital investment ranging from Tshs. 5 million to Tshs. 20 million (URT, 2003) and COCOBA groups are falling under this policy. Currently

COCOBA groups have a capital of over 20 millions, therefore there was a need of training which match with their capital.

4.3.5 Profit obtained after paying back loans

In the study, the results showed that:

- More than 41.7% of COCOBA members realized a profit below 50 000 thousands Tanzania shillings after paying back their loans
- In this study, 35% of respondents got profit between 100 000 to 200 000 Tanzania shillings.
- However only 5% of the respondents got profit above 200 001 Tanzania shillings.

Thus, 90% of entrepreneurs made a profit on their business activities.

Table 7: Distribution of member respondents by profit obtained after paying back the loan

Category (N=60) Profit margin	COCOBA members	
	N	%
None	6	10.0
<=50000	25	41.7
50001-100000	5	8.3
100001 - 150000	14	23.3
150001 - 200000	7	11.7
>200000	3	5.0
Total	60	100

This result indicated that accessibility of credit to the respondents had played a great role in improving clients' livelihood and raise standard of living as presented in Table 7. Borrowers were able to buy new household appliance such as radio, table, chairs, land, grinding machine and cooking pots. Also the access of credit allowed their children to progress further in school. T-test analysis revealed that there is no significant difference of

(p>0.05) between sex on profit obtained after paying back the loans. However there is slight difference in profit obtained by male and female borrowers. The finding shows that female borrowers got more profit than male borrowers.

Table 8: T-test results of the profit obtained after loan repayment by sex of the respondents

Sex of the respondent	Frequency	Mean	Std. Deviation	t	p	df
Male	24	2.54	1.587	-217	0.829	58
Female	36	2.64	1.775			

Table 8 shows that any increase unit of women in accessing credit will lead for the increase of profit obtained by 0.217, while any unit increase of male in accessing to credit will lead to the decrease of profit by 0.217. That means when women are trusted to manage financial resources by accessing credit, normally they are much more efficient and effectively in profit maximization than men. Furthermore, the study revealed that, there was clear gender differences in the sample in the use of profit obtained. Men preferred to direct their profits to investing in or expanding their business while women have a tendency to use their profits to increase household's consumption such as buying food, clothes and other expenditure affecting family and child welfare. This was supported with the study by Khandker (1999). In his study on tracking the borrower among Maya in Bangladesh, he wanted to show differences in the use of profit obtained between male and female entrepreneurs. Male entrepreneurs in the survey showed a greater predilection towards redirecting profit into investment while female entrepreneurs were more inclined to use profit to increase household consumption.

4.3.6 Changes in income position since joining COCOBA

State intervention in the credit programmes provide a coping mechanism to the poor to fight against poverty (Meyer, 2000). Respondents in this study were asked to state whether their income and expenditure had been improved, unchanged or don't know their status after credit utilization.

Table 9 shows that, 83.4% of COCOBA member respondent's income has been improved, 13.3% of member respondents' income has not changed and 3.3% don't know their status. The results revealed that majority of COCOBA members interviewed considered themselves to be better off and in some cases this has led to make choice and move away from dependency on unsustainable resources use. This was attributed to good utilization of loan according to what was planned for. Therefore, increases in income were indicators of improvement in well being to some of the group members and sign of moving away from environmental destruction. This result is in line with the study of Likwelile (2008) on the attacking poverty in Tanzania. In his study he concluded that, microfinance operated in Tanzania have brought about positive changes in the standard of life of clients who received microfinance services. For those whose income has not changed indicated that, it was due to poor markets for the goods, lack of road and communication, encountered family problems such as sickness, hunger and deaths, big family to take care and getting difficulties in running their business since most of people are doing the same business while the purchasing power was very low.

Table 9: Distribution of member respondents by position of income changes since joining COCOBA

	COCOBA members	
Category (N=60)	**N**	**%**
Improved	50	83.4
Unchanged	8	13.3
No response / don't know	2	3.3

Total	60	100

4.3.7 Reasons for life improvement

During the survey member respondents were asked to give reason that made their life to be improved. The responses to this question are summarized in Table 10 below. The results show that 75% of member respondents responded that their life has been improved due to the benefits they got from COCOBA loans. Member respondents stated that the credit received was invested in income generating activities where they got more profit to: meet household consumption, pay school fees for their children, pay hospital bills, improve nutrition and hire labour for the farm work. About 18% of member respondents got loans from different lending Banks, loans from friends and relatives and 6.7% of member respondents had not benefited from any loans. Respondents revealed that their life has been improved in term of number of meals taken per day.

The majority 93.3% of member respondents were able to get two to three meals per day compared to one to two meals per day before joining COCOBA as revealed by respondents. Also the findings indicated that more than 50% of respondent's houses were built with fired bricks compared to 35% of the houses reported to the study conducted by Harrison (2007). Majority of these bricks have been burnt with firewood rather than alternative energy means such as rice husk. The implication of this to the environment conservation is that bricks making for houses by using firewood accelerate environmental degradation to the area although the community perceives it as a step towards development. 73.3% of these houses were roofed with thatches as iron sheet roofs are uncommon in the study area. This situation has been resulted by the lack of shops selling iron sheet in the study area which were caused by higher transporting cost from Kigoma town as well as low financial capability of the community.

Table 10: Reasons for life improvement

	COCOBA members	
Category (N=60)	**N**	**%**
Benefit from COCOBA loans	45	75.0
Benefit from friend and relatives loan	7	11.6
Loans from different lending banks	4	6.7
Not benefited	4	6.7
Total	60	100

4.3.8 Problems encountered by COCOBA member when running their micro enterprises

During the study, respondents were asked to identify problem encountered or exposed them to threats when running businesses. Respondents were told to prioritize the problem according to the weight they hold. The main problems raised by member respondents under the study area were summarized in Table 11 below. 36.7% of member respondents stated that, lack of reliable transport such as road and phone communication in the study area is a major limiting factor for the business. In terms of infrastructure, the only way from Buhingu division to reach Kigoma town or the rest of the country is to go by foot or bicycle or via lake, taking a canoe out to the ferry which passes by once a week (Harrison *et,.al*, 2007). If the lake is rough, travel by boat or accessing the ferry if it passes becomes very difficult or impossible due to lack of harbours. This situation means that people have to wait for businessmen to come to them to buy their product and most of the time they have to sell products according to buyer's prices regardless of the cost incurred. In general lack of road to the area made it difficult for people to operate their business to highly profitable degree. This means that the majority individual activities do not bring in sufficient wealth rather a proportional increase of income required to meet family needs. Also the lack of phone communication to the study area has been another limiting factor for the achievement of members business.

Over 27% of responds indicated that, lack of assured market to their area was a main problem made entrepreneurs not comfortable in running their business. 17.7% of the respondents mentioned lack of agriculture implements and insecticides as their main problem while 6.7 of member respondents indicated high expenses of life and 5% of respondents mentioned outbreak diseases. An outbreak disease such as cholera which is a waterborne disease was very common and has killed a number of people in the study area. This was the result of community members depending solely on unsafe and unclean water from the lake and rivers for domestic uses. Some of respondents in group discussion indicated that, sometimes borrowers were forced to use their loans to treat family members when caught with diarrhea. This argument is supported with findings by Mwailafu (2007) who indicated that, sometimes borrowers were faced with urgent needs such as disease which enforce them to use loan to treat illness instead of investing in business.

Table 11: Distribution of member respondents by major problem encountered when running business

	COCOBA members	
Category (N=60)	**N**	**%**
Lack of guarantee transport such as road	22	35.7
Outbreak diseases	3	5.0
Lack of assured markets	16	27.6
Inadequate capital	8	13.3
Highlife expenses	4	6.7
Lack of agriculture implements and insecticides	7	11.7
Total	60	100

4.3.9 Environmental sustainability

In term of environmental sustainability, a number of opportunities to improve environmental sustainability of individual businesses were applied in COCOBA groups. The main mechanism used was the setting of prohibitions against unfriendly income generating activities. Several groups have set rules and regulations as to which type of income generating activities members should be involved in, and which ones are

environmentally unsustainable. In some cases the proponents of the schemes made decisions as to which activities should be prohibited. These prohibitions were then included in the constitutional documents of the groups. This argument is in line with the study by Wild *et al.* (2008) when studying Village Saving and Loan Association (VSLA) in Zanzibar, he found that group members were prohibited to take loan and invest in charcoal production or wood cutting for sale.

Environmental sustainability is often not a clear cut issue and the way that any individual business is operated affects its environmental impact and hence sustainability. Thus the outright prohibitions used by some associations may be a necessary but less ideal than a more subtle approach that maybe takes steps towards environmental sustainability.

4.4 Livelihood Improvement

4.4.1 Influence of credit on annual income

Although there was difficulties involved in measuring the increase of income contributed by credit provision, studies has demonstrated that the availability of credit to micro-entrepreneurs can have a positive effect on borrower's livelihood (Luoga, 2008). Respondents were asked to estimate their income from farm products obtained in the last cropping season and profit obtained from off farm activities per year. Comparison means between members and non members were subjected to T-test. The results indicated that there was a significant difference in estimated income earned per year between members (1 546 057.56) and non members (828 045.35) as observed at T-test (3.907) statistically significant difference at $P<0.05$ (Table 12). This implies that the use of micro financial services had influenced members' involvement in other income generating activities such as off –farm activities than non members. The allocation of capital resources to off- farm activities results into more gross of income to members than their counterpart. Therefore significantly higher annual income of borrowers has the implication that credit use has a

positive role in poverty reduction. Credit enables the beneficiaries to increase more income and meet family needs that contribute to poverty reduction at the household level. The positive correlation indicated in T- test shown that being a member of any financial institutions (COCOBA) leads to increase of individual annual total income by 3.907.

Table 12: T- test results of COCOBA members and non members by estimated annual income per year

Category	N	Mean income	Std. deviation
COCOBA members	60	1 546 057.56	1243432.21
Non- members	60	828 045.35	693129.15
Total	120		

t = 3.907, df = 118, P= 0.000

4.4.2 Influence of COCOBA on assets owned

Household assets are the components of the household physical capital and can be used to measure livelihood improvement. Therefore, estimating the value of household assets is fundamental in assessing livelihood improvement of respondents. Respondents were asked to give the estimates value of household assets they owned. Among other assets mentioned were transport facilities, news media means, furniture, kitchen facilities, land and houses. Chi- square was used to determine the influence of COCOBA on the total value of assets owned by respondents. The results indicated that, there was no influence of COCOBA on total value of assets owned by respondents (P> 0.05) in Table 13. Also T- test was run to determine the difference of mean value of assets owned by members and non members. Also the results shown that, there was no significant different between the mean average of members 941 048.33 and 700 221.66 of non members in relation to value of assets owned in the household (P> 0.05) as indicated in Table 14 below. Results obtained in this study contradict from earlier study by Ellis (2001), which indicated that, credit beneficiaries used the loan for acquisition of personal and landed property such as land,

furniture and other household items. As the results indicated lack of different between credit beneficiaries and non beneficiaries in term of asset ownership; probable explanations could be that, from the initial stage of group formation, COCOBA model was targeting the most vulnerable groups which were the very poor and poor people living adjacent to Mahale mountains national park.

Therefore the majority of people joined the groups were low income earners and considered to live below poverty line. Annual income of the respondents indicated to be improved on the average of 128,800/= in a month per household including farm and off farm income. Although the findings indicated that COCOBA has not influenced members to own assets but it has helped members to meet their basic needs. This implies that the amount gained through COCOBA was only enough for meeting household basic needs such as food, clothing, treating the illness and paying school fees for their children. Also this indicated that, at the time of this study COCOBA members were able to meet only their basic needs and lack extra money to buy assets. It was hypothesized that, a person can buy assets after human needs satisfaction. Time spend in the group by respondents might be another reason. Randomly sampling might be selected most of respondents who have been spent short time in the group and hence led difficulty in measuring life improvement by using asset ownership component.

Table 13: Distribution of respondents according to the value of assets owned

Category of asset value of asset owned by household	COCOBA members		Non COCOBA members		Total	
	N	%	N	%	N	%
<=200000	12	20	9	15.0	21	17.5
200001-400000	17	28.4	11	18.3	28	23.3
400001 – 800000	15	25.0	19	31.7	34	28.3
800001 – 1200000	5	8.3	14	23.3	19	15.8
>1200000	11	18.3	7	11.7	18	15.1
Total	60	100	60	100	120	100

Chi-square=7.337, df = 4, P = 0.119

Table 14: T- test results of COCOBA members and non members by value of assets owned

Category (N= 120)	N	Mean value of assets	Standard deviation
COCOBA members	60	941048.33	1167474.90
Non - members	60	700221.66	740011.85

t = 1.350, df =118, P=0.180

4.5 Activities Performed by Local Community in Environmental Conservation

4.5.1 Tree planting

Tree planting is one among the strategies used for environmental conservation. Tree planting serves a number of ecological and services functions that are important for human survival (Lalika, 2006). Therefore it is crucial to plant trees on farms and around homestead instead of relying on natural resources products. This can help in reducing the rate of encroachment in the National park and other reserved area thereby attaining sustainable biodiversity conservation**.**

During the study respondents were asked to state whether they are engaging in tree planting activity or not and the number of tree planted. Chi-square test was used to determine the difference between members and non members on the number of tree planted. The result indicated that, there was a significant difference between members and non members on tree planting programme participation. Chi-square analysis indicated statistical significant of (P< 0.05) as shown in Table 15.

Table 15: Distribution of respondents by the number of tree planted

	COCOBA members		Non COCOBA members	
Category (N=120)	**N**	**%**	**N**	**%**
<= 5 trees	33	55.0	48	80.0
6 - 10	10	16.7	5	8.3
11 - 15	3	5.0	3	5.0
>=16	14	23.3	4	6.7
Total	60	100	60	100

Chi-square = 10.000, df = 3, P= 0.019

In this study 45 percent of COCOBA members planted more than 6 trees while only 20% of non members planted more than 6 trees. This implies that, COCOBA members have more awareness in implementing conservation activities than non members because in COCOBA terms, members were provided with training on environmental issue and prohibited to implement environmental destruction activities such as unsustainable charcoal making, lumbering and cutting trees for selling. Peer pressure and the trust built in the group enforce COCOBA members to provide impetus for people to select environmental neutral or beneficial activities. Also a number of COCOBA groups had established an environmental fund which was provided with interest free for appropriate environmental activities. However, it was found that, most of these groups had never used this fund for environmental activities at the time of this study. Therefore, there was a need to sensitize group members to utilize their environmental fund to finance environmental activities such as tree nurseries and tree planting programme. This study is in line with findings of Wild *et al.* (2007) who concluded that, integration of environmental training issues and implementation of alternative income generating activities in micro credit institutions operation stimulates higher level of environmental conservation in the area. However, the number of trees planted by respondents may also be influenced by other factors namely age, household size, education level, farm size owned, farm size in use, labour working in farm, income of the household, supply of free tree seedling and distance from the park. Multiple regression model was used to determine the influence of these social economic characteristics on tree planted by the household as described in next section.

4.5.2 Influence of social economic characteristics on tree planted

Table 16 shows the influence of social economic characteristics on trees planted in the study villages. Number of tree planted (dependent variable) were modeled against independent variables indicated in Table 16. To test the relationship, a multiple regression model was estimated using beta weight and confidence intervals for all variables. The data in Table 16 illustrate the parameter estimate for independent variables on the dependent variable.

Table 16: Regression model to explain effect of social economic characteristics on tree Planted

Y(R^2 = 0.270)

Xi	Beta	SE	t	Sign level
Age of the respondent	-0.035	0.142	-0.380	0.705 NS
Household size	-0.162	0.719	-1.676	0.096 NS
Education (years)	-0.013	0.412	-0.148	0.883 NS
Total farm size owned	-0.110	1.454	-0.993	0.323 NS
Farm size in use	0.171	1.787	1.579	0.117 NS
Labour working in farm	0.268	2.086	2.705	0.008 *
Distance from the Park	0.069	0.989	0.773	0.441 NS
Income of the household	0.089	0.000	0.915	0.362 NS
Supply of free tree seedling	-0.442	0.617	-4.960	0.000 *
(Constant)		7.690	1.477	0.142 NS

P= 0.000, df = 9, F = 4.528

* = Statistically significant at 0.05 level of significant

NS = statistically non significant at 0.05 level of significant

The coefficient determination R^2 = 0.270 approximate of 0.27 which implies that independent variables were able to explained about 27% variation of dependent variable.

That means only 27% of the variation in a given dependent variable is explained by the variables in the equation. The rest 83% cannot be explained by the variables in the equation. This is a relatively small power for an equation to explain variation. However the results in regression analysis show the significance correlations of F value of 0.0000.

In regression analysis results, it is evident that some socio economic factors had some influences on the amount of trees planted. From table 16 the results from significant test shows that supply of free tree seedling (p= 0.000) and labour working in farm (p=0.008) were statistically significant at $P < 0.05$ level of significant. Of the significant factors, it is labour working in farm from the household that contribute more to the model (beta=0.27). Other variables such as age, household size, education level, farm size owned, farm size used, income of the household and distance from the national park were not statistically significant.

Table 16 shows that positive correlation was depicted between number of trees planted and farm size in use, labour working in farm, distance from the park and income of the household. Nevertheless, negative correlation was depicted between the number of trees planted against age of the respondent, household size, level of education and total farm size owned. The next section discuss on how these factors influence dependent variable.

4.5.2.1 Labour working on farm and tree planted

Table 16 shows significant correlation (p=0.008) with number of planted trees. The positive regression coefficient (r =0.2) which signifies that the increase of labour force on farm led to the increase number of trees planted by the household This implies that, families with high labour force in the farm is relatively easier to diversify their labour force in other activities like tree planting as opposed to smaller labour force that concentrate mainly on production of basic needs for survival. .However, Figure 10 shows that the household with only two people working in the farm have planted more trees than other groups, the reason behind might be that most of the working labours in the study were parents (father and mother)

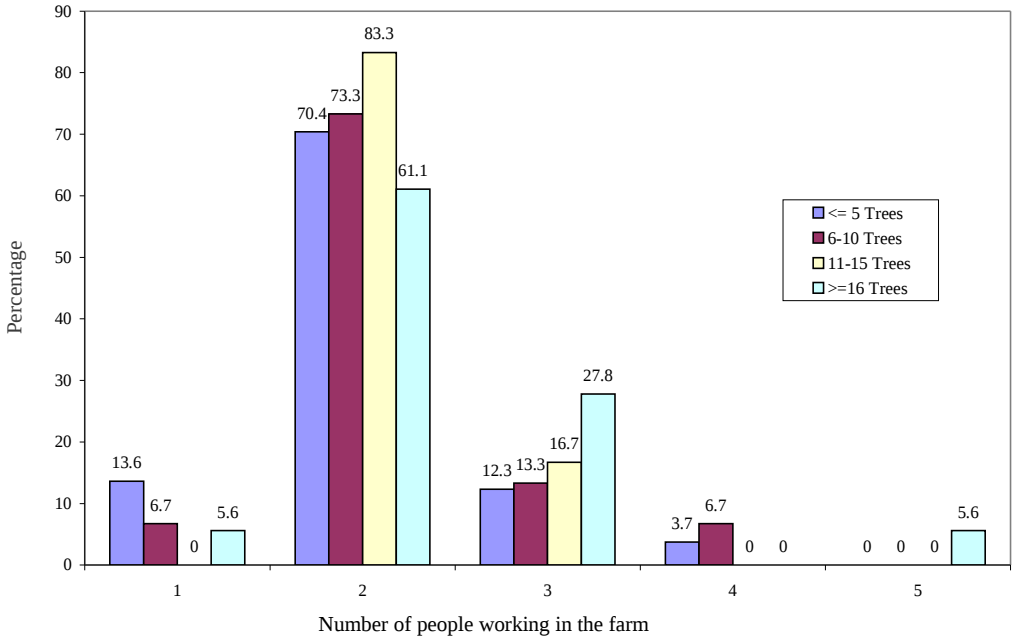

Figure 10: Relationship between labour working in the farm and number of tree planted

4.5.2.2 Supply of free tree seedling

Supply of free tree seedling was negatively correlated with number of trees planted. This indicated that, any unit increase of free tree seedling supply lead to decrease of trees planted by 0.442. This is logically true in the sense that when an institutions or organization is only concentrating in providing free tree seedling without making follow up on the farms and providing training on how to manage those seedling, there is the possibility of people not planting those trees and sometimes the planted trees are likely not to survive because of the poor management.

4.5.2.3 Distance from the Park

The data in Table 16 also shows a non-significant effect of ($p=0.441$) between distance of a person reside from the National park and number of trees planted. The findings indicated a positive correlation between the distance from the Park and number of trees planted. This implies that any unit increase of distance from the park leads to the increase the

number of trees planted by 0.069 although statistically was not significant. This denoted that people residing far from the Park are faced with the shortage of natural resources such as firewood, poles, charcoal, and timber as the results of unsustainable use of land for agriculture and other activities. Therefore respondents are more likely to plant more trees in order to meet demands mentioned above unlike those who reside close to the park, who sometimes illegally enter in the park to get those natural resources. Fig. 11 shows the relationship between distances of a respondent reside and number of tree planted.

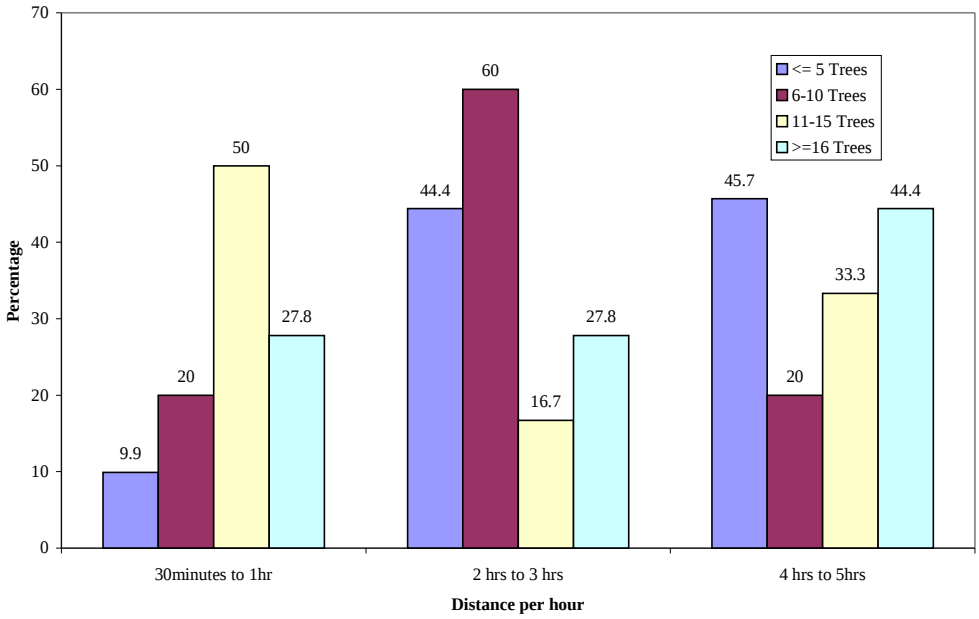

Figure 11: Relationship between distance from MMNP and number of trees planted

4.5.2.4 Age of the respondent

The result shows that age of the respondents was found to be negatively correlated with the number of trees planted and non significant of (p=0.705). The hypothesized statement indicated that, the older the age the more a person is likely to engage in tree planting than the young ones. The finding of this study is contrary to the hypothesized statement. Table 16 indicated that, any unit increase of the respondent age led to the decrease number of trees planted by beta 0.035. This is attributed to the fact that, the more elder an individual

become the more he/she become less active to involve in production and environmental conservation activities such as tree planting as shown in Fig. 12. Also the young age group (15 -25) is not engaged much in tree planting probably due to the fact that the majority in this group does not have access to land for planting trees.

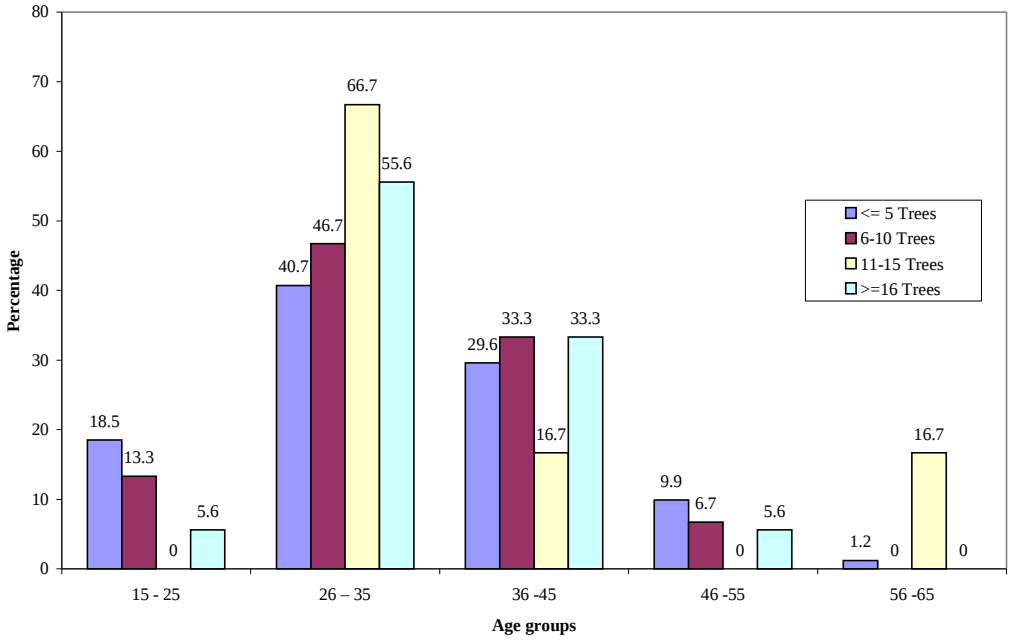

Figure 12: Relationship between age and number of trees planted

4.5.2.5 Farm size owned

Table 16 shows that farm size owned was positive correlated with number of tree planted. The result shows that any unit increase of farm size leads to the increase of number of tree planted by beta 0.110. The relationship between farm size and number of trees planted was not significant (p=0.323). This is contrary to hypothesized statement that families with large size of farm are more likely to plant more trees than those with smaller farm land in the sense that with large farm land one could allocate some land for tree planting and other for food and cash crops production. The reason behind might be that, it is not necessary for a person who possess a large farm size to allocate area for tree planting (Fig. 13).

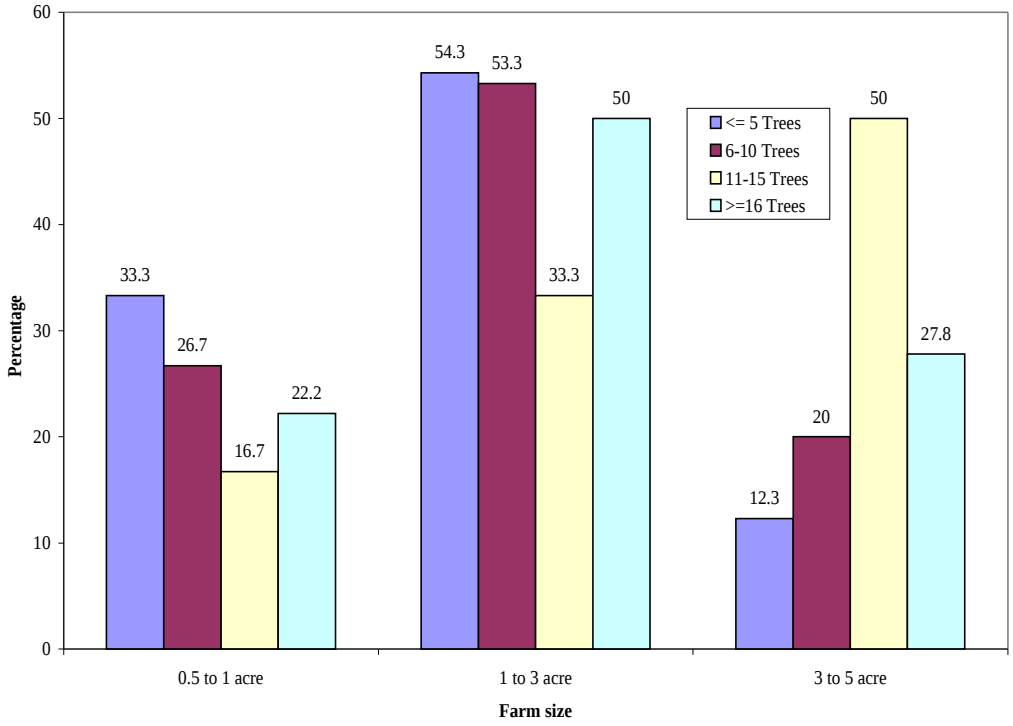

Figure 13: Relationship between farm size owned and number of tree planted

4.5.2.6 Farm size in use

The result from regression analysis shows that there was positive correlation (r = 0.171) between number of tree planted and the size of farm used by the household although statistically was not significant. The reason behind the positive correlation is that farmers use a large farm size would like to adopt agro forest practices such as wood lots, tree crop combination and improved fallow. Finding of this study is in line with the study by Lalika (2004) who showed that the number of tree planted increases with the farm size in use.

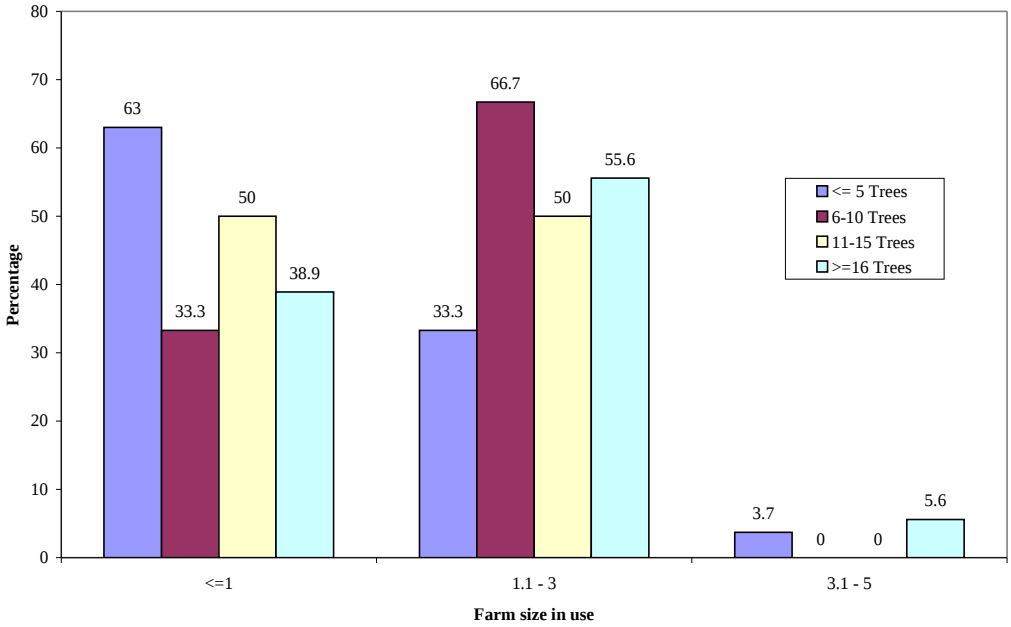

Figure 14: Relationship between farm size in use and number of tree planted

4.5.2.7 Household size

Household size was negatively correlated to the amount of trees planted. This indicated that any unit increase of household size lead to the decrease of the number of tree planted by beta 0.162. This can be attributed to the fact that the larger the family, more food and other household consumption are needed. Therefore more land is needed to support their life, and hence fewer trees will be planted. This observation is in line to the study by Lalika (2006) who suggested that as household size increases, the number of planted trees tend to decrease.

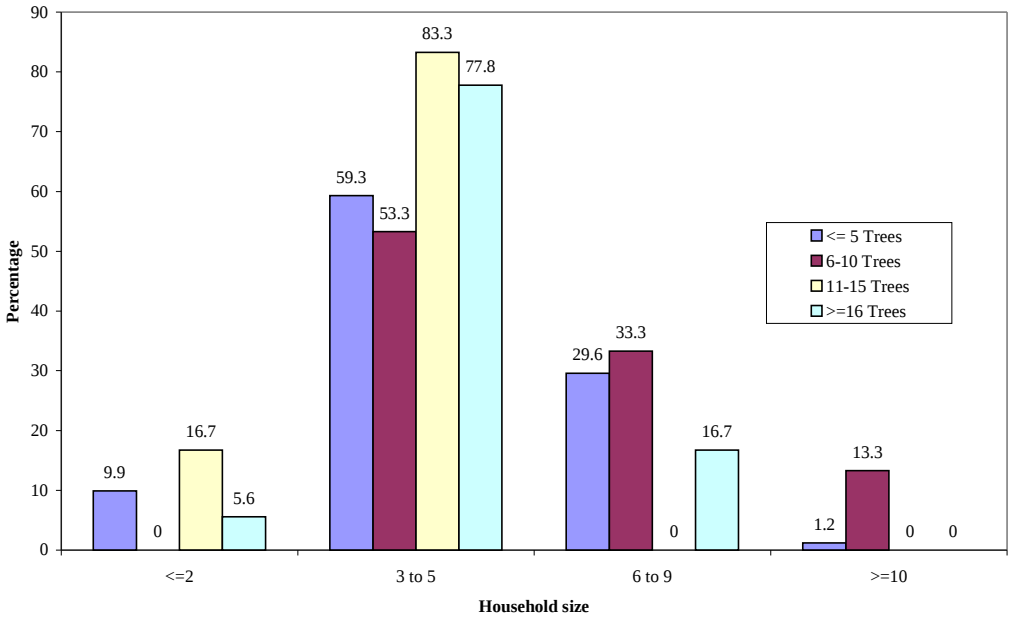

Figure 15: Relationship between household size and number of tree planted

4.5.2.8 Education level

Education level was negatively correlated to tree planting. This implies that any unit increase of education level leads to the decrease of tree planted by 0.013 as presented in Table 16. That means, more educated a person become less likely to engage in environmental conservation activities. This can be attributed to the fact that as the level of education of respondent increases, there is a tendency of people seeking for the color jobs in towns that pays well and reduce dependency on natural resources use. This made educated people to regard conservation activities like tree planting as suitable for the less educated ones hence loosing the interest of participating. The findings in Fig. 16 shows that, majority of the respondents engaged in tree planting completed only in standard seven.

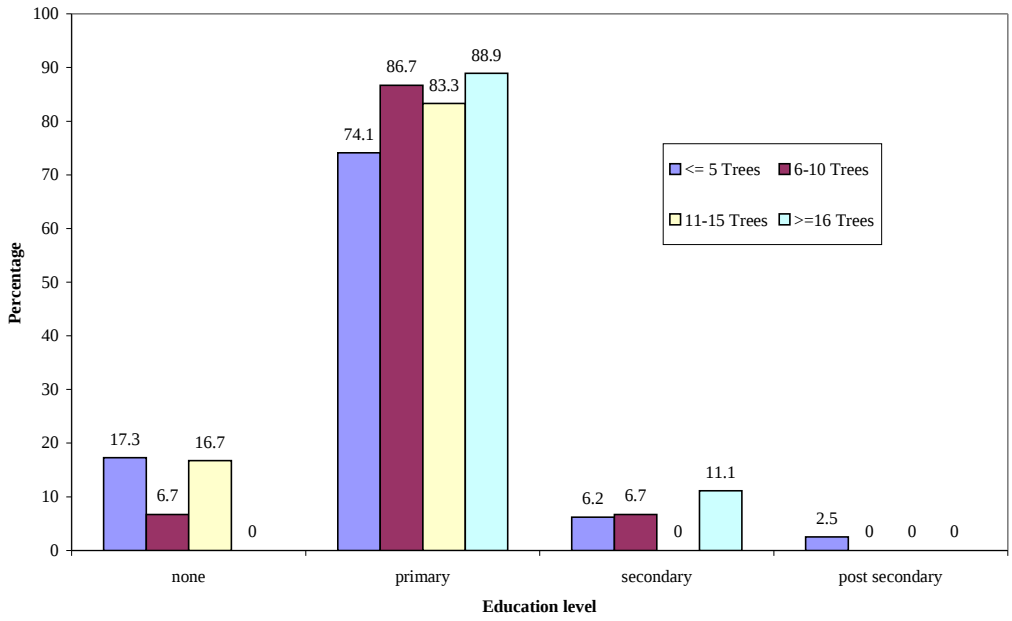

Figure 16: Relationship between education level and number of tree planted

4.5.2.9 Income of the household

The income level of the household found positively correlated to the number of trees planted. The finding shows that any unit increase of income of the household lead to the increase of the number of tree planted by beta 0.089. Despite of household income indicating non significance on tree planting (P= 0.362), the positive correlation denoted that people with higher income had ability to purchase land, tree seedling and hiring a person for tree planting and watering seedling. In this case it is difficult for less income earner to implement such kind of activity compares to those with more income level. This observation is in line by the study of Machumu (2001) who observed positive correlation between planted mangrove trees and level of household income. He concluded that household with relatively higher income planted more trees than less income household as shown in Fig.17.

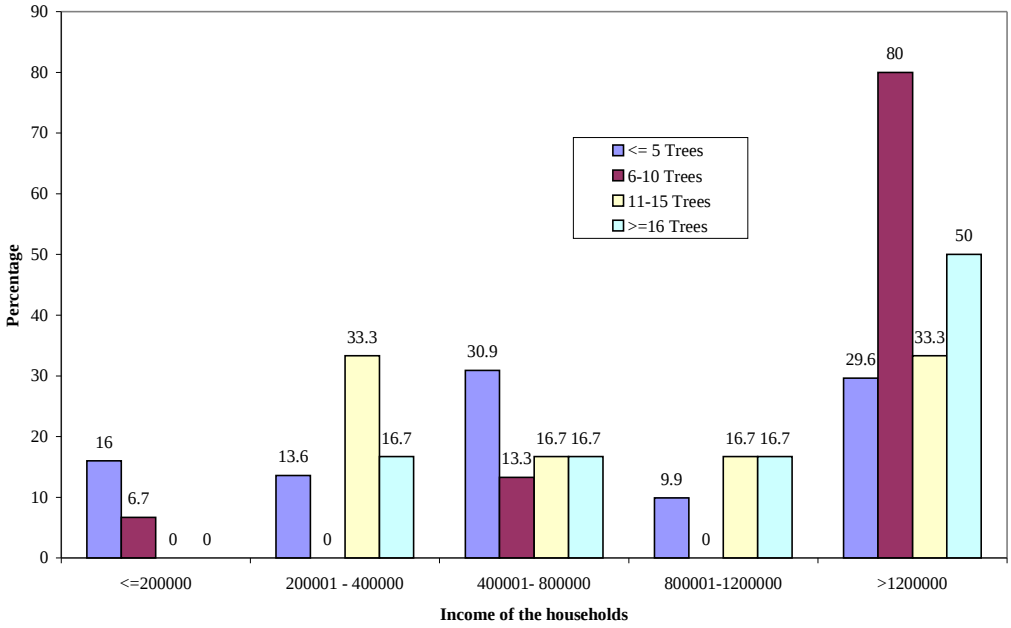

Figure 17: Relationship between income of the household and number of tree planted

4.5.3 Uses of improved stoves

The result in Fig. 18 shows that 63.3% of COCOBA members and 40% of non members use fuel efficient stoves. The results reveal that, COCOBA members were participating more in construction and uses of fuel efficient stoves than their counterpart. Also a chi-square test analysis obtained ($X^2 = 6.541$) indicated that there was significant different ($p < 0.05$) in the construction and use of improved stoves between COCOBA members and non members as shown in Fig.18.

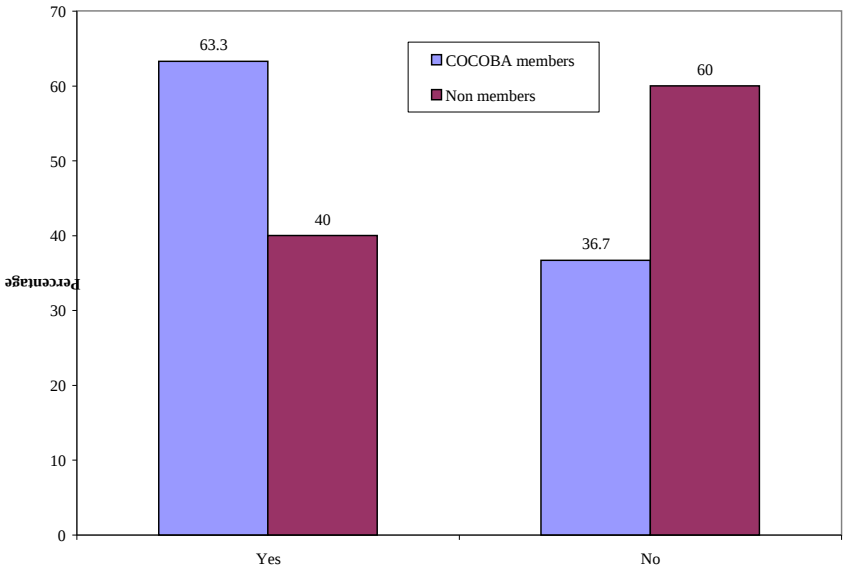

Figure 18: Uses of fuel efficient stoves by respondents

This was attributed to the fact that COCOBA members have more awareness on environmental conservation issues and its importance because the model provides different training concerning environmental conservation activities. However some of respondents argued that, not all people constructed improved stoves are using them effectively, sometimes they are going back to three stones traditional stove because they are used to it. 36% of member respondents and 60% of non member respondents, who do not use improved stoves, said that they lack awareness and knowledge of making them. The implication of this is that majority of household are still using traditional stoves which do not appear to use firewood in efficient way.

4.5.4 Beekeeping

78% of respondents stated that they do not keep bees. Only 22% of respondents involve in Beekeeping. Within respondents involved in Beekeeping, 85% were COCOBA members. Even though the number of respondents participating in Beekeeping is low due to its little

contribution as a livelihood activity in the study area, still COCOBA members were doing better than non members. Also respondents indicated that in every village there were a number of small-scale beekeeper's groups established under MEMP support. MEMP supported these groups in terms of provision of modern hives where every group received 20 hives, 3 pairs of bee protection equipments and payment of District Beekeeping officers allowances for providing training on Beekeeping activities as well as supervising these groups. District Beekeeping officer was paid by MEMP due to the lack of government fund supporting these groups. 54% of beekeeper respondents received training on modern beekeeping process, candle making and honey processing and packaging while 46% of beekeepers interviewed did not receive any training. Most of beekeepers who did not receive training were private beekeepers uses traditional long hives made from local hardwood species or borassus palm (*Borassus aethiopum*). However, respondents indicated that beekeepers face a continual threat from fire, which often destroys hives, as well as the risk of bee colonies being driven out by honey badgers, ants and wax moths. Generally, this implies that the return of beekeeping activity was very low compared to other activity and this was caused by pests and fire as well as market for bee products.

Table 17: Distribution of respondents by Participation in Beekeeping

Category (N= 120)	Frequency	Percentage
Yes	26	21.7
No	94	78.3
Total	120	100

4.6 Human and Social Capital among Respondents

Human capital includes education, skills, knowledge, health, nutrition and labour power. Social capital includes any network that increases trust, ability to work together, access to opportunity, reciprocity, informal safety nets and membership.

4.6.1 Access to health services

Accesses to health services are used to explain well-being of an individual since health and productive members are important assets in household production process. Majority of the respondents interviewed 90% indicated that, they had access to health services available in their villages and these dispensaries are operated under Tanzania Government. These dispensaries were seen by the majority as under- manned, due to poor trained staff and often lacking medicine. The very sick persons have to travel either at Buhingu health center or to the regional government hospital in Kigoma town and sometimes the very sick do not survive in time to reach treatment. Health services provided in rural areas in Tanzania are evenly distributed regardless being a COCOBA member or not do not taken into account of accessing it.

4.6.2 Status of respondents to belong to social organization

Social capital includes any network that increases trust, ability to work together, access to opportunity, reciprocity, informal safety nets and membership in organization. During this study, a status of a respondent to belong to social organization especially COCOBA was considered. An often repeated appreciation from many members is the social changes, with the solidarity groups creating a strongly supportive group framework for personal savings and business development. This social component is extremely important to OCOBA members and was cited as more important than the financial gains by several female respondents. Group members often feel they have improved social status due to their increased wealth and social interactions that group membership confer. The similar observation was reported by Mutatina (2008) in the goat project where women farmers become more economically empowered, which enable them to gain greater control over resources, which in turn increases their capacity to participate in social activities and household decision. Also the study is in line with the study by Gondo (2009) who

indicated that credit act as an entry point to strengthen women's networks and mobility, increase their knowledge and self confidence and enhance their status in their household.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

The importance of credit in reducing poverty in Tanzania is well acknowledged and documented but few document exist on its role in environmental conservation and livelihood improvement General objective of this study is to assess the role of Community Conservation Banks (COCOBA) in improving rural livelihoods and sustainable conservation of the Mahale Ecosystem. The purpose was to provide empirical data to policies practitioners on the importance of credit in environmental management and livelihood improvement. The purpose of this chapter is to presents the major findings, major conclusion, recommendation and area for further study. This chapter is divided into four section whereby section 5.2 presents major findings; section 5.3 presents major conclusion; section 5.4 presents recommendation and section 5.5 presents area for further research.

5.2 Summary of Major Findings

5.2.1 Socio-economic activities undertaken in the study area

The study identified farming as the major socio-economic livelihood undertaken across all the study villages by more than 80% of the population. Other livelihood activities undertaken to the area were fishing, livestock keeping and small scale businesses (petty businesses) Petty business was considered as a second activity taken by the community to substitute their income. This activity was mostly done by COCOBA members who have access to credit services. COCOBA lending institutions discouraged members to invest loans in agricultural activities because it is a long term investment while loan provided was based on 3 to 4 months which is too short a period of time to invest in agricultural

activities Also the study found out that the area is facing forest loss and land degradation due to clearance of forest in favour of farming as a major socio economic activity, shifting cultivation and uncontrolling fire.

5.2.2 Performance of COCOBA in the supported livelihood activities

Analysis of this objective found out that COCOBA model has performed better in the study area. The findings reveal that the initial training input in establishing COCOBA groups was very important for the success of the group. Majority of the respondents were able to complete paying their loan in time and more than 95% of loans taken annually from COCOBA groups were paid back successfully. However, lack of training after the groups have been matured was noted as one of major limitation for optimum profit realization among COCOBA beneficiaries. Furthermore, the study revealed that, there was clear gender differences in the use of profit obtained. Men preferred to direct their profits in expanding their business while women use their profits to increase household's consumption such as buying food, clothes and other expenditure affecting family and child welfare.

5.2.3 Contribution of COCOBA to rural livelihood

The findings in this objective show that to a large extent COCOBA groups operating in villages neighbouring MMNP has brought positive changes in the standards of living of its members. This has been confirmed by both COCOBA members and non members accepted that there were benefits on receiving credit. A number of respondents interviewed considered themselves too poor to access financial services have been able to do so under this scheme. The study also revealed that there was difference in annual income between members and non members of COCOBA members being at high annual income of (1 546 057.56) compared to non members (828 045.35). Also the difference

between COCOBA members and non members has been justified by significant results at $p<0.05$. The general observation is that credit use contributed to increase in household income. Although COCOBA membership may not full moved members out of poverty, majority of respondents interviewed considered to be better off and in some cases lead to the ability to make choice and move away from dependency on unsustainable use of natural resources.

The improvement of livelihood of COCOBA members was further verified using study on total value of assets owned by members and non members in individual household. The findings revealed that there was no significant differences ($p>0.05$) between COCOBA members and non members on assets ownership. The reason identified is that COCOBA model was targeting to improve the life standard of poor people in the community. At the time of this study COCOBA model has helped members to meet their basic needs. This means that the amount gained through COCOBA was only enough for meeting household basic needs such as food, clothing, treating the illness and paying school fees for their children rather than purchasing household assets.

5.2.4 Participation of local community in environmental conservation

Moreover, the study identified the main mechanism in the study area used to improve environmental conservation which includes; tree planting on farms and around homestead, uses of improved stoves and beekeeping activities. Of those activities undertaken to the area, COCOBA members have been participated more in implementing environmental conservation activity compared to non members. The result indicates that, there was a significant difference between members and non members on tree planting programme participation and uses of improved stoves. Chi-square analysis indicates statistical significant of ($P< 0.05$) on the number of tree planted and uses of improved stoves.

That means the majority of COCOBA members planted many trees and uses improved stoves compared to non members. However, the study found that COCOBA members do not use effectively environmental fund provided for investing in environmental activities; this was attributed to the fact that environmental activities do not provide quick profit compared to other income generating activities.

Furthermore the study managed to identify socio economic factors that had significant effects on number of tree planted in the study area that include supply of free tree seedling and labour working in farm.

5.3 Conclusion

5.3.1 Socio-economic activities undertaken in the study area

On the basis of farming as a major socio-economic activity undertaken in the area, the study found out that the area is facing forest loss and land degradation due to clearance of forest in favour of farming as a major socio economic activity, shifting cultivation and uncontrolling fire. Also the study found that COCOBA discourages investing loan in farming because it is unfriendly environmental livelihood activities. Therefore there should be sensitization programme in the community to make sure that more people engaged in COCOBA groups to have diverse activities apart from agriculture.

5.3.2 Performance of COCOBA in the supported livelihood activities

These results shows that the success of COCOBA model depend much on different training provided to COCOBA members Therefore provision of initial training to any established and matured group is crucial and should not be compromised. Also the study revealed that majority of respondents was able to pay loan in time due to COCOBA regulations and internal social group pressure. Other significant finding was that; Women

were using their profits to increase household's consumption such as buying food, clothes and other expenditure affecting family and child welfare. Hence, strategies intended to improve family standard of living should be directed more to women.

5.3.3 Contribution of COCOBA to livelihood improvement

Based on the T- test results which shows that there was difference in annual income between members and non members of COCOBA members being at high annual income of (1 546 057.56) compared to non members (828 045.35). Also the difference between COCOBA members and non members has been justified by significant results at $p<0.05$ though the test shows no differences in assets ownership. It was concluded that credit utilization contribute to increase of household income.

5.3.4 Participation of local community in environmental conservation

Findings from environmental conservation analysis points to the conclusion that COCOBA members are participating more in environmental management than their counter part. This was attributed to the fact that members have more awareness on environmental conservation issues because COCOBA model provides different training on environmental conservation.

On environmental fund provided to COCOBA members, the study concluded that training on how to utilize environmental fund in activities with good return should be integrated in COCOBA model.

5.4 Recommendations

The success of COCOBA model depend much on pre- credit training provided and post - credit training which was not offered at the time of this study. Therefore COCOBA should

include post credit training in order to improve its performance. The areas identified include leadership development, financial and business management skills, entrepreneurship vocational training in pre and post harvesting activities that relate to alternative employment opportunity. In addition Government or supporting agency should find a way of continue supporting those groups at that stage

The government should earmark adequate financial resources particularly in rural areas for lending to micro credit institutions with low interest rate for the purpose of lifting their saving to meet borrower needs.

To improve the environmental soundness of growth, the component of environmental conservation should be integrated to any established credit institution. Also the Government should put more effort on supporting those institutions showing interest in environmental activities by providing fund or grants.

Government should undertake an information campaign in collaboration with relevant institutions to create awareness among the poor as to the availability and utilization of credit and greater understanding of policies, programmes and procedures relating to microfinance operations.

5.5 Area for Further Research

Since women constitute the largest majority of micro credit programme participants, there is a need to conduct a study to determine whether household members irrespective of sex and age, benefit equitably from increased income

REFERENCE

Aheeyar, M. M. (2006). Cash Grants and Microfinance in Livelihood Recovery in Tsunami affected areas of Sri Lanka: London. [http://www.odi.org.uk/hpg/ papers/BGP SriLanka cash_mfinance] site visited on 3/9/ 2009.

Ashley, C. and Carney, D. (1999). Sustainable livelihood: Lesson from early experience. London. *Journal of International Development* 23:10 - 29.

Bailey, B. K. (1994). *Methods of Social Research*. The MacMillan Publisher, New York. 813pp.

Bee, K. F. (2007). Rural financial markets in Tanzania: An analysis of access to financial services in Babati district, Manyara Region. Dissertation for Award of Doctor of Literature and Philosophy at the University of South Africa, Pretoria, South Africa. 322pp.

Butuyuyu, J. (2003). The impacts of economic incentives in afforestation activities in Same District, Kilimanjaro Region, Tanzania. Dissertation for Award of MSc Degree at Sokoine University of Agriculture, Morogoro, Tanzania. 79pp.

CGAP (2001). Microfinance Institutions Best Practices supervision in Bangladesh. [http://www.cgap.org/gm] site visited on 30/2/2009.

Chambers, R. and Conway, G. (1991). Sustainable rural livelihoods: Practical concepts for the 21st Century. *Journal of Development Studies* 296:100 - 112.

Douglas, R. and Terry, F. (2001). Development and the Role of Microfinance in Sub Sahara Africa. [http://www.highbeam.com/doc] site visited on 10/10/2009.

Ellis, F. (2001). *Rural Livelihoods and Diversity in Developing Countries*. Oxford University Press, Oxford. 220pp.

FAO (2005). Microfinance and forest based small scale enterprises. *Journal of Natural Resources Management* 46 (15): 26 - 35.

Gondo, P. C. (2009). The Role of Micro Financing in Sustainable Forest Management in Harare, Zimbabwe. [www.syngentafoundation.org] site visited on 23/10/2010.

Harrison, P. (2007). *Sustainable Livelihood Analyses and Threat Assessment in Priority Areas of the Mahale Ecosytem Report*. TANAPA and Frankfurt Zoological Society, Kigoma, Tanzania. 81pp.

ILO (2005). Saving Livelihood Saving lives, ILO-FAO Partnership in Post-Crisis Recovery report. Pakistan. [www.ilo.org/crisis] site visited on 5/9/2010.

Jacobsen, K. (2001). Microfinance as livelihood support for displaced people: The impact of microfinance program in Katumba refugee camp, Rukwa. *Journal of oxford 25(2): 23 – 39.*

Kajembe, G. C. (1994). Indigenous management system as a basis for community forest in Tanzania: A case study of Dodoma urban and Lushoto districts. *Journal of* Tropical *Resources Management* 6: 83 – 109.

Kessy, J. F. (1995). The use of PRA in monitoring forest Projects: Experience from Tanzania. *Journal of Forest Management* 2(1): 26 - 32.

Khandker, S. R. (1999). *Fighting Poverty with Microcredit*. The University Press Ltd., Dhaka. 78pp.

Lalika, M .C. S. (2006). The role of Socio economic incentives on biodiversity conservation in general lands of Uluguru mountains, Morogoro, Tanzania. Dissertation for Award of MSc Degree at Sokoine University of Agriculture, Morogoro, Tanzania. 98pp.

Likwelile, S. B. (2008). *Attacking Poverty in Tanzania: Context Processes Challenges and Lessons Report*. Government Printer, Dar es Salaam, Tanzania.60pp.

Luoga, W. P. (2008). Performance of group based semi formal credit on sustainable livelihoods of micro entrepreneurs: A case study of Pride Tanzania. Dissertation for Award of Masters Degree of Arts in Rural Development at Sokoine University of Agriculture, Morogoro, Tanzania. 119pp.

Machumu, M. E. (2001). Assesment of the impact of community participation on the conservation of mangrove resources: A case study of Lindi District, Tanzania. Dissertation for Award of Masters of MSc Degree at Sokoine University of Agriculture, Morogoro, Tanzania. 123pp.

Marconi, R. and Mosley, P. (2004). Perception of the impact of microfinance on livelihood security and Small enterprises. *Journal of Development Studies* 15 (3): 7 – 13.

Mbwambo, J. S. (2000). The role of local knowledge and organization in sustainable conservation of biodiversity: A case study of Uduzungwa mountains, Tanzania: Dissertation for Award of Masters of MSc Degree at Sokoine University of Agriculture, Morogoro, Tanzania. 119pp.

Mbwambo, J. S. (2007). Agrobiodiversity and food security among smallholder farmers in Ulugulu mountains, Tanzania. Dissertation for Award of Doctor of Philosophy at Sokoine University of Agriculture, Morogoro, Tanzania. 223pp.

MEMP (2008). *Mahale Ecosystem Management Project Annual Report.* Frankfurt Zoological Society, Kigoma, Tanzania. 40pp.

Meyer, R. (2001). Microfinance, Poverty Alleviation and Improving Food Security: Implication for India, Columbus, Ohio University. [http://www.redcamif. org/uploads/tx_rtgfiles/17India.pdf] site visited on 7/6/2010.

Mosley, P. (2001). Microfinance and poverty in Bolivia. *Journal of Development Studies*. 37(4): 101 - 132.

Mtatifikolo, F. (1994). *Development Challenges and Strategies for Tanzania: An agenda for the 21st Century: Economic Research Bureau Report*. University of Dar es Salaam, Dar es Salaam. 455pp.

Mugenda, A. G. (2008). *Social Science Research: Theory and Principles.* Kijabe Printing Press, Kenya. 344pp.

Munoz, C. and Christen, R. (2005). Grameen Shakti green microfinance primer on biodiversity primer on hotspots related documents: An overview of microfinance and environmental management: microfinance fights biodiversity Loss. *Journal of Forest Management* 51(8): 75 – 105.

Murth, Y. (2008). Micro Credit: Background and perspective, info change India news and features development news [http://www.grameen-info.org] site visited on 15/01/ 2009.

Mutatina, A. (2008). Impact of credit on rural livelihood of small farmers: A case study of Kagera agriculture and environmental management project. Dissertation for Award of Doctor of Philosophy at Sokoine University of Agriculture, Morogoro, Tanzania. 103pp.

Mwailafu, T. E. M. (2007). Assessment of quasi formal credit for poverty reduction: A case study of women and assessment of quasi formal credit for poverty reduction: A case study of women and youth development fund Nachingwea District, Lindi, Tanzania. Dissertation for Award of Masters Degree in Rural Development at Sokoine University of Agriculture, Morogoro, Tanzania. 81pp.

Nishat, A. (2007). Poverty and environment: Role of micro finance. *The World Conservation Union Journal* 70(9): 36 – 80.

Pretty, J. and Hugh, W. (2001). Social capital and the environmental: Contribution ofmicro credit on poverty alleviation. *Journal of Word Development* 29(2): 209 - 227.

Rajat, W. (2007). Micro Finance in India: The changing face of micro credit schemes Gurgaon, India. [http://www.microfinancegateway.org/gm/document] site visited on 15/07/2009.

Rubambey, G. (2001). Tanzania national microfinance policy at White Sand Hotel 2000 – 2001. In: *Proceedings of The Fifth Annual International Conference on Entrepreneurship and Small Business Development*. (*Edited by ICAESB*), 10 – 13 August 2001, Dar es Salaam. pp.17 – 23.

Scoones, I. (1998). Sustainable rural livelihood: A framework for analysis. *Journal of Development Studies* 72 (2): 22 - 50.

Torell, E., Baraka, K., Renalda, M., Shalli, M. and Brian, C. (2007). *Integrated Coastal Management, Livelihood Development and Micro Loan Strategies: The Case of the TCMP-FINCA Partnership in Bagamoyo District of Tanzania*. University of Rhode, Island. 80pp.

URT (1998). *Kigoma Region Socio Economic Profile, Planning Commission Dar es Salaam and Regional Commissioner's Office*. Government Printer, Kigoma 188pp.

URT (2008). *National Economic Survey 2007 Report: Ministry of Finance and Economic Affairs*. Government Printer, Dar es Salaam. 176pp.

URT (2000). National Microfinance Policy: Ministry of Finance. Government Printer, Dar es Salaam. 30pp.

URT (2002a). Tanzania Census, Regional and District Profile Population Housing Census: National Bureau of Statistics, Ministry of Planning, Economy and Empowerment. Government Printer, Dare es Salaam. 203pp.

URT (2002b). *National Bureau of Statistics Tanzania: Household Budget Survey 2000 - 2001 Report*. Government Printer, Dar es Salaam. 188pp.

URT (2003). Small and Medium Enterprise Development Policy, Government Printer, Dar es Salaam.42pp.

URT (2005). National Strategy for Growth and Reduction of Poverty. Government Printer, Dar es Salaam. 111pp.

Wild, R., Milinga, A. and Robinson, J. (2008). *Microfinance and Environmental in Tanzania and Kenya Report.* Care International, Nairobi, Kenya. 32pp.

World Bank (1993). *World Development*: *Development and Evaluation Report.* Edward Science Ltd., Washington, USA. 215pp.

Wydick, B. (2005). Microfinance among the Maya: Tracking the progress of borrowers. *Journal of International Development* 16(6): 131 – 152.

APPENDICES

Appendix 1: Household Questionnaires

Introduction and Instruction

Greetings! My name is ……from Sokoine University of Agriculture. Currently I am conducting a research on "Micro credits and rural livelihood for sustainable conservation." Therefore, the information you are about to provide is for this purpose and will remain confidential. As a member of this community I kindly request you to accord your time and use it to respond to these questions. This will be highly appreciated.

Do you have any question before we start?

Questionnaire for COCOBA beneficiary

A. General Information

Ward_____ Village_____ Questionnaire No; _____

Date of Interview_____ Number of Respondent_____

B. Household characteristics

Person	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
1. Sex										
2. Age										
3. Marital Status										
4. Years of schooling										
5. Type schooling										
6. Main occupation										
7. Work on farm										
8. Household head										

Key:

Sex	**Year of Schooling**	**Marital status**	**Main occupation**	**Work on farm**	**HH head**	**Type of Schooling**
1.Male	1.None	1.Single	1. Crop production	1.Full time	1.Adult male	1. Public
2.Female	2.Primary	2.Married	2. Fishing	2.Part time	2.Adult female 3.Child	2. Private
	3.Secondary	3.Widow	3. Livestock keeping 4. Small-scale	3.None	headed HH	
	4. Post secondary	4.Widower	business			
	5.Adult education	5.Divorced	5. Employee			
	6. Higher education	6.Separated	6. Other ……			
		7.Others				

B9. What is the distance from your resident to MMNP in hours?

C: Production and use of input

C1. Do you own land for agriculture purpose? 1. Yes 2. No ( )

C2. If no, do you rent? 1. Yes 2. No ( )

C3. Total farm size

1. ½ acre to 1 acre
2. 1 acre to 3 acres ( )
3. 3 acres to 10 acres
4. 10 acres and above

C4. Actual farm size in use…….

C5. Indicate type of labour employed in farm work

1. Family labour
2. Hired labour ( )
3. Others (specify)……..

C6. What type of food do you grow?

a) Food crops

1……..

2. ……

3…….

b) Cash crops

1…….

2…….

3…….

C7. Which type of seeds do you mainly use in crop production?

1. Local seeds ( )
2. Improved seeds

C8. What type of manure do you use in most cases on your farm?

1. Organic manure
2. Inorganic fertilizer ( )
3. Both a and b
4. None

C9.Amount and value of crops produced in last cropping season

Crop	Amount produced (Kgs)	Value of crops produced

C10. Do you keep livestock? 1. Yes 2. No ( )

C11. If yes, what type of livestock do you keep

1. …….
2. …….
3. …….

C12. Name the livestock produce you obtained

Livestock	Quantity	Value of the livestock

C13. Do you fish? 1. Yes 2. No ( )

C14. If yes, what type of fishing are you doing?

1. Sardine (Dagaa)
2. Fish
3. Both

C15. What type of fishing equipment you are using?

……

C16. Amount and value of fish obtained last season

Type of fish	Amount (kg/ bucket..) obtained	The value of the product

C17. Where do you get capital for the above activities?

1. Loan from COCOBA
2. Loan from other microfinance institution ( )
3. Friends
4. Selling produce
5. Both 1 and 4

D: SOURCE OF INCOME

D1.What is your major source of income?

1. Sales of food crops
2. Sales of cash crops
3. Sales of livestock and its product ( )
4. Wage employment
5. Selling of fish/sardine
6. Others (specify)……

D2. Do you have any off-farm income generating activities? 1. Yes 2. No ( )

D3. If yes, mention them and indicate income estimates realized from those activities

S/N	Off- farm activities/sources	Estimated income per day (per bag/kg/bucket)
1		
2		
3		
4		
5		

D4.What is your average income?

Per day ……Tshs.

Per week …….Tshs.

Per month …….. Tshs.

Per year …… Tshs.

E: COCOBA INFORMATION AND PERFORMANCE

E1. How did you learn about COCOBA? Give the source of information

…….

E2. Indicate the reasons that influence you to join COCOBA group?

….……

E3. Indicate the reasons that influence you to take loan

1. Loan size
2. Interest rate
3. Type of collateral required ( )
4. Both
5. Others(specify)

E4. What conditions attached to credit that you get

……

E5. What is the interest rate for the loan you received ……?

E6. Is the interest rate charged by COCOBA?

1. Very high
2. High ( )
3. Reasonable
4. Low

E7. Were you trained on the credit utilization before given credit?

1. Yes 2. No ( )

E8. What type of training did you receive? ……..……

E9. Did you utilize credit obtained from the COCOBA for the purpose acquired?

1. Yes ( ) 2.No ( )

E10.If no, what was your major hindrance for not utilizing the credit for the purpose acquired?

1. Urgent ceremonial needs
2. Late receipt of loans
3. Urgent consumption needs ( )
4. Pressing household needs
5. Others (specify)……

E11. Is the loan paid successfully? 1. Yes 2. No ( )

If No, why not (specify the reason)……

E12. What sort of penalties is imposed by the group for late payment or failure to pay?

…….

E13. How much cash/ or other benefits did you save/ realize after loan repayment?

……..

E14. What do you think has been the change in your income position since joining COCOBA?

1. Improved
2. Unchanged
3. Deteriorated ( )
4. No response

E15. If the answer in question above is the first choice, what do you think is the reason for this improvement?

1. Additional employment in productive work
2. Additional investment in off and on-farm activities ( )
3. Free from the clutches of money lenders
4. Others…….

E16. Did you obtain credit from other sources than COCOBA? 1. Yes 2. No ( )

E17. If yes, what was the source of that credit? .....

E18. What are the main problems facing you in running the activities?

a)……

b)……

E19. What are the activities that have been supported by the money borrowed from COCOBA?.....……

E20. In the table below, kindly indicate the income that is associated and not associated with COCOBA respectively

Source of Income (Specify the duration e.g. for on-farm – last season, for off-farm – past three months**)**	**Income Associated with COCOBA**		**Income not Associated with COCOBA**	
	Amount (Kgs/bags/tin/pcs)	**Estimated Cash Income**	**Amount (Kgs/bags/tin/pcs)**	**Estimated Cash Income**
Shopping				
Selling fish and sardine				
Food vendor (plates)				
Selling maandazi/chapatti				
Rice				
Maize				
Dawa baridi				

F; HOUSING AND ASSETS OWN

Type of Household

F1. Do you own a house? 1. Yes 2. No ( )

F2. If No, where do you reside?

1. Rented house
2. Relatives' house ( )
3. Neighboring house

F3. If you are renting, how much do you pay per Month Tshs ……..

F4. Household Condition (tick the appropriate answer)

Type of wall	1. Mud+ Wood + Thatch 2. Wood + Mud + Cement 3. Bricks (Non heated) ( ) 4. Bricks (heated) 5. Stones + Cement
Type of floor	1. Mud floor 2. Cemented floor ( )
Type of roof	1. Thatch, Thatch + mud 2. Iron Sheets ( )
Type of toilets	1. None 2. Pity hole type ( ) 3. Modern type

F5. Indicate number of assets owned by the household

No.	Assets	Type of Assets	Number of assets owned		Current price	Who own the assets
			Assets associated with COCOBA	Assets not associated with COCOBA		
1	Transport	-Motor cycle				
		-Bicycle				
2	Farm Implements	-Land (Farm)				
		- Axes				
		-Hand hoe				
		- Tractor				
		- Racks				
		- Wheel barrow				
		- Machetes				
3	Fishing equipment	- Wooden Boat				
		- Boat engine				
		- Fishing nets				
4	Kitchen facilities	- Charcoal cooker				
		- Chairs				
		-Table				
		-Utensils				
5	News Media	- Radio				
		- TV				
		- Generator				
		- Satellite dish				
6	Household assets	- Solar pannel				
		- House				
		- Gliding Machine				

F6. Do you think your family living standard is improving? 1. Yes 2. No ( )

F7. If yes, would you associate improvement with COCOBA 1. Yes 2. No ( )

Explain how…….

If No, what are major constraints facing your family's development

1. ……
2. ……..

F8. What is the major source of food for your household?

1. Own farm
2. Purchase ( )
3. Both
4. Others (specify)……

F9. How many meals does your family take per day

1. Three meals
2. Two meals

F10. What is the most difficult time of year for you and why?

……

F11. How do you manage during those difficult months?

……..

F12. How do you manage during those difficult months?

1. Assistance from friend/neighboring/relatives
2. Own saving
3. Borrowing from friend/neighbors
4. Government support
5. None

F13. Have there been any shocks affecting the community 1. Yes 2. No ( )

F14. What are these shocks?

1. Drought
2. Floods ( )
3. Diarrhea
4. Earthquake

F15. How do you cope with those shocks?

…….

F16. Do you have access to Health services 1. Yes 2. No ( )

F17. If yes, what is the type of Health Services?

1. Traditional
2. Public ( )
3. Private

F18. How far is the health centre from your household?…….. (Km/walking hrs)

F19.How many times do you visit Health centre in a month…….

G; STRATEGIES FOR ENVIRONMENTAL CONSERVATION

G1. What are natural resources obtained in your village (show their values whether is for direct sale or home utilization)

1……..

2…….

3……

G2.Are natural assets reducing? 1. Yes 2. No ( )

G3. What is the cause of the loss of biodiversity (Tick the mostly appropriate answer)

1. Unplanned cutting of trees
2. Lumbering
3. Poaching ( )
4. Wildfire
5. Overgrazing
6. Illegal fishing

G4. Where do you go if there is a loss of assets/when natural resources become scarce in your neighboring

1. Buying
2. Forest far from my village
3. Others (specify)

G5. Do you participate in environmental conservation through any of the undersigned activities? (Use 1 for the mostly used, 2 the next….until 5 in order of priorities)

1) Tree planting on farms and round the house
2) Construction of fuel efficient stoves
3) Beekeeping
4) Private forest reserve ( )
5) Agroforesty
6) Others …….
7) None

G2. Do you retain and/or plant trees? 1. Yes 2. No ( )

G3. If yes, how many retained trees do you have? ……..

G4. How many planted trees do you have? …….

G5.Where do you get tree seedling for planting?

1. MEMP office
2. TACARE office
3. In the forest
4. Purchase from business people
5. Grown myself
6. Others (specify)…….

G6. How do COCOBA facilitate your effort in tree planting?

1. Awareness and training in tree planting

2. Provide seedling
3. Provide cash to purchase seedlings
4. It is not involved in tree planting
5. Others (specify)…….

G7. What type of cooking energy do you use?

1. Firewood
2. Charcoal ( )
3. Kerosene
4. Both

G8. Where do you get firewood and building materials? ……

G9. Do you use fuel efficient stove in your household? 1. Yes 2. No ( )

G10. If no, why not……

G11. If yes, to what extent do you save the use of firewood/charcoal?

1. Highly
2. Medium ( )
3. Low
4. Same as before

G12. Do you think the use of fuel efficient stove has benefit in the environment? 1. Yes 2. No ( )

G13.If yes, what are those benefits?…… ……

G14. Do you participate in Beekeeping activities? 1. Yes 2. No ( )

G15. What type of hives do you use?

a) Traditional hives
b) Modern hives
c) Both a and b
d) Others (specify)……..

G16. Have you received training on Beekeeping? 1. Yes 2. No

G17. If yes, what type of training did you receive? (Tick)

a) Making modern hives

b) Honey Processing and packaging

b) Candle making

c) Identifying favourable area for beekeeping

d) Others (specify)

G18. Is there any organized group in your village working together for common purpose?

1. Yes 2. No ( )

G19. From the list below, tick the group or association which exist in your community

1. Fisherman group
2. Cooperatives (SACCOS)
3. Farmer group
4. Credit/finance group eg. COCOBA
5. Forest management group
6. Religious group
7. Political association
8. Women's group
9. People living with HIV/AID
10. Other group or association (specify)

…….

G20. Of the identified groups, how many are active groups……

G21. Are there any groups that were created specifically for the accessing credits and improving environment

1. Yes

2. No

G22. Name the group (S)…….Year created……

G23. Are groups identified above formally recognized by the Local Authorities?

1. Yes
2. Not sure
3. No

G24. For your own opinion, what is your suggestion in environment conservation in relation to COCOBA? ……

25. For your own opinion, what alternative livelihood do you think can reduce pressure on resources but boost income ……

Thank you very much for your cooperation

Appendix 2: Checklist for Focus Group Discussion

1. For your own opinion do you think COCOBA was established in the area in proper way? 1. Yes 2. No
2. If No, give reasons.....
3. Do you think, COCOBA enables people to come out of poverty? 1. Yes 2. NO
4. If yes/No, give reasons of your answer…….
5. What kind of people in the village between COCOBA members and non members are participating in Environmental Conservation activities? (Mention them)

   ……..

   Why? ……

   Do you think the uses of fuel efficient stoves helps in improving environmental conservation in the area? 1. Yes 2. No If yes, how----------Are there any benefits by becoming COCOBA member? 1.Yes 2.No

   If yes, what arethey……

   ……

Thank you for your cooperation

Appendix 3: Checklist for Key informants (COCOBA staffs)

H1. Location: Ward…….Village…….Position……..

H2. Age

H3. Sex

H4. Level of education

H5. What are the objectives of COCOBA

H6. Do you think the objectives of COCOBA are fulfilled? 1. Yes 2. No

H7. If yes, to what extent have been achieved? Explain …….

H8. If no, why? .....

H9. Mention the source of initial capital……..?

H10. Was there any fund/grant obtained to subsidize the capital investment?

1. Yes 2. No

H11. If yes, name source of fund and amount obtained? ……

H12. What measure/action taken to ensure money safety?

H13. What kind of training are provided to group members (mention) ……..

H14. Do you think the training provided is useful to group members in fulfilling COCOBA Objectives? 1. Yes 2. No

H15. What are the collateral requirements that the borrower must fulfill before securing the credit

H16. Mention the credit modalities used to ensure effective repayment?

H17. Indicate interest rates charged for different types for credit?

H18. Do you think COCOBA is sustainable? 1. Yes 2. No

H19. What are the mechanisms for sustainability of COCOBA?

H20. Do you think COCOBA facilitates the improvement of environmental conservation? 1. Yes 2. No

H21. If yes, How (explain)…….

Appendix 4: Checklist for Government Leaders and TANAPA staffs

1. What should be done to make sure that more people join COCOBA?

   …….

2. What do you think can make COCOBA more sustainable?

   …….

3. For how long have you been working in this area? …….

4. Are you aware of the presence of COCOBA and its objectives in your area?

   1. Yes 2. No

5. For your own opinion, do you think COCOBA have influence on people's livelihood and environment? 1. Yes 2. No

6. If yes, (give reason)……..

7. If no, (give reasons)…….

8. What should be done to make sure that more people join COCOBA?

   …….

9. What do you think can make COCOBA more sustainable?

   ……

Thank you for your cooperation