AFFORESTATION FOR MITIGATING AGAINST LAND DEGRADATION ON KILIMANJARO HIGHLANDS, KIBOSHO WEST WARD, MOSHI RURAL DISTRICT

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS IN COMMUNITY ECONOMIC DEVELOPMENT OF THE OPEN UNIVERSITY OF TANZANIA

2011

CERTIFICATION

I, Dr. James Kisoza, certify that I have read this work titled "**Afforestation for Mitigating Against Land Degradation on Kilimanjaro Highlands, Kibosho West Ward, Moshi Rural District**" and found it to be in form acceptable for submission. I hereby recommend it be accepted for partial fulfillment of the requirements for masters degree in Community Economic Development of The Open University of Tanzania.

…….

Dr. James Kisoza

Supervisor

Date……

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DECLARATION

I, Godson, Arestarico Ulomi, declare that this dissertation is my own original work and it has never been submitted and will not be presented for the similar degree in any other University.

……..……

Godson, Arestarico Ulomi

Date……

DEDICATION

I dedicate this dissertation and its fruits first of all to God and second to my beloved Mother Frida Ulomi and lastly my wife Mary Matella and my children Collins and Gift. They all displayed a highly valuable sense of pray and patience during my study and they were always a source of encouragement throughout my life.

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ABSTRACT

An afforestation for project mitigating against land degradation was implemented on Kilimanjaro highlands, as a result of the community need assessment conducted in Kibosho West ward September, 2010. The data were collected through focus group discussion, interviews, questionnaires, survey, secondary data reviews and observation. Results indicate that land degradation was brought by deforestation. To address the issue of deforestation, goal and objectives were set through involving stakeholders. Implementation was conducted following the needs assessment which indicated what interventions to undertake to achieve the intended goals and objectives. Through socio-economic survey two strategies to tackling the problem were identified, the first was the awareness creation and capacity building for community members and Village leaders and second was tree seedlings production and tree planting by community members. During project implementations training on tree nursery operation at grass root level was conducted. Implementation results show that tree nurseries groups were formed and a number of tree nurseries increased from 1 to 44 with a total of 151,000 tree seedlings. It was recommended that the Moshi Rural District Council to establish sustained afforestation programmes.

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LIST OF ABBREVIATIONS

CBFM - Community based forest management

CBO - Community based organization

CDTF - Community development trust fund

CED - Community Economic Development

CNA - Community needs assessment

DCFM - District Catchment forest manager

DFO - District forest officer

FAO - Food agriculture organization

FGD - Focus group discussion

GDP - Gross domestic product

JFM - Joint forest management

MCED - Master in community economic Development

MDGs - Millennium Development Goals

MP - Member of Parliament

NAP - National action plan

NEMC - National Environmental management council

NGO - Non-governmental organization

NLUPC - National Land use plan commission.

PAME - Participatory monitoring and evaluation

PNA - Participatory needs assessment

PRA - Participatory rural appraisal

SLM - Sustainable land Management

SPSS - Statistical Package for the Social Sciences

SSI - Semi structured interview

SWOT - Strengths, weakness, opportunities and threats

TIP - Traditional irrigation improvement program

UNDP - United National Development programme

URT - United republic of Tanzania

VEO - Village executive officer

WEO - Ward executive officer

WVT - World vision Tanzania

CHAPTER ONE

1.0 PARTICIPATORY NEEDS ASSESSMENT

1.1 Introduction

Participatory needs assessment is a way of understanding the needs of a local community (Apirna, mindy and Yolanda, 2000). The overall aim of the participatory needs assessment is to understand the environmental needs of the community from their own perspective rather than from the provider's view point. A participatory needs assessment process gives voice to environmental issues of local community while creating the capacity for sustainable community dialogue on development and evaluation of interventions, and re-assessment of needs. This chapter describes the participatory needs assessment conducted at Kibosho West ward in relation to environmental degradation issues. This community assessment was conducted in September, 2010 in five villages, Moshi rural district in Kilimanjaro region.

The main concept of conducting the participatory needs assessment was to identify areas of environmental concern and major issues which needs to be addressed in order to improve the vegetation cover and to reduce environmental degradation.

1.2 Community Profile

Moshi Rural is one of the six districts in the Kilimanjaro Region of Tanzania (Appendix 2). It situated at Latitude of 3° 15′ S and Longitude of 36° 45′ E. It covers an area of 1,713 square km equivalent to 39% of total area of the Kilimanjaro region. Moshi rural District lying on foot slopes of Mountain Kilimanjaro and is administratively divided into 31 Wards (District Commissioner office, 2008).

1.2.1 Demographic Data

Generally, according to national census for people and settlement (National censer, 2002), District has a population of 402,431 people. The annual growth rate is estimated to be 1.9% and the population density of 281 per square kilometer (one of the highest population density in the country), an average household size of 5.6 people.

1.2.2 Environmental Factors

The Kilimanjaro Region has typically two distinct rainfall seasons; November to December and March to May. The region faces significant risks from climate change, with a rise in mean temperature, a decrease in annual precipitation and an increase in variability with the rainfall patterns becoming increasingly uni-modal (Regional commissioner office, 1998). These occurrences have increased the vulnerability as farmers may have less water available for crop cultivation.

1.2.3 Farming Activities

The farmers practice agro-forestry using multipurpose trees to provide shade for coffee, as live fences, for fodder and mulch production. Over the centuries the Chagga people have evolved a unique multi-storied farming system. Commonly referred to as the “Chagga home garden”, the system integrates trees/shrubs with food and cash crops and livestock on the same land unit. The major cash crop is coffee, grown together with bananas under tree shade canopies. This is grown together with a lower ground cover of food crops, medicinal plants and annual fodder plants, often together with zero grazed dairy cattle. Although the farms are small,

they are rich in diversity and reduce vulnerability from crop failure by offering alternate food and livelihood sources.

1.2.4 Socio-economic context

Kilimanjaro region include Moshi rural ranks higher than many parts of the country in terms of socio-economic indicators such as rural electrification network, water supply as well as availability of health and education services. Despite these indicators, the region is still among the most deprived in terms of GDP per capita, ranking third from the bottom (URT, 2002), a scenario attributed to the downfall of the coffee industry (Regional commissioner office, 1998).

Kilimanjaro land tenure especially in the coffee belt or the Chagga home gardens is regulated by customary law, where transfer or change of ownership is ruled by inheritance patterns (with ownership passing to sons). The increase in population, coupled by the high dependence on agriculture for economic activities, led to frequent sub-division and smaller plot sizes, which are becoming increasingly economically unviable.

A major problem associated to Kilimanjaro land tenure system is growing number of abandoned farms and aging farm labour as the young population and beneficiaries of education migrate to urban areas (Angela, 2009). These changes have resulted to decreased farm productivity, declining coffee quality and consequently low income from coffee. The situation was further compounded by mismanagement of cooperatives, with farmers not getting their payment in time, compounded by unfair pricing systems (Regional commissioner office, 1998). As a result, many farmers

shifted from the agroforestry based home garden system to annual cash/subsistence crops (e.g. maize, beans, and tomatoes) which need less shade. This necessitated clearing of coffee and other shade trees, without replacing the tree based system with equivalent soil fertility management systems. Thus soil was left bare for longer periods with consequent run-off that have led to severe land and forest degradation in the region.

1.3 Community Needs Assessment (CNA)

The United Way of America, (1982) defined Community need assessment as a systematic process of collection and analysis as inputs into resource allocation decisions with a view to discovering and identifying goods and services the community is lacking in relation to the generally accepted standards, and for which there exists some consensus as to the community's responsibility for their provision. According to Apirna, Mindy and Yolanda, (2000) defined CNA as a process of "ordering and prioritization of community needs. The concept of community needs assessment can be express as a process by which an assessment of the current situation in the community is undertaken, value-based judgments regarding the preferred or desired situation are reached, and some determination of the priority status of local needs is made.

1.3.1 The Overall Objective of Community Needs Assessment

The study was aimed at collecting information and data with regard to land degradation and environmental stress, causes and its magnitude. The community opinion and findings would equip setting priorities and assist LEPAJE CBO to review planning with practical information useful for decision purposes.

1.3.1.1 Specific Objectives

The study specifically focused on the following objectives:

(i) To identify the community environmental stress and knowledge gap.

(ii) To explore the actual status and extent of the environmental degradation

(iii) To identify opinion from the communities on how to improve the situation.

1.3.2 Study questions

Questions involved during CNA study (Appendix, 1) mainly include the following;

(i) What is the main environmental degradation?

(ii) What are the factors which lead to environmental degradation?

(iii) What are the opportunities available to improve the situation?

1.3.3 Research Methodology

Research methodology described by Kothari, (1990) as systematically way of solving research problem. This section presents the methodology of the study. It starts by describing the preliminary study and pilot visits which the researcher did before embarking on the main research. Then it describes the research design, sample size and sampling procedure, the research methods and instruments, the data collection and data analysis methods.

1.3.3.1 Preliminary study

The initial attempt to begin this study was the researcher to conduct preliminary studies and pilot visits to the study area in order to familiarize himself with the study environment. Specifically these visits and studies were intended to enable the researcher to get " a bird's eye view of the environment and informally meet some

of the unit of analysis for creating rapport and at the same time getting relevant information regarding to environmental degradation. It is from this background that the researcher identified and established a base for the choice of samples.

1.3.3.2 Research Design

The study used qualitative and quantitative approaches. A qualitative approach attempts to understand the behavior of the people in the community by getting to know them and their values. A quantitative approach dealt with operationalization of empirical variables. This study employed a case study design, because a case study is not a single qualitative techniques but it uses several methodologies referred to as triangulation. This approach involves application of different data collection methods in order to understand cause, effect and solution of any possible environmental degradation. This methodology is appropriate, because the intension was to conduct an in-depth analysis of environmental stress its causes and consequences.

1.3.3.3 Sampling Techniques, and Sample Size

1.3.3.3.1 Sampling Techniques

Krishnaswami, (2002:143) define sampling as the process of drawing a sample from a larger population. Therefore, it is a process of obtaining the number of elements about which one would wish to make inferences. Random sampling was used in this study, in order to be able to draw valid inferences from a sample in relation to its respective population. A simple random sampling is a way of selecting subjects in which every element in the population has an equal chance of being chosen (Sekaran, 2003: 270). Therefore, the researcher selected the samples from the sample frame

using random numbers. The sample frame of a list dissertation of household heads in the study area was obtained in the Village office during preliminary study.

1.3.3.3.2 Population and sample size

Krishnaswami, (2002:143) define population as the target group to be studied in a particular place while a sample is a part of the population. The population therefore is a total collection of elements about which one wishes to get information. Samples are used in research as representative of the whole population because of cost in terms of time, materials and financial resources.

The total population in this study comprised of 255 households from Kifuni juu Village. However, due to time and financial constraints, a sample of 46 of the households was selected, which was approximately 18% of the total population. This is in line with Krishnaswami (2002:144) who recommends a population sample of approximately 30% as being representative enough of the entire population. The size of the sample was large enough and representative of the population. When the sample is large enough it will provide results that reflect the population (Cochran, 1977:81).

1.3.3.3.3 Data collection methods

According to Krishnaswami (2002:197) data are facts, figures and other relevant materials, past and present that serve as bases for the study and analysis. He further states that data may be classified into primary and secondary sources. In this study primary data was collected using different methods including: interviews,

observation, household survey and Focus Group Discussions. Tools and techniques used includes a semi- structured questionnaire, a checklist and hand held camera. Secondary data were collected through documentary reviews.

1.3.3.3.3.1 Focus Group Discussions method

Focus group discussion is a form of structured group discussion involving people with knowledge and interest in a particular topic and a facilitator. Focus groups provide an opportunity to discussion thoroughly on the desired topics (Kothari, 1990). The focus group discussion was carried out by the researcher to groups of 15 members composed by males and female selected randomly by village leaders. The essence of FGD was to understand people knowledge, attitude, skills and feelings towards environmental degradation and afforestation. The discussions were carried out using focus group discussion moderators who were oriented and instructed to follow rules of carrying out FGD. The Focus Group Discussion was guided by a checklist prepared in advance (Appendix, 3).

1.3.3.3.3.2 Individual interview

Five staffs from local authority and institutions were interviewed using an interview guide (Appendix 4) that had questions intended to extract information regarding the environmental problem especially deforestation, extent of the problem, causes and measure taken to address the problem. Staff interviewed includes DFO, DCFO, KINAPA Officials, ZEOs and Ward extension officers.

1.3.3.3.3.3 Participant Observation

Observation is essential in making a correlation of the questionnaire response to the actual phenomenal on the ground (Kothari, 1990). Environmental degradation was

observed in term of soil erosion, soil fertility, deforestation, destruction on water catchment and fuel wood shortage.

1.3.3.3.3.4 Questionnaire Survey method

Prepared questionnaires (Appendix, 1) with a set of questions relevant to the study objectives were used to collect data from the selected household. A total of 46 respondents which is 18% of the total households were interviewed in relation to the topic under discussed.

1.3.3.3.5 Secondary data collection

Krishnaswami (2002: 203) define secondary data as sources which have been collected and compiled for another purpose. This method was used to collect data from various office documents such as reports, files, articles, journals and others available related sources from LEPAJE and Moshi rural district council. Also other information was collected through the websites. The use of secondary data broadens the data base from which scientific generalizations can be made (Kothari, 1990: 164).

1.3.3.4 Data Analysis Method

Data analysis means the computation of certain measures along with searching for patterns of relationships that exist among the data group (Kothari, 1990: 160). In this study data collected in each questionnaire were cleaned coded and analyzed using SPSS software package. Ms excel was used for analysis of information obtained in numerical form. Descriptive statistics giving frequencies and percentages were

presented in various forms particularly by using tables, graphs, charts and percentages.

1.4 Community Needs Assessment Analysis and Findings

This section presents the analysis and findings that were obtained through questionnaires, interviews, observation and focus group discussion. The findings are based on the objectives of the study.

1.4.1 Awareness of Community on Environmental Degradation

Most of the respondents were aware of environmental degradation (87%) and they were ready to take action against the environmental degradation (Table, 1). Only 13% of respondents were not aware of environmental degradation. There is therefore a need of creating awareness to the community so that they can understand the importance of tree planting and environmental conservation.

Table 1: Awareness of community on environmental degradation

Awareness	Frequency	Percent
Yes	40	87.0
No	2	4.3
Not sure	4	8.7
Total	**46**	**100**

Source: Own survey data (2010)

1.4.2 Tree planting activity by community

The majority (97.8%) of respondents were involved in tree planting activities, and they already planted trees in their farms (Table, 2). This implies that there is a high commitment and willingness of the people in tree planting initiatives.

Table 2: Tree planting activity by community

Status	Frequency	Percent
Yes	45	97.8
No	1	2.2
Total	**46**	**100.0**

Source: Own survey data (2010)

1.4.3 Level of community involved in tree planting by Local Government

According to respondents, (69.6%) mentioned the involvement of local Government in tree planting activities was very low, only 30.4% mention as it was average (Table, 3). This implies that effort of tree planting is by the initiatives and commitment of community alone and not government and other stakeholders' effort. There is a need of harmonizing different stakeholders to participate in tree planting and to support the efforts of community.

Table 3: Level of community involved in tree planting by Local Government

Level	Frequency	Percent
Low	32	69.6
Average	14	30.4
Total	**46**	**100.0**

Source: Survey data (2010)

1.4.4 Farm hold characteristics

A large number of respondents (47.2%) own less than 1 acre of land for farming activities which is the same area competing for tree planting as well as other social development activities, this was followed by 30.6% of respondents having 1-2 acres

of land (Table, 4). From this situation, it is seen that people are willing to plant trees and conserve the environment but they do not have enough land for tree growing. There is a need therefore to educate farmers to practice Agro forestry as well as to plant tree along the road and along the river bank.

Table 4: Land size owned by respondents for farming and other development activities

Size of land	Number of respondents	Percent
<1acre	20	47.6
1-2acres	16	38.2
2-4acres	5	11.9
4-5acres	1	2.3
More than 5acres	0	0
Total	**42**	**100**

Source: Own survey data (2010)

1.4.5 Availability of Seedlings for Planting

During the Focus Group Discussion most of member of the group explain the problem of availability of tree seedlings. This was reveal by the interviewers, where by 54.4% of the respondents said they obtained tree seedling from the forest or under big trees for planting. 26.1% of the respondent bought seedlings from town and only 19.6% of the respondents where getting seedlings free from a CBO (Fig, 1). This shows that within the study villages, the production of seedling is low compared to the high demand. There is a need therefore for establishment of more tree nurseries in the study area in order to meet high demand of seedlings by community members.

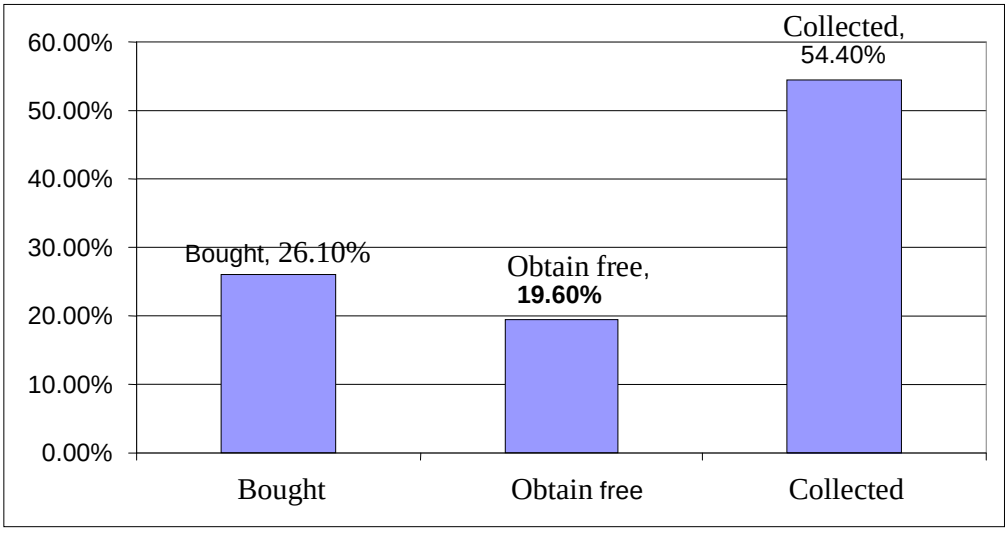

Figure 1: Availability of tree seedlings

Source: Own survey data (2010)

1.4.6 Training on Tree Planting Management

According to respondents most of them (80.4%) have never attended any kind of training on tree growing and related subject (Table, 5). On the other hand technical knowledge obtained by few tree growers does not have trickledown effect. By this it means that more efforts are needed on technical Know-how on tree planting and management as well as seedling establishment.

Table 5: Training provided associated with tree planting

Status	Frequency	Percent
Yes	9	19.6
No	37	80.4
Total	**46**	**100.0**

Source: Own survey data (2010)

1.4.7 Factor Affecting the Efforts of Tree Planting

Most of the respondents (43.5%) mentioned land shortage as the main factor hindering development of trees planting, followed by other factors such as insufficient knowledge on tree planting (21.7%), lack of seedlings (19.6) and limited access to credit (15.2%) (Table, 6). There is a need of provision of extension education and training related to tree planting and increasing production of seedling through establishment of more tree nurseries.

Table 6: Factor which affect the efforts of tree planting

Factor	Frequency	Percent
Lack of seedlings	9	19.6
No enough land	20	43.5
Insufficient knowledge	10	21.7
Limited access to credit	7	15.2
Total	**46**	**100.0**

Source: Own survey data (2010)

1.4.8 Perceived environmental status in the study area

Most of the respondents (43.5%) were worried about the status of environment and said that it's in poor condition, while 47.8% of respondents said it's an average, only a few (8.7%) said that they were enjoying the environment and it's still good quality (Table, 7). Since a higher percentage of respondents argues that, the environment is in poor conditions there is a need of improving the situation especially through tree planting and increase the vegetation cover.

Table 7: Environmental status in study area

Status	Frequency	Percent
Good	4	8.7
poor	20	43.5
Average	22	47.8
Total	**46**	**100.0**

Source: Own survey data (2010)

1.4.9 Main Environmental Problems in the Study Area

Results in Table 8 show that, most of respondents (37%) said that the main environmental problem is deforestation, destruction of water sources (34.8%), loss of soil fertility (15.2%) and soil erosion (13%). Since loss of vegetation cover was rated high there is a need to plant trees so as to increase vegetation cover as well as to plant more trees on the river bank and catchments areas.

Table 8: Main environmental problems in the study area

Problem	Frequency	Percent
Deforestation	17	37.0
Loss of soil fertility	7	15.2
Destruction of water sources	16	34.8
Soil erosion	6	13.0
Total	**46**	**100.0**

Source: Own survey data (2010)

1.4.10 Factors Leading to Environmental Degradation

According to respondents (Table, 9), factors which lead to environmental degradation include; high population (41.3%), deforestation (37%) and poor farming practices (13%).

Table 9: Factors leading to environmental degradation

Factor	Frequency	Percent
Deforestation	17	37.0
Poor agriculture practices	6	13.0
High rate of population	19	41.3
Poverty	4	8.7
Total	**46**	**100.0**

Source: Own survey 2010

1.4.11 Perceived extent of deforestation in the study area

The results in Figure 2 shows perceived levels of deforestation. The majority of respondents perceives a seriousness deforestation (52.2%) compare to respondents who state that its average (43.5%). Since the problem of deforestation is high there is a need therefore to sensitize the community to plant more trees in order to reverse the degradation process.

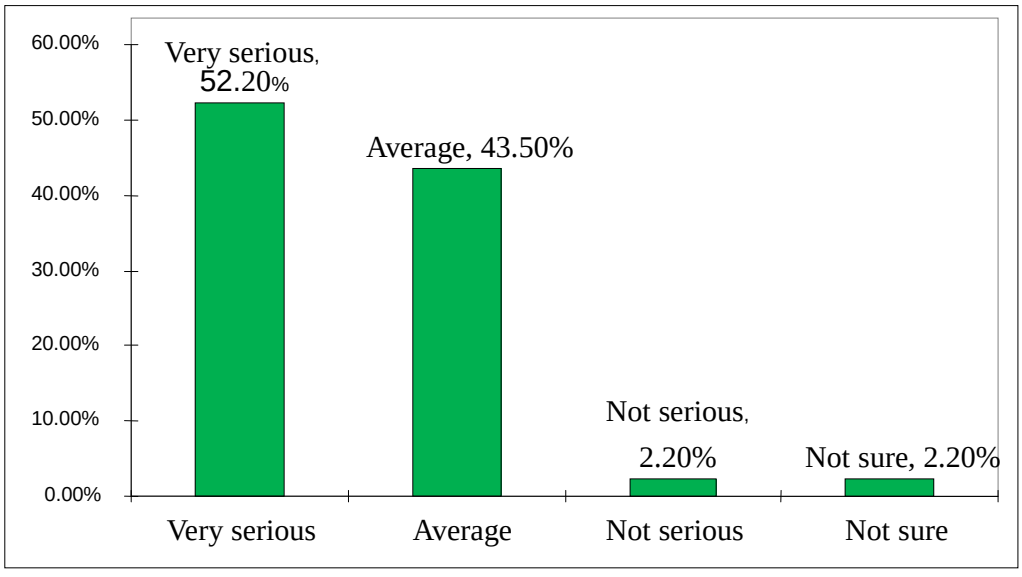

Figure 2: Perceive extent of deforestation in the study area

Source: Survey data 2010

1.4.12 Consequences of deforestation

Most of the respondents mentioned the consequences of deforestation to be water shortages (41.3%), loss of soil fertility (21.7%), irratic rainfall (21.7%) and soil erosion 13% (Table, 10). This implies that there is a need therefore of planting trees in order to minimize the effect of deforestation.

Table 10: Perceived consequences of deforestation

Consequences	Frequency	Percent
Soil erosion and gullies formation	6	13.0
Shortage of water	19	41.3
Loss of soil fertility	10	21.7
Lack of clean air	1	2.2
Insufficient rainfall	10	21.7
Total	**46**	**100.0**

Source: Survey data (2010)

1.4.13 Strengths and gaps identified in the project area

Through Focus group discussion method of data collection, strengths and gaps related to tree planting were identified (Table, 11). Community strengths in existing services of afforestation identified were availability and commitment of community on tree planting, existence of conservation by laws and Village Environmental committee. Gaps in the existing services of afforestation are insufficient knowledge about tree planting and management within a community, Low community awareness and motivation on tree planting.

Table 11: Strengths and Gaps identified related to tree planting

Community strengths in the existing services of afforestation	Gaps in the existing services of afforestation
• Availability and Commitment of the community on tree planting activities. • Environmental conservation is one of important pillar in implementation of Kilimo Kwanza. • Land ownership such as customary, official land law is practiced. • Existence of Village Environmental Committee. • Existence of environmental conservation by laws.	▪ Insufficient knowledge about tree planting and management within the community. ▪ Low community awareness and motivation on tree planting. ▪ Inadequate supply of tree seeds and seedlings to the community. ▪ Shortage of land for agriculture and tree planting. ▪ Limited access to the credit to support tree planting activities. ▪ Low income per households was a barrier to implement different tree planting activities ▪ Weak incentives support from the Government in tree planting. ▪ Cost of seedlings is very high this can be a constraint to the poor.

Source: Researcher compiled data, (2010)

1.4.14 Environmental stress and community assets

Though FGD method of data collection environmental stress and community assets in relation to afforestation were identified (Table, 12). The main environmental

stresses identified were deforestation, destraction of catchment area and soil erosion. This was due to cutting of trees for timber, farm expansion and fuel wood. Apart from that, lack of adequate skill in environmental and low income played the great role. Different strategies were discussed in order to overcome the environmental stress in the study area which includes community awareness, capacity building and tree planting.

Table 12: Environmental stress and community assets in relation to afforestation

Environmental stress	**Source of stress**	**Ways of reducing stress**	**Community assets in relation to afforestation**
Deforestation	-Cutting trees for timber, farm expansion and fuel wood. -Lack of adequate skills in environment. -Low income -Shortage of land for agriculture activities	• Community awareness on environmental conservation. • Training • Reinforcing by laws • Tree planting • Use of improved stoves.	• Environmental by law. • Extension staffs • NGOs and CBO dealing with Environnements conservation. • Village leaders • Village natural ressource commette (VNRC). • Tree nurseries • Fertile land • Available of water source and springs. • Natural forest and mount Kilimanjaro • Committed manpower.
Destruction of catchments area	Shortage of land for agriculture activities. Poor farming techniques. low rainfall.	• Planting trees • Demarcating catchments area. • Awareness raising • Reinforcing by laws	
Depletion of natural resources	-Tree cutting -wild fire -high population	Community awareness on environmental conservation. Training community. Reinforcing by laws. Planting more trees.	
Soil erosion and gullies	Deforestation. -Poor farming techniques.	Planting trees. Training proper farming techniques	

Source: Focus Group Discussion (2010)

1.4.15 The study identified the following needs

Based on findings from different methods of data collections during CNA, the following needs were identified.

(i) Most of the farms lack tree shades which is very important for growth of coffee. This was due to the low returns from coffee, thus most of farmers shifted from the agro-forestry based home garden system to monocultural annual cash/subsistence crops (e.g. maize, beans, and tomatoes) which need less shade.

(ii) There is increasing of soil erosion and low vegetation cover. There is a need of restoring soil fertility through ecological soil conservation measures especially through introduction of agro-forestry.

(iii) Most of stakeholders expressed their concern about silting of drainage system causing flooding during the rainy season.

(iv) Community expressed the need to have fruit trees in order to improve nutrition as well as to increase household income.

(v) There is a need to plant trees along the road and river banks as well as catchments areas in order to increase vegetation cover. This is due to the shortage of land which facing the community of Kilimanjaro region.

(vi) The study identifies the problem which caused by deforestation, these includes; soil erosion, shortage of water, loss of soil fertility and erratic rainfall. There is a need of tackle this problem through tree planting and other conservation measures.

(vii) There is a need to increase tree nurseries in order to have enough seedlings to cater for the community demands.

1.5 Community Needs Prioritization

According to CEDPA, (1994) Pair wise ranking is often used by social scientists and increasingly by community development workers as a means of prioritizing or ranking lists prepared by communities. In this study pair wise ranking was used to rank the problem according to priority of community. Pair wise ranking compares the different problems and shows which of the problems are of greatest importance. Results shows that, the problem which score a higher mark (Table, 13) is the first priorities of community and the one which score lowest mark is the least priority of community related to environment.

Table 13: Pair wise ranking matrix from problem ranking

Problem	Loss of soil	Deforestation	Shortage of water	Erosion &	Low vegetation cover	Draught	Score	Rank
Loss of soil fertility.		Deforestation	Loss of soil fertility	Loss of soil fertility	Low vegetation cover	Loss of soil fertility	3	3
Deforestation			deforestation	deforestation	deforestation	Deforestation	5	1
Shortage of water				Shortage of water	Low vegetation	Shortage of water	2	4
Erosion and gullies					Low vegetation cover	Erosion & gullies	1	5
Low vegetation cover						Low vegetation cove	4	2
Draught							0	6

Source: Focus Group Discussion, (2010)

Results in Table, 13 shows that problem of deforestation was given high priority by community followed by low vegetation cover, loss of soil fertility, water shortage, soil erosion and the last was drought. From the pair wise ranking it was established that deforestation was the most pressing environmental problem.

1.6 Chapter Conclusion

According to the findings through different methods applied, it was noted that the community at West Kibosho ward were experiencing deforestation, low vegetation cover, loss of soil fertility, water shortage and soil erosion. As it was established from the survey, focus group discussion, records review and observation it was clear that the root causes of the problem was deforestation. Appropriate intervention through introduction of rural afforestation especially in water catchment areas, farm land and along the road as well as increase production of tree seedling through encourage private tree nurseries as well as group tree nurseries was proposed.

CHAPTER TWO

2.0 PROBLEM IDENTIFICATION

2.1 Overview

This chapter defines specific areas which need action by the community and the change organization (LEPAJE). It clearly define the problem and states the circumstances, in which the community is confronted, identifies target community of the proposed interventions, identifies other stakeholders who may have stake in the proposed project and identifies the project goals and objectives. Finally, it analyses the host organization (LEPAJE) in terms of vision, mission, structure, goals and objectives and how these relate to the needs of the proposed project.

2.2 Background to Research Problem

In Kilimanjaro region population growth has led to scarcity of agricultural land, fuel wood and forest products. Attempts to meet these needs have accelerated deforestation and dependence on non-sustainable land use practices (Regional Commissioner Office, 1998). Driven by the low returns from coffee, many farmers shifted from the agro forestry based home garden system to annual cash/subsistence crops (e.g. maize, beans, and tomatoes) which need less shade. This necessitated clearing of coffee and other shade trees, without replacing the tree that maintains soil fertility. Thus soil was left bare for longer periods of time which consequently increased run-off, soil erosion and siltation. The affected communities have noticed the large scale effects of such destruction include, flooding, rapid siltation in irrigation systems and water reservoirs, with consequent reduction in agricultural productivity and scarcity of fuel wood and trees products for other uses. Massive

deforestation and the fuel wood crisis are the main factors that have drawn National, NGOs and decision makers' attention to forest and rural afforestation.

2.3 Problem Statement

Despite the growing awareness on environmental degradation especially deforestation in Kilimanjaro and particularly in Moshi rural district where the interventions were initiated, smallholder farmers have not been able to come up with workable mechanisms to arrest the situation due to limited livelihood support activities and environmental conservation knowledge. Previous environmental conservation programs like Kilimanjaro Integrated Land-use Management Program (KILUMP) have had some impacts on land conservation. However, their achievements were hardly sustained since they were a supply oriented. The programs also applied a more coercive approach with some by-laws enforced by the higher authorities.

In the recent past some other organizations, which focus on environmental concerns have emerged with a more participative approach. These include Kilimanjaro Environmental Conservation Management Trust Fund, Mount Kilimanjaro Environmental Conservation, Kilimanjaro Environmental Network Organization Trust and Kilimanjaro Rotary Club, whose activities have not yet been of significant impact due to limited range of their activities. The community members attributed this problem to an increasing land degradation caused by indiscriminate tree cutting coupled with poor farming methods due to inadequate knowledge and skills on environmental conservation.

The community needs assessment exercise led to a better understanding of the circumstances in which the community members were confronted, and thus to define the nature of the problem faced: poor farming methods, dependence on fuel wood as a major source of energy, deforestation, poor yield and low income. Therefore a rural afforestation project was designed for smallholder farmers and institutions as an intervention for reducing land degradation and improve livelihood in Moshi rural District.

2.4 Project Description

2.4.1 Project title

Afforestation for mitigation against land degradation on Kilimanjaro highlands, Kibosho West Ward, Moshi rural District.

2.4.2 Project physical location

The project operational area is where the intervention was planned in Kibosho West Ward, Moshi rural District, Kilimanjaro Region. Kibosho west ward is located in west of Moshi town, that is 17 km from Moshi town (Appendix, 2). The ward is composed of five villages where the intervention was done in all five villages.

2.4.3 Target community

The project aimed at directly and indirectly benefiting more than 12,000 people in the community of five villages from Kibosho West ward including; Kifuni juu, Umbwe onana, Nkomongo, Kombo and Umbwe Sinde village. The target community participated in establishment of tree nurseries, tree planting and

management of the planted trees. It was envisaged that the participation of the community in the project would build the sense of project ownership and thus sustainability.

2.4.4 Stakeholders' analysis

Apart from smallholder farmers who are the major stakeholder, others are development NGOs & CBO, Governmental Departments, Local government and Religious organization stakeholders. Table 14 summarizes the roles, expectations and possible contribution of each stakeholder to this project.

2.4.5 Project goal

The overall goal of the project was to create a sustainable enabling environment that provides the basis for economic development and sustainable livelihoods while restoring the ecological integrity of the Kilimanjaro highland ecosystems.

2.4.6 Project impacts

The project impacts were reduced deforestations, increases of water flow, alleviate abject poverty and hence improve quality of life.

2.4.7 Project objective

The project aim was reducing land degradation through tree planting and creating general awareness and develops skills on environmental conservation. The specific objectives were:

(i) To implement awareness creation programs and involvement of communities on tree planting activities at Kibosho west Ward by July, 2011.

Table 14: Stakeholders of the afforestation project

Name of stakeholder	Functions/roles	Area of operation	Expectation from the project	Possible contribution
LEPAJE (CBO)	-Awareness creation. - Tree seedlings production. -Tree planting	Kibosho west Ward	Implementation, monitoring and evaluation of project activities	-Capacity building. -Tree seedlings production, - Tree planting. -Financial support
World vision Tanzania (WVT) (NGO)	-Environmental conservation and improve livelihood of the communities.	Kilimanjaro region	Small farmers trained on income generating activities, i.e. beekeeping, fish farming and tree nurseries establishment	Capacity building and material support.
Kilimanjaro National Park (KINAPA) (Government agency)	-Conservation and protection of wildlife.	Kilimanjaro region	Improve of vegetation cover and ecosystem	-Community mobilization skills. -Financial support.

Name of stakeholder	**Functions/roles**	**Area of operation**	**Expectation from the project**	**Possible contribution**
Moshi Rural District Council	-Support development activities. -Maintain law	Moshi rural district	-Sustainable environmental conservation. -Viable development	Encourage and support farmers. -Protect project assets.
Wanama Root and Shoots (CBO)	-Raise Community awareness. -Raising tree seedlings	Kibosho East Ward Moshi rural district.	-To be partners	Capacity building skills -Tree seedlings production
TATEDO (NGO)	Training improved stoves to the communities	Moshi rural district	Small farmers trained on improved stoves	Capacity building skill and experience on tree planting and improved stoves.
Traditional irrigation improvement program (TiP) (NGO)	Improve traditional water source/ springs.	Moshi rural district, Rombo and Mwanga	Conservation of catchments area and water source through planting trees and enact by law	-Capacity building. -Tree seedlings production,

(ii) To training 100 tree nursery group members on tree nursery operations and tree planting by July, 2011.

(iii) To establish 10 tree group nurseries and 15 individuals nurseries with total of 100,000 seedlings and plant them around farm holds and along the river bank by December, 2011.

2.4.8 Host community based organization (CBO)

The organization which host the project is Lea Panda Jenga (LEPAJE) which is a local CBO in Moshi rural District. After holding discussions with LEPAJE executive committee regarding collaborating in the areas related to environmental development facilitation, they accepted and suggest serving Kibosho west Ward where environmental problems were on increase. Most of communities members in the project area need skills and knowledge on environmental conservation.

2.4.8.1 Overview of LEPAJE

LEPAJE serves one Ward in Moshi Rural District with five villages; it was established in 2003 by a group of 30 people who were concern about the severe environmental degradation in Kilimanjaro region. The CBO educate and involve communities residing on the slope of Mount Kilimanjaro on the value of trees and environmental conservation for sustainable development. LEPAJE is a registered Community Based organization (CBO) No. H/W 0606/2006 based in Kifuni juu Village, Kibosho West ward in Moshi rural district.

2.4.8.2 LEPAJE Community based organization goal

The main goal of LEPAJE is to contribute to the improvement of environmental conservation through tree planting and management on sustainable way in Moshi

Rural District. Since environmental development process is gradual and time involving, the CBO needs much more time to enable the communities to achieve their own destiny. The CBO is rooted within the five villages hence knowledge and best practices can be transferred or replicated elsewhere.

2.4.8.3 LEPAJE vision, mission and activities

The following are the Vision and Mission statements of LEPAJE CBO.

(i) Vision

The vision of LEPAJE is to envision a healthy environmental for people residing on the slopes of Mount Kilimanjaro through the stewardship, long-term care and nurturing of forests.

(ii) Mission

The Mission of LEPAJE is to promote environmental conservation in grass root communities through capacity building, tree planting for sustainable management of the environment.

(iii) Activities

The main activities in LEPAJE include:

- To enhance proper land use planning to reduce the rate of land degradation
- Constructions of fuel efficient cooking stoves.
- Awareness creation and educate people on the importance of environment conservations and their needs to participate in tree planting.
- Tree seedlings production and sell at reasonable price.

- Encourage communities to improve water sources and catchments areas
- Encourage and training farmers on good farming practices.

2.4.8.4 Source of funds

The funding sources include donors and local support from the community members. Currently, the future plan for funding is to empower the community so as to enable them support their own project for sustainable development. Despite the fact that CBO is receiving fund from UNDP the organization still needs more support. The ultimate goal of the CBO is to have self-supporting activities. The challenging task is on encouraging the community members to believe that they can run their own self-initiative projects without depending on donors.

2.4.9 LEPAJE SWOT analysis

SWOT analysis (strengths, weakness, opportunities and threats) was used to analyze the internal strengths and weakness of CBO and the external opportunities and threats that it faces. Table 15, shows summary of the SWOT analysis information.

Table 15: Summary of LEPAJE SWOT analysis

Strengths	Weakness	Opportunities	Threats/ challenges
Leadership skill	Lack of transparency	Availability of training institutions	Dependency on donor support
Cohesion	Lack of trust to management	Forest product market development	Lack of clarity on ownership of CBO
Networking	Low reputation	Information	Split of CBO
Trained	Lack of motivation	Partnership	sustainability

personnel			

Source: Compiled by the researcher 2010

2.4.10 The MCED student roles in the project

MCED Student was coordinating the project and its responsibilities include but not the least; reporting to Executive chairman of LEPAJE for:

(i) Making sure the project activities are implemented as according to the plan and budget.

(ii) Preparing monthly, quarterly, semi-annual and annual progressive and financial reports.

(iii) Controlling the efficiency and effective use of the finances.

(iv) Coordinating and facilitating project committee members and meetings

(v) Organize and network so as to solicit other sources of fund in order to intervene other un-reached areas of the community need.

(vi) Supervising tree nurseries activities through collaborating with field officer and group leaders.

(vii) Preparing and presenting progress report of the project in the evaluation meetings which involves all stakeholders.

(viii) Organize capacity building training sessions to group's and institution on tree nursery establishment and tree planting.

(ix) Collaborate with group leaders and LEPAJE management to conduct monitoring and evaluation of the project.

CHAPTER THREE

3.0 LITERATURE REVIEW

3.1 Overview

This chapter presents a survey of literature related to environmental conservation efforts and their likely impacts on livelihoods of people throughout the world. It gives the theoretical literature review, empirical literature as well as policy review.

3.2 Theoretical Literature

3.2.1 A Concept of rural afforestation

Rural afforestation was initially defined as, “any situation which intimately involves local people in a forestry activity. It embraces a spectrum of situations ranging from woodlots in areas which are short of wood and other forest products for local needs, through the growing of trees at the farm level to provide cash crops and the processing of forest products at the household, artisan or small industry level to generate income, to the activities of forest dwelling communities” (FAO, 1978).

Thus, rural afforestation was perceived as encompassing activities by individual households, women and men farmers and other people, as well as those involving a community as a whole. The growing focus on rural development did much to draw attention to the dependence of rural people on forests and trees. Rural afforestation comprises three main elements, these were, the provision of “fuel and other goods essential to meeting basic needs at the rural household and community level”, the provision of “food and the environmental stability necessary for continued food production” and the generation of “income and employment in the rural community”

(FAO, 1994). In rural afforestation the primary focus is on people, on community involvement and on tree that offer direct and indirect benefits (Jessica, 2009). The concept of village forests to meet the needs of the rural people is not new. It has existed through the centuries all over the country but it was now given a new character (Edwin, 1990).

3.2.2 Need of rural afforestation to the community

The need for a rural afforestation scheme was felt as the rural population growth that still depends largely on fuel wood and other biomass for their cooking and heating (Agarwal, 2002). This demand for fuel wood will not come down but the area under forest will reduce further due to the growing population and increasing human activities. Rural forestry is very important in developing countries, such as food security, energy shortage environmental conservation, and unemployment (FAO, 1994). However, it is a critical element in the resolution of food scarcity because it can help to halt declining agricultural productivity associated with poor land use, deforestation, erosion and decline water supplies. Rural afforestation is also critical in resolving energy crises in rural areas, which most cases caused by declining fuel wood availability. Finally, rural forestry can give rise to significant opportunities for employment and income, both in forestry activities and in related processing activities.

3.2.3 Rural Afforestation and Millennium Development Goals

The United Nations Millennium Development Goals (MDG) has eight major challenges (http://www.mdgmonitor.org/browse_goal.cfm). Their aim is to eliminate

hunger and poverty, decrease child mortality, improve maternal health, improve the human health trough mitigation of HIV, malaria and other diseases, raise the status of women, educate more people, create a global partnership for development and at the same time conserve the global environment (http://www.mdgmonitor.org/browse_goal.cfm). If accomplished, these goals will improve the economy; give peace improve the environment and security and well-being to all, holistic solutions are necessary to succeed with such an achievement as the current problems are complex and interact with one another (Angela, 2009).

Rural afforestation may contribute to most MDGs and to other goals. Seven global challenges related to the MDGs may partly be targeted through practice rural afforestation. According to Louse, Buck and James (1998), rural afforestation decreases the hunger by increase food productivity through soil fertility and land regeneration with rural forestry methods. Momberg (1993) noted that, local marketing of forest products that bring income from rural afforestation has reduced poverty within the community. Improvements of economic security through multipurpose land use system meaning that if one crop fails, another income or food source may be utilized to support the household (Louse, Buck, James and Erick, 1998). Rural afforestation especially agro forestry provides more diverse and nutrient rich food and fruits beneficial to health and nutrition for child growth and human (Howard and Ramachandran, 1987).

Rural afforestation technologies help to conserve biodiversity if properly conducted. Ecosystem services are another benefit, pollination as an example. Other ecosystems may indirectly be protected, if pressure on the natural environment declines due to

rural afforestation (Durant, 2008). Watershed services, soil erosion decreases if trees are planted on treeless land, tree leaf fertilizes the soil, roots retain soil and the soil texture improves so that water can infiltrate instead of becoming overland flow contributing to sheet erosion (Jessica, 2009).

Climate change, rural afforestation systems are more resilient to climate change and enable the rural poor to adapt better to climate change and work as carbon sink (Kandji, 2006). Human and institutional capacity, it is necessary to build a human and institutional capacity in research and development for rural forestry, for example in some places in developing countries, primary and secondary school classes learn about the rural forestry approach to become “farmers of the future (Garrity, 2006).

3.2.4 Environmental problems in Kilimanjaro Region

Seven major categories of environmental problems in the Kilimanjaro Region have been identified. These problems include; land degradation, inadequate water supply, pollution, habitat fragmentation and loss of biodiversity, deterioration of aquatic systems, deforestation and frequent forest fires (Regional commissioner office, 1998). The problems impact negatively on the economy and well being of the people of Kilimanjaro and the nation at large. The process of land degradation varies and may not be easily detected or measured. Top-soil is washed away from upland areas due to bad cultivation habits - such as cultivating on slopes of a gradient of more than 50% without terraces (Allan, 2006). In other areas, silting of dams and reservoirs and the bareness of the top soil in many fields are a manifestation of land degradation. The productivity of soil has been considerably reduced in many parts of

the highland and middle ecological zones of the Kilimanjaro Region (Durrant, 2008). In lowland areas, overgrazing contributes to land degradation.

3.2.5 Land degradation and its causes

Land degradation results from the removal of woody vegetation, especially when the removal rate is higher than the rate of regeneration. The closed dense forests cover is only 14.3 percent of the Kilimanjaro Region (Regional commissioner office, 1998). Human impacts on deforestation, soil erosion, overgrazing, and degradation of water resources and loss of biodiversity have all resulted into land degradation (Negal, 1994). Poor agricultural practices such as shifting cultivation, lack of crop rotation practices, lack of agricultural technology and land husbandry techniques exacerbate the problem (Jessica, 2009*).* The effects of deforestation and overgrazing, which are localized, gave rise to serious degradation in places such as Shinyanga, Dodoma, Singida and part of Arusha area in Tanzania where livestock units have exceeded the carrying capacity and massive tree cutting to eradicate tsetse fly (Edwin, 1990). This situation is seen as a good indicator of the capacity for the decentralized institutions at the local level to enforce laws and instruments which are meant to ensure sound environmental management *(*Eugene and Vincents, 2001).

3.2.6 Effects of land degradation

Land degradation reduces the ability of land to support life, affecting wild species, domestic animals, agricultural crops and people. The reduction in plant cover that accompanies land degradation leads to accelerated soil erosion by wind and water. South Africa is losing approximately 300-400 million tones of topsoil every year due to soil erosion (Koohafkan, 1996). As vegetation cover and soil layer are reduced,

rain drop impact and run-off increases (Momberg, 1993). Water is lost off the land instead of soaking into the soil to provide moisture for plants. Even long-lived plants that would normally survive droughts die. A reduction in plant cover also results in a reduction in the quantity of humus and plant nutrients in the soil, and plant production drops further (Louse, Buck, James and Erick, 1998). As protective plant cover disappears, floods become more frequent and more severe thus triggering the soil erosion and formation of gullies (Koohafkan, 1996).

3.2.7 Poverty and land degradation

Poverty is both a cause of land degradation and a consequence (Agarwal, 2002). People who lack adequate resources often have little alternative but to their environment. Land degradation makes their poverty worse because the land produces less. If people cannot feed themselves, they cannot purchase what they need. Most land degradation occurs because there are no other options, not because of recklessness or deliberate exploitation of the environment. Furthermore, the report indicates that, the poor have been blamed unfairly for land degradation (Muthoka, 1998).

3.2.8 Strategies for arresting land degradation

One of the greatest impediments to the socio economic development of societies in Sub-Sahara Africa, indeed to the very survival of a good many of them as nation-states, is the loss of fertile top soil through erosion and the disappearance of vegetative cover through deforestation ultimately resulting in land degradation (Koohafkan, 1996). More than anything else, poverty and environmental degradation

feed on each other in a relentless vicious circle. Poor people live in and suffer from degraded environments and in a reciprocal way, they create environmental degradation because poverty forces them to do so. This reciprocal linkage between poverty and environmental degradation provides the clearest demonstration of the way social political and economic issues affect questions of environment and development. Beyond that, it is widely assumed that land degradation, together with the greenhouse effect and global warming; establish negative linkages between man and his environment on a global scale. As such, the problem of land degradation as a pressing and multidimensional policy agenda cuts across various policy fields, when these policy fields are crystallized and formulated in the relevant societal setting. As an integral component of global environmental problems, land degradation is being addressed at the grassroots, national and international level (Nagel, 1994).

3.3 Empirical Literature Review

3.3.1 Himo Environmental Management Project

Himo environmental management project is NGO started as CBO in 1991 and registered as NGO 1998, which is financed by UNDP through Community Development Trust Fund (CDTF).This NGO is operated in four districts Kilimanjaro region include, Rombo, Moshi rural, Hai and municipal but the main concentration area was Rombo and Moshi Rural. The goal of Himo Environmental Management programme was to protect and manage natural resources focus on water, land and vegetation rehabilitation so as it can make a significant contribution towards improved livelihood of small scale farmers in Kilimanjaro region. During the implementation focusing among other thing was based in four programmes namely:

(i) Small farm improvement programme, this was involved soil and water conservation and rehabilitation of traditional irrigational water supply.

(ii) Tree nursery establishment and afforestation through institutional and private ownership.

(iii) Improved stoves and energy saving.

(iv) Training and demonstrations programmes.

3.3.1.1 Experience and challenges of Himo environmental project

Since the communities knowing that the project was financed by donor, whatever you ask them to do they demand money and as per donor any project to be successful beneficiaries must contribute either money or human efforts. So this project was not seen as owned by the communities and therefore given little priorities by the community (Evaluation report, 2009). Most of young men who are energetic they don't want to work in the farm only old and women this make the construction of physical soil conservation measures to be difficult as only women and old were available. Financial constraints lead failing to carry out their activities effectively as was planned.

3.3.1.2 Sustainability of Himo environmental project

To make sustainability of the project, village technician selected from each village were well trained on issues related to environmental conservation include tree nursery establishment and tree planting, construction of improved stoves and construction of conservation measures i.e. fanya juu. There is no element of

conserve the environment by the community without make elements of income generating activities such as beekeeping, fish farming and planting of high marketable fruits i.e. orange, mango and avocado.

3.3.1.3 Lessons learnt from Himo Environmental Project

The lessons learnt from Himo Environmental project will provide useful experience for LEPAJE CBO for implementation of project intervention. This include,

(i) The need for intensive sensitization and awareness creation to the communities so that community will own the project,

(ii) The need of improving income of communities through environmental activities i.e. Beekeeping and fish farming.

(iii) Importance of human resource capacity building for project implementer,

(iv) Incorporating project interventions into the district plans for fund searching.

(v) The need of involving key stakeholders in the project implementation from the up to the end of the project.

(vi) Lastly the importance of communities' commitments and participation fully in the project planning, implementation, monitoring and evaluation in order ensure sustainability of the project.

3.3.2 Hifadhi Ardhi Shinyanga (HASHI)

The Hifadhi Ardhi Shinyanga (HASHI) provides another experience on how to manage environmental projects sustainably. The Hifadhi Ardhi Shinyanga (HASHI) project was a government initiative under the Ministry of Natural Resources and Tourism. It has been instrumental in reviving the Sukuma people's traditional

practice of conservation. The objectives of HASHI were to ensure that people in Shinyanga Region are self-sufficient in wood requirements, to encourage communal wood growing schemes in the region, to encourage the establishment of shelter belts or windbreakers, shade, avenue and fruit tree growing, and to conserve soil and to reclaim depleted land through establishment of ngitiri.

To prevent further land degradation and to reclaim eroded land, HASHI had to adopt several approaches including establishment and management of ngitiri, tree planting and proper farming practices. In most cases, these measures have been applied in combination although each is serving a separate purpose. The establishment of vegetation cover had been applied to promote sediment deposition, increase infiltration, and reduce surface runoff and to provide a more stable soil surface for plant growth. Since 1986 HASHI (Shinyanga Soil Conservation programme) has emphasized the *in-situ* conservation of wood and grasslands. Between 1980 and 2001 a total area of 78, 122 ha was restored in 172 villages that HASHI has focused on (Barrow, Edmond and Sterward, 2005).

3.3.3 Soil conservation and Agroforestry programme in Arusha

In northern Tanzania, Soil Conservation and Agroforestry programme in Arusha (SCAPA), villagers were given a say in drawing up the plans as these would have been impossible to be implemented unless the majority of the local people felt motivated and involved (Kerhof, 1990). Local Authorities were also responsible for mobilizing people in protecting their environments by establishing specific by- laws and preparing land-use plans.

3.4 Policy Review

3.4.1 National Environmental Policy, 1997

The National Environmental Policy provides a framework for making fundamental changes that are needed to bring environmental considerations in to the main stream of decision-making in Tanzania. The overall objectives of the national environmental policy are the following:

(i) To prevent and control degradation of land, water, vegetation and air which constitute our life support systems.

(ii) To improve the condition and productivity of degraded areas including rural and urban settlements in order that all Tanzanians may live in safe, healthy, productive and aesthetically pleasing surroundings.

(iii) To ensure sustainability, security and equitable use of resources for meeting the basic needs of the present and future generations without degrading the environment.

(iv) To raise public awareness and understanding of the essential linkages between environment and development and to promote individual and community participation in environmental action (URT, 1997:9).

3.4.2 The National Environment Management Act

A key policy instrument was the first to recommend an integrated national policy framework and legislation for sustainable maintenance, protection and exploitation of the environment and natural resources. The National Environment Management Council (NEMC) was created along this Act and in response to the national need for such an institution to oversee environmental management issues and also implement

the resolutions of the Stockholm conference (1972), which called upon all nations to establish and strengthen national environmental Councils to advise governments and the international community on environmental issues (URT, 1983).

3.4.3 The National Conservation Strategy

The National Conservation Strategy for Sustainable Development emphasizes sustainable use of natural resources, citing land degradation as the main issues to be addressed, and underscoring participatory approach in the whole matter of conservation. Introduction of national forest program was among efforts by government to address the challenging responsibilities in the near future and to increase the forest sector contribution to the national economy and poverty reduction. The program aimed at addressing the degradation of forest land through other land uses and man made disasters, illegal harvesting, encroachment including how to conserve the capacity of forests as water catchment areas for water supply and production of hydropower and unique biodiversity areas in different eco-zones.(URT, 2008). Poor people rely heavily on natural resources (land forests and water) and are most vulnerable to external shocks and environmental risks, including drought and floods. It is important to check over-exploitation of natural resources and environment degrading (URT, 2005).

3.4.4 The Rural Development Strategy of 2002

Is a lead policy guideline for rural development projects/programmes that seeks to reduce poverty in rural areas. The Strategy spells out key actions to address the land degradation problems in rural areas such as making environment impact assessments

for rural development projects mandatory. The strategy also points out the importance of promoting rural afforestation and Agroforestry for small scale and medium wood based industries, fuel wood saving techniques and alternative energy sources to deter encroachment of forests. It acknowledges that pro-poor growth is heavily dependent upon rural people being able to secure the natural resources that sustain their livelihoods (URT, 2002).

3.4.5 National Land Policy (NLP)

National land policy promotes and ensures access to land, encourages the optimal use of land resources and facilitates broad-based social and economic development without upsetting or endangering the ecological balance of the environment. NLP promotes an equitable distribution of and access to land by all citizens. The NLP further ensures that existing rights to land, especially customary rights of small holders (i.e. peasants and herdsmen who include beekeepers and women), are recognized, clarified and secured in law (URT, 1997).

3.4.6 The Village Land Act, 1999

Provides opportunities for villages to develop land use plans, which take into account all activities including agriculture, forestry and the environment. It provides opportunities for surveys and demarcation of village boundaries and development of land use plans and allows women to own land. The land policy and the Village Land Act will contribute greatly to secure ownership of land for various uses, encourage sustained investment and development, reduce conflicts and encourage increased agricultural production in the districts and the region as a whole. These legislative

provisions for Sustainable land management are the responsibility of the National Land Use Planning Commission (NLUPC) which has the role of coordinating all land use and management related activities in Tanzania (URT, 1999).

3.4.7 The National Forestry Policy (1998) and the Forestry Act (2002)

The aim of National forest policy is to enhance the contribution of the forest sector to the sustainable development of Tanzania and the conservation and management of her natural resources (URT, 1998). The Policy calls for the involvement of local level institutions such as district councils, wards, villages and individuals where new forms of partnership with the Central Government are being promoted for improved conservation and income generation (URT, 1998). Income generating activities such as beekeeping are being introduced to help improve the incomes of communities in line with the Tanzania overall development goals. A programme of Participatory Forest Management has been introduced and operationalized through the Joint Forest Management (JFM) and Community Based Forest Management (URT, 2002).

CHAPTER FOUR

4.0 PROJECT IMPLIMENTATION

This chapter provides both the original plans and the actual implementation process and activities carried out to accomplish project goal and objectives. In order to ensure effective implementation of the afforestation project, necessary interventions has to be carried out through planned activities.

4.1 Project Product and Outputs

The project was geared to develop skills for both community and LEPAJE members on tree nursery establishment, tree planting and management. Project aimed to facilitate the adoption of tree planting among the groups and institutions. The following were the envisaged project benefits to the community:

(i) Tree nurseries establishment to supply tree seedlings in the area, small farmer groups and individuals also encouraged to establish their own nurseries.

(ii) Water supply for domestic and irrigation to be increased, thus reducing water conflict between water users.

(iii) Coffee production to be increased due to shade provision.

(iv) Reduction of soil erosion hence soil fertility increased

(v) Availability of fuel wood nearby.

(vi) Availability of wood products

4.2 Project Planning

The project was planned in conjunction with LEPAJE, the hosting CBO (Appendix 6). The project collaborated with District council, and other stakeholders including:

KINAPA, WVT, Wanama Roots and Shoots, TiP, Rotary club Kilimanjaro and community members. For tangible results and effectiveness within the minimum time available, the project focused on three issues include; awareness creation, capacity building through training and seedlings production and tree planting.

4.3 Gantt Chart for Project Implementation

The Gantt chart for implementation plans (Appendix 7) present a list of activities which needed to accomplish the set objectives include people responsible, timeframe and resource required. The actual implementation has demanded more time and involvement than expected.

4.4 Inputs and Costs

This section provides what goes into the project, specifically generate a list of what inputs were needed to accomplish the objectives and the cost of each input. In this respect, each objective was provided with its respective inputs and cost for each input as shown in Appendix 8.

4.5 Staffing Pattern

The project activities were incorporated within the LEPAJE CBO which has limited number of staff as compared to their goal and objectives. The CBO had the chairperson, secretary, accountant and forest field officer who is partially attached to the CBO. The field officer is a retired forest officer who is competent with forest issues. Two volunteers based at Kifuni juu and Nkomongo village were highly in cooperated within the project. In addition to organization responsibilities, the project

coordinator was also part and parcel of the project in conducting capacity building trainings sessions to group members and ward leaders. Tree nursery Group leaders collaborated effectively with LEPAJE and the existing NGOs within the area. The two volunteers participated during the groups training and the development of the monitoring sheet.

The nature of the decision making lies on the structure of the organization (Appendix 9). Each staff in his/her position was responsible for all programs activities in collaboration with the committee concern. The field officer was responsible for overseeing all the activities of the project including: capacity building to community members, leading tree planting activities, networking with various stakeholders including environmental committees and to supervising daily activities of the project.

4.6 Project Budget

This section will provide the cost estimates of the entire project for 18 months period. The project budget was contributed by the project advisor, community member, LEPAJE CBO and other stakeholders. The planned budget for the entire project (Table, 16) was estimated to be 3,899,700/= So far the actual budget raised and spent was 3,200,000/=. Some of the planned activities were not accomplished due to different factors including: inadequate funds, fund availability, commitment of group members and poor support from the village leaders.

4.7 Actual Implementation of the Project

This section provides the actual implementation report. This process outline activities carried out to accomplish each objective, this section provides details of accomplished objectives and activities.

Table 16: Budget summary for project implementations

SN	Budget line items	Total Amounts T.Shs.
1	Communication and other accessories	100,000
2	Workshops and mobilization meetings	300,000
3	Training	600,000
4	Stationeries, typing and photocopy	200,000
5	Travel and transport	500,000
6	Meals and drinks (project committee)	250,000
7	Nursery materials	1,550,000
8	Field officer allowance	480,000
	Total	**3,899,700**

Source: Researcher compiled data, (2011)

The rural afforestation project has been planned to be carried out for duration of 18 months starting from July, 2010. Therefore the implementation status report shown (Appendix 10) was for only one year of implementation. The objective of increased awareness and involvement of Kibosho west community on afforestation and effects of deforestation was accomplished through implementing four activities. These activities include, one inception workshop which was conducted at Ward level and Village assembly meetings were conducted in each of five villages. Others including, formation of six voluntary environmental groups and 350 brochures and 400 leaflets produced and distributed to communities. The resources used in the implementation of these activities were, funds, human resources, stationeries, hall, transport, meals and soft drinks. The implementation of these activities was done in October, 2010.

The objective of capacity building on tree nursery establishment and tree planting and management was accomplished by conducting training to group members and village leaders. A total of 124 group members and leaders were trained on tree

planting techniques and one training material developed in collaboration with other stakeholders. Inputs used in the implementation of these activities were, funds, human resources, stationeries, time, note books, pen, training material, hall, meals and soft drinks (Appendix 7). Turn-up of the participants was higher than planned, it was planned only 100 participants to attend the training but because of awareness and important of this training led to a number of institutions and other individuals to attend at own cost.

The objective of tree seedling production and tree planting was not completed, it was partially done. Tree planting activity was not completed due to delaying in seedling production and some of the seedlings did not germinate due to technical problem. Some of the activities done to accomplish the objective including obtained materials for tree nurseries establishment where by a total of 44 tree nurseries were established with 120,000 tree seedlings.

Figure 3: Photographs highlighting tree nursery established by individual at Umbwe-onana Village

Tree nursery established by individuals were managed well (Figure, 3) and seedlings produced were sold to community and nearby town. Tree species raised include: Grevellia robusta, Albizia schimperiana, Cedrela ordorata, Croton macrostarchy and Mangifera indica. The price of seedling was between 100 to 300 shillings. Tree seedlings produced by groups (Figure, 4) were distributed to communities and institutions free (Figure, 5). Most of seedlings produced were planted in the farm, river banks, along the road and into degraded area of half mile strip up to the end of May, 2011.

Figure 4: Photographs highlighting tree nursery established by group at Kifuni juu Village

Half mile strip is an area adjacent to Kilimanjaro catchment forest owned by District council and managed by adjacent communities. The essence of half mile strip was to reduce pressure on the dependence of the catchment forest for wood requirements by community for betterment of Kilimanjaro catchment forest. Due to high demand of forest product by community, the area was deforested and most of the places were

bare. Village leader and communities decided to plant tree in most of bare land in half mile strip (Figure, 6). The exercise of tree planting still continues in various parts within the project operational areas.

Figure 5: Photo showing distribution of tree seedlings to the communities from group nursery at Kifuni juu village

The resources used in the implementation of these activities were, funds, human resources, seeds, polythine tubes, soil ingredients, water, land, seedlings and transport. Some of unmet needs to accomplish this objective were availability of varieties of seeds and funds. The delay of raising some of the seedlings was due to high price of seeds than expected and its availability, slowly contribution of funds from stakeholders and poor pre-treatment of seeds before sowing which led to poor germination of seedlings was also contributing factor. These limiting factor were established during monitoring of the implemented activities.

Figure 6: Photo showing communities involved in tree planting at Half miles strip.

CHAPTER FIVE

5.0 MONITORING, EVALUATION AND SUSTANABILITY OF PROJECT

5.1 Overview

This chapter presents the monitoring and evaluation framework for the project. As a yardstick of measuring whether implementation of the activities was done in accordance to the objectives, the process of monitoring and evaluation commences as the project starts. The importance of monitoring and evaluation as key concepts in any project development is underscored. It outlines key activities to be monitored and corresponding monitoring methods; monitoring questions and important monitoring indicators and tools. Evaluation is also discussed in terms of information needed, source of information and methods to be employed. The project sustainability is discussed in terms of financial, institutional and political sustainability.

5.2 Participatory Monitoring

A participatory monitoring approach was adopted for this project. Participatory Monitoring is the systematic recording and periodic analysis of information that has been chosen and recorded by insiders with the help of outsiders (CEDPA, 1994). The main purpose of participatory monitoring was to provide information during the life of the project, so that adjustments and/or modifications can be made if necessary. Data collected during participatory monitoring process were used as early warning signs that alert management on bottlenecks and available opportunities that require a special attention and action for the purpose of improving ways of success in project implementation.

Participatory monitoring was conducted regularly to access the project progress in line to planned activities and keep the project on schedule. Monitoring provided the coordinator with information needed to analyze current situation and looking for the direction in which a project was going and make other necessary decision on the resources, in term of finance, human and other requirements. The mechanism for conducting participatory monitoring included formation of project committee which involved all stakeholders of the project for supervision of daily activities of the project in collaboration with LEPAJE – CBO.

5.2.1 Monitoring Information Systems

The monitoring of project activities at the first level was conducted by the project staffs that were responsible for controlling project daily activities in collaboration with project committee. Monitoring was planned and conducted in monthly basis through different methods such as reviewing of past reports and records, focus group discussion, interviews, project visit and observation. The monitoring was carried out for the planned activities, staff performance, resources, funds and input utilization. Monitoring of these activities was conducted by project committee in collaboration with LEPAJE CBO. During interviews community members and various stakeholders were interviewed by researcher for the purpose of getting their views and recommendations about the implementation of project and the problem facing the implementation of project activities.

To ensure the reliability and validity of data during the monitoring exercises triangulation of data was used whereby various methods were used which include,

Focus Group Discussion, personal interview, participatory observation and review of past reports and records. These methods consistently produced similar results.

5.2.2 Participatory Research Methodology for Monitoring

Participatory Rural Appraisal (PRA) was the research approaches used in collection of information for monitoring of project. The method enabled and empowered community members of all age, gender and positions in a community to undertake project activities more effectively and efficiently. Tree nursery group members and individuals who established tree nurseries participated in the PRA during monitoring of project activities. PRA encouraged participation in planning, monitoring and evaluation through participatory observation, purposive interviews and Focus Group Discussion.

5.2.3 Monitoring Objectives

The objectives of monitoring exercise were:

(i) Ensuring that all activities were carried out properly by the right people and in time.

(ii) Determining whether the inputs in the project were utilized properly.

(iii) Determining whether the way the project carried out was inline with the plans.

(iv) Analyzing the situation whether there was any challenge in the project implementation and finding solutions.

5.2.4 Monitoring questions

The following questions were used to guide the monitoring process during the implementation of planed activities on monthly bases.

(i) Were the planned activities done on right time and place?

(ii) Were the resources budgeted utilized effectively as planned?

(iii) Was each staff in his position and on duty?

5.2.5 Participatory monitoring plan

Participatory monitoring plan (Appendix, 11) presents logical sequence for the systematic project monitoring. The table summarizes the list of activities planned to be monitored derived from the plan, duration for each activity to be completed, indicators, responsible parties, resource and the methods planned to be used in monitoring the activities.

5.2.6 Actual monitoring results

Through monitoring, the project coordinator learned that, there was a need to create stability among the member groups before the initiation of the establishment of tree nurseries. Time limit was also a very significant fact for this unaccomplished activity. The report review showed that two training were conducted successfully. The trainees attendance was very high than expected this was due to some leaders and institutions members who attended training without official invitations, at their own cost (Table, 17). The trainers were competent and the training evaluation shows that the subjects were understood. However, with regard to the impact of this training the evaluation will have to be conducted later. Based on monthly report one inception workshop was conducted and more than 95% of 50 people invited attended, various stakeholders, village and ward leaders attended this workshop. Five mobilization meetings were succefuly conducted one in each village, and a total of 820 participants attended (Table, 18).

Table 17: Number of participants attended training

Village	Participants			
	Expected	Attended		
		Male	Female	Total
Kifuni juu	24	12	17	29
Umbwe- onana	16	13	8	21
Nkomongo	22	15	11	26
Kombo	20	17	8	25
Umbwe - sinde	18	16	7	23
Total	100	73	51	124

Source: Researcher compiled data, (2011)

Table 18: Number of participants attended mobilization meeting

Village	Participants attended		
	Male	Female	Total
Kifuni juu	133	78	211
Umbwe onana	81	47	128
Nkomongo	65	99	164
Kombo	110	90	200
Umbwe sinde	65	52	117
Total	**454**	**366**	**820**

Source: Researcher compiled data, (2011)

Ten temporary voluntary environmental groups with a total of 249 members were formed (Table, 19).

Table 19: Number of tree nursery groups and members

Village	No of groups	Number of members		
		Male	Female	Total
Nkomongo	1	12	8	20
Kombo	2	23	27	50
Umbwe -sinde	2	20	24	44
Umbwe onana	2	35	25	60
Kifuni juu	3	50	25	75
Total	**10**	**140**	**109**	**249**

Source: Researcher compiled data, (2011)

However, it was learnt that most community members wanted to join the tree nurseries groups, but were in doubt on availability of nursery materials where they were afraid to contribute from their pockets. Also the management of tree nursery was another issue since it was communal work that was difficult to manage. The only assurance they had was that once the group formed it was managed by members and set their own regulations.

A few qualitative study conducted by a researcher using FGDs, interviews, field visit and observation methods revealed that there has been a notable abrupt increases in a number of tree nurseries from one nursery to forty four tree nurseries (Table, 20). A number of people selling tree seedlings of different varieties include fruit, ornamental and timber species had also increased. Some interviewees argued that the increase was due to awareness creation done on nursery establishment and the support they got from the project and village leaders.

Most of the activities were implemented as was planned except for the tree nursery establishment whereby, some of seeds required by communities were not obtained at right time. This made farmers delayed to raise seedlings, other seeds failed to germinate due to poor seed pre-treatment. Seedlings that were not ready to be planted during rain season March to May, 2011 was planned to be planted during the rain session of October- December, 2011.

Involvement and participation of communities at all stages of the project were observed to be very high. Interviewers said that, the reason behind was because they were involved from the beginning of the project in this way they managed to own the

project as their property. Some of the seedlings produced by groups and institution were distributed free to the communities and those produced by private individuals were sold at reasonable price of 100/= per seedling. During the field visit and interview the owner of the nurseries said that, they decided to sell some of the seedlings produced in order to cover the production cost incurred. Findings during field visit and monthly reports revealed that a total of 65,000 tree seedlings were planted along the road, catchment area and on farm land. However the impact of these trees planted, will be evaluated later on.

Table 20: Status of tree seedlings production in the project operational area

Ward	Village	No of groups nurseries	No of institutions	No of private nurseries	Total seedlings
Kibosho west	Kifuni juu	3	2	11	48345
	Umbwe Onana	2	1	3	14255
	Nkomongo	1	2	4	17664
	Kombo	2	1	5	21073
	Umbwe sinde	2	2	3	18663
Total	**5**	**10**	**8**	**26**	**120,000**

Source: Researcher compiled data, (2011)

5.3 Participatory Evaluation

A participatory evaluation is an opportunity for both outsiders and insiders to stop and reflect on the past in order to make decisions about the future (CEDPA, 1994). The aim was to determine the relevance and fulfillment of objectives as well as efficiency, effectiveness, impact of overall goal and sustainability of the project. Furthermore evaluation was used to inform what to be done in the future as the result of experience and the work which has been done (Jody and Ray, 2004).

5.3.1 Planned Evaluation

The evaluation was conducted to assess the impact of the project and the extent to which the project objectives were achieved. This was intended to help in either redesigning the project or designing another new project in line with the available facts. Evaluation was conducted to determine the relevance and fulfillment of objectives as well as efficiency and effectiveness. The evaluation was also focused on whether the objectives were achieved within a specified time frame and resources.

The impact of the overall goal will be determined later after conducting a study because tree takes time to grow and brings impact to soil and vegetation cover. In general term, the data to be collected during the evaluation of project impact exercise will include; changes in crop productivity, rise of smallholder farmers' income, change of tree planting practices and change of people behavior and attitude towards deforestation.

5.3.2 Performance Indicators

Indicators are quantitative or qualitative criteria for success that enable one to measure or assess achievement of project objectives. According to Mcmillian (1986), there are nine common types of indicators which include availability, relevance, accessibility, utilization, coverage, quality, effort, efficient and impact. The performance indicators are measures of inputs processes, outputs, outcomes and impact of development projects. During the evaluation of this project the indicators were used to assess the performance (Table, 21).

Table 21: Performance indicators of the afforestation project

Objective	Input indicator	Output indicator	Impact indicator
1.0: Increase awareness and involvement of community on importance of afforestation.	• Number of stakeholder workshop conducted. • Number of general meetings conducted. • Participants (Gender). • Availability of posters and brochures material. • Involvement of other stakeholder, village leaders and ward leaders	• Number of people attended workshop. • Number of people aware on deforestation effect and mitigation strategies. • Number of women and youth attended meeting and workshop. • Number of other stakeholders, village leaders, political leaders and ward leaders participated. • Number of tree nurseries groups formed.	• People change attitude and behavior towards deforestation. • Effect of tree cutting decreased.
2.0: Training group members on tree nursery establishment, tree planting and management	• Number of training conducted. • Type of training conducted. • Participants (Gender). • Availability of training material	• Number of people trained. • Number of people with skills to raised tree seedlings. • Number of people involved in tree nursery establishment	• Number of group member visited field officer • Change of people attitude and knowledge. • Quality seedlings.

Objective	Input indicator	Output indicator	Impact indicator
3.0: To establish 10 tree group nurseries and 15 individual nurseries with total of 100,000 seedlings by December, 2011	• Kind of equipments, tools and materials obtained for tree nurseries establishment. • Advice and nursery site visited.	• Number of material, equipment and tools purchased • Number of tree nurseries established. • Number of tree seedlings produced. • Area planted trees. • Number of tree seedlings planted.	• Recovery in highly degraded land. • Water flow increases. • Crops productivity increased. • Soil erosion decreases. • Vegetation covers and shed for coffee farm increased. • Health of people improved. • Income of people increased.

5.3.3 Dimensions of Project Evaluation

It was planned that two evaluations be conducted one after one year of implementation and another one at the end of the project implementation. The evaluation was to focus on whether the entire project objectives were achieved as planned, these objectives include; the environmental awareness outcome, environmental training, tree nursery establishment and the impact of tree planting. A summary of project evaluation sheet is present in Appendix 12.

5.3.4 Evaluation Questions

The following questions were used to solicit relevant evaluation information:

(i) How many trees were planted?

(ii) The rate of deforestation is increased or reduced?

(iv) Did all farmers participate in tree planting activities?

(v) How many seedlings were produced?

(vi) Did all objectives achieved and resource used effectively?

5.3.5 Composition of Evaluation Team

The composition of evaluation team included the community members representative, key stakeholders, project coordinator, project committee and representatives from institutions. The results of the evaluation team were presented to the evaluation workshop to allow discussion and timely decision.

5.3.6 Evaluation research design

In order to effectively apply the participatory evaluation, exploratory research design proved to be the best (Jody and Ray, 2004). The research questions for the evaluation

were to know if there was progress towards the target and challenges that affect the project. At the end of the project what will be investigated will be actually to know the extent to which the project objectives have been achieved and if not why.

5.3.7 Research instrument

Observation, interviews, focus group discussion and documentary reviews were used to collect data.

5.3.7.1 Documentary review

This was focused on monthly report, project proposal, training report, monitoring report, quarterly report and annual reports of the project implementation. These provided a picture of the situation of resources, challenges and implementation lags, and the corrective measures taken.

5.3.7.2 Interviews

Ten stakeholders include farmers were interviewed using an interview guide (Appendix 13) with questions which were used to solicit relevant evaluation information. This method was useful in soliciting information from the people affected by the project in one way or the other. It was especially useful in getting opinions of farmers, government leaders, extension staff and stakeholders (Krishnaswami, 2002).

5.3.7.3 Participatory observation

The evaluation team carried out observation in the field of actual things done by the project or through the project, trees nurseries, educational materials, seedlings produced and tree planting practices.

5.4 Focused Areas Evaluated and its Achievement

5.4.1 Impact

The project started in 2010, so for environmental project it was too early to really measure the impact of the project on economical and environmental aspects. We tried to get an appreciation of the target group and the different other stakeholders on the different aspects of objectives achieved in relation to inputs (Table 22).

5.4.2 SWOT analysis on the evaluation of the project

SWOT analysis was used to analyze the internal strengths and weakness of the project and threats that it faces. A rapid SWOT analysis on the evaluation of the project showed the following:

Strength

(i) High relevance of the project activities.

(ii) The project operates through LEPAJE and Moshi rural District Council structures.

(iii) Strong involvement of institutions

(iv) Strong involvement of community

Weakness

(i) Weak of ownership of the project by the community

(ii) Lack of structured and systematic follow - up of project activities

(iii) Lack of coherence in tree nursery establishment and Seedlings production.

Opportunities

(i) A good number of nice experiences and initiatives

(ii) Commitment by the District and LEPAJE CBO to put emphasis on environment protection.

(iii) Willingness of grassroots to participate in project activities

Threats

(i) Lack of an integrated approach of the project

(ii) Lack of clarity on ownership of the project.

(iii) Sustainability of the project

5.5 Project Sustainability

According to Australian Agency for International Development (2000), sustainability is the continuation of benefits after major assistance from the donor has been completed. The project was rooted in the community. It is the community members initiative through participatory process which led to the existence of the project. The most needed things for the project sustainability was clarity and ownership of goal to the groups members. So far the group leaders as well as their members were on the top in implementation of the programme to attain the goal. The trained leaders were competent and creative; both group leaders and the LEPAJE staff were capable in community supervision for growth and expansion of tree growing activities. Currently the coordinator will continue to collaborate with group leaders for more encouragement on transparency and accountability in the implementation of project activities. The groups have a potential to network and collaborate with other groups and associations for experience and best practice sharing.

Table 22: Project evaluation summary

Project objectives	**Performance indicator**	**Expected outcome**	**Actual outcome**
1.0 Increase awareness and involvement of communities on tree planting.	-5 Assembly meetings, -One workshop to be conducted. -600 brochures and leaflets produced and distributed.	-leaders, community and stakeholders become aware of the project. -Community awareness on afforestation increased	-Project accepted by communities. -Community owns the project. - 10 Voluntary tree nurseries groups formed.
2.0 To training 100 tree nursery group members on tree nursery operations and tree planting by July, 2011.	-Two training on tree nursery operations and planting techniques to be conducted.	-community participation, skills and knowledge on tree nurseries operation and aforestation to be increased	-Two training for community members was conducted and a total of 124 participants attended.
3.0. To increase establishment of more tree nurseries and tree planting.	-25 tree nurseries to be established with 100,000 tree seedlings and will be planted on the farm and catchment areas.	-Vegetation cover and shade on coffee farm to be increased. -Water flow to be increased.	-44 tree nurseries were established with a total of 120,000 seedlings. -75,000 trees planted in the coffee farm and catchment areas.

The participation of the community from the beginning of the project enhanced the sustainability of the project but there were circumstances that affecting the community and the viability of the project in future, these include; donor dependence, low involvement and participation of community in development activities, Political matters, low involvement and participation of stakeholders and support of the project from community and village leaders.

The project has planned a phase out workshop before the end of the project so that project committee may discuss on the sustainability of the project and ways to ensure capacity to function without depending on external funding. There are three aspects of sustainability which we will look at in these communities. These aspects are financial, political and institutional sustainability.

5.5.1 Economic and Financial Sustainability

The CBO has managed to build a spirit of self - reliance among tree planting groups. So far the beneficiaries have been able to continue planting tree without external support after being sensitized and given relevant skills. For instance, through group initiatives and contributions, the group members managed to establish tree nurseries by contributing their efforts and material such as collecting forest top soil, manure, sand, provide buckets, hoes and provision of site for tree nurseries establishment free of charge. Also communities used the locally available materials such as bamboo, banana leaves, plastic material and pots for raising the seedlings. The act of contributing materials themselves towards their project was the evidence of element of ownership and sustainability of the project. Training on nursery operations provided enabled them to collect tree seeds locally within their area.

On the financial aspect, as mentioned in the implementation part, tree seedlings are being sold to the individuals and institutions and nearby town, and it's on high demand. The money which will be obtained will assist in the continuation of the project.

5.5.2 Political Sustainability

The current forestry and environmental protection policies are in great support of the idea. The country top leaders have urged the government and political leaders to support afforestation activities at all level. There was a good environment exist between local government and the community members at Kibosho west Ward; whereas the District Council may exploit the existing political opportunity to enhance project and support community members to improve vegetation cover and reducing land degradation. In Tanzania there is a stable political status for many years, the project should take this as an opportunity to seek and acquire fund from different stakeholders. The most advantage the project has is a good foundation of authentic community participation from the early stages of the project. The Project is well known by the local leaders and even the councilors in the area. Every three months there is a quarterly report which is shared by both community members and local leaders of the area. Community leaders such as Village chairperson, village executive officer and ward executive officer were well involved from the project inceptions and throughout implementations process.

5.5.3 Institutional Sustainability

The LEPAJE -CBO leaders have been in front line to ensure what was initiated is coming into reality. As mentioned earlier, the LEPAJE is still operation within that

community hence they will work hand in hand with groups for goal accomplishment. Presence of the project committee of which members are the representatives from the community and from the stakeholders is a step forward to good and transparent leadership. Project field officer is a retired forest officer who volunteered to work with LEPAJE - CBO and he was part and parcel in all training conducted to groups members and institutions. The trained groups leaders and members as per evaluation are aware and capable to lead the community to attain their goals. LEPAJE group will become a centre of learning for community and institutions.

5.5.4 Sustainability Indicators

The following was the outline of sustainability indicators

(i) Communities established tree nursery group.

(ii) Various stakeholders set budget fund for conserving environment.

(iii) District council to mainstreaming this project activities into district plan so that they can get some assistance from the district.

(iv) Community members had their skills improved about importance of conserving the environment.

CHAPTER SIX

6.0 CONCLUSION AND RECCOMENDATION

6.1 Overview

This chapter presents the conclusion and recommendations of the study and project undertaken in the community. This conclusion and recommendation entail on very brief summary of the whole project from CNA, Problem identification, Project implementation, monitoring and evaluation and Sustainability of the project.

6.2 Conclusion

The project on rural afforestation for reducing against land degradation and improving livelihood of the communities on the Highlands of Kilimanjaro has made a great outcome to both the communities and the author. The involvements of community members made them proud to have increased their awareness, skills, supply of tree seedlings and increase vegetation cover through tree planting intervention.

According to the community needs assessment conducted at Kibosho west community, it shows that there is increased soil erosion, soil infertility, water shortage for irrigation, deforestation and loss of vegetation cover. The area was highly degraded due to massive tree cuttings and poor farming techniques, these made most of farmer’s experience low yield. Based on the study it was realized that, afforestation to be successful at the household level requires continuous capacity building and awareness creation for the initiated of tree nurseries establishment and tree planting. In order to address the problem of land degradation afforestation

project was highly given priorities with specific objectives that include, awareness creation to the community, capacity building in relation to tree planting and establishment of tree nursery and tree planting.

With a short time of project implementation about a year, it will be too ambitious to expect that all objectives will be met and the impact realized. Awareness creation has been met in a great part. Under this objective all activities were implemented as planned. This included training of tree nurseries groups, preparing and distributing of brochures and relevant leaflets, sensitization of community members through meetings, formation of tree nurseries groups and to conducting strategic stakeholders' workshop to carryout advocacy role on afforestation in their respective areas. During implementation of the project activities at the early stage, local leaders, who were oriented and sensitized in order to support afforestation campaign and fully integrate afforestation interventions in their local plans and support tree growers, have not played their roles accordingly. This could be as a result of being engaged in other crucial national issues such as general election campaign for MP and councilors.

Training was conducted in order to increase skills and knowledge of community and village leaders on tree nursery operation and tree planting management. Tree nurseries have been established more than had been expected and tree planting was done by communities and institutions. Trees planted are mostly in farm land, around households and in river banks. Despite of all achievement in this project, there was a technical problem experienced whereby farmers failed to treat some of seeds before

sowing in order to overcome seed dormancy, this caused some poor seeds germination and delaying planting period. Those seedlings which were not planted during rainy season, March to May will be planted during the short rain season November, 2011. Also some of the seeds which were required by communities were not available on time hence they decided to use any available which preferred by community. Other factor that impeded the implementation of project activities were; funds limitation specifically for procurement of the needed tools for tree nurseries operation, fewer funds was availed than expected. It was initially thought that transport needed for distribution of seedlings could be a constraint to project implementation but this was never the case because tree seedlings being in a big demand, were collected by the communities by themselves.

Monitoring and evaluation conducted to the afforestation project shows that, the community accepted the project and own it. The impact of the overall project goal will be determine later through conduct study because tree takes time to grow and brings impact to soil and vegetation cover. Project sustainability requires not only means but also advocacy for environmental issues within the community and other stakeholders such as NGOs, civil societies and the government in large. The most needed things for the project sustainability is clarity and ownership of goal to the group's members.

In summary it can be concluded that the CBO vision will be realized as the project is in conformity to needs of the community involved and the National policies. In fact the National leaders are very supportive to environmental conservation including tree planting and conservation. It is worth repeating that if the local authorities

become personally and officially committed to the afforestation endeavor, there is a high chance of success as the community has started to show signs of positive attitudes towards this issue.

6.3 Recommendations

The project committee could not evaluate the impact of the project on the reversing of land degradation and increases of productivity and hence high income of the people because the period for the project assignment was too short for tree planted to show impact on the soil improvement. Since the project intended to change community behaviors and attitude towards environmental degradation especially deforestation, therefore it is more likely that there needed a long time to see the impacts of the project. A research is needed to ascertain the impact of environmental conservation program on capacity building, soil improvement, increase of productivity and incomes of the farmers.

In order to improve land degradation in Moshi rural district in terms of tree planting it is recommended that, Moshi rural district council should establish a comprehensive and sustainable afforestation programme and allocate adequate resources for its implementation. This can be more usefully by involving other stakeholders rather than every stakeholder trying on his own. Tree planting groups including CBOs should be assisted through solving existing constraints facing them, such as lack of tree nurseries materials, tree seeds and technical known aspect. The district council should take up the idea of tree planting groups by facilitating formation of a body or associations related to tree planting interventions and give them necessary support.

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APPENDICES

Appendix 1: Questionnaire form

(A) General information

Questionnaire number……..……..……

1. Name of Interviewer…….....

2. Name of respondent…….....Age.....Sex…..……..

3. Village……..……ward……..…….Division…….District….……

4. Village population…….

A6. Education level

Primary school (01)

Secondary school (02)

Adult education (03)

College (04)

University (05)

Never went to school (06)……..…… ( )

A7. How long have you been in this village? (Years)

1-10 (01)

11-20 (02)

21-30 (03)

31-40 (04)

Above 41 (05)……. ( )

(B) Knowledge and skills on environmental degradation

B1. What is the general situation of environment in your village?

Still good (01)

Bad (02)

Moderate (03)……..…..…..... ( )

B2. Have you heard of environment degradation?

Yes (01) No (02) Not sure (03)……. ( )

B3. What are the main environmental problems in your village?

Losses of vegetation cover (01)

Disturbances of biodiversity (02)

Loss of soil fertility (03)

Destruction of water sources (04)

One to four above (05)

Others (explain) (06)…….……..…….…… ( )

B4. What are the main causes of environmental degradation in this village?

Deforestation (01)

Over stocking (02)

Poor agriculture practices (03)

High rate of population (04)

Poverty (05)

Others explain……..…….…. ( )

B5. If deforestation is mentioned as one of the causes of environmental degradation, what do you think are the causes?

Lack of the knowledge among the community on the importance of afforestation (01)

Expansion of agricultural farms (02)

To increase income (03)

Fuel wood (04)

Materials for construction purpose (05)

Others (specify)…… ( )

B6. What are the consequences of deforestation in this village?

Soil erosion and gullies formation (01)

Shortage of water (02)

Loss of soil fertility (03)

Lack of clean air and shade (04)

Lack of rainfall (05)

Others (specify) ……. ( )

B7. What do you think is a level of seriousness of deforestation in this area/ village?

It is a serious problem (01)

Its moderate issue ((02)

Not serious problem (03)

Not sure (04)…….….. ( )

(C) Community participation in Afforestation

C1. Have you planted trees in your farm?

Yes (01)

No (02) …….…… ( )

C 2.If yes for what purpose?

Fruit (01)

Tree shade for coffee (02)

Erosion protection (03)

Fuel wood (04)

Timber (05)

Income (06)

Poles for construction (07)

Others (specify) ……....……...…… ( )

C4. What are the factors which lower tree planting activities?

No seedlings (01)

No space for planting (02)

Insufficient technical knowhow (03)

I don't see the importance of planting trees (04)

Others (specify……..… ( )

C5. Where did you get seedlings?

From my tree nursery (01)

Bought (02)

Free from government (03)

Uprooting from mother trees (04)

Others (specify)…….....…… ( )

C6 Have you attended any training related to tree planting and nursery establishment? Yes (01) No (02)……..... ( )

C7. Have you received any assistance from any stakeholder related to tree planting?

Yes (01) No (02)…….……...… ( )

C8. How is the level of community participation in tree planting?

Low (01)

Moderate (02)

High (03)……...……. ( )

C9. What is the size of your farm?

1>acre (01)

1-2 acre (02)

3-5acre (03)

More than 5 acres (04)…….……... ( )

C10. Will you expand more area for tree planting activities?

Yes (01), No (02)……..…….( )

(D) Recommendations and opinions

D1. Are you in favor of afforestation efforts to be done in this village?

Yes (01)

No (02) …… ( )

D2. If yes what do you recommend to be done to foster afforestation?.....

.....

.....

D3 What type of tree species you will prefer to plant in your farm and water source?.....

.....

.....

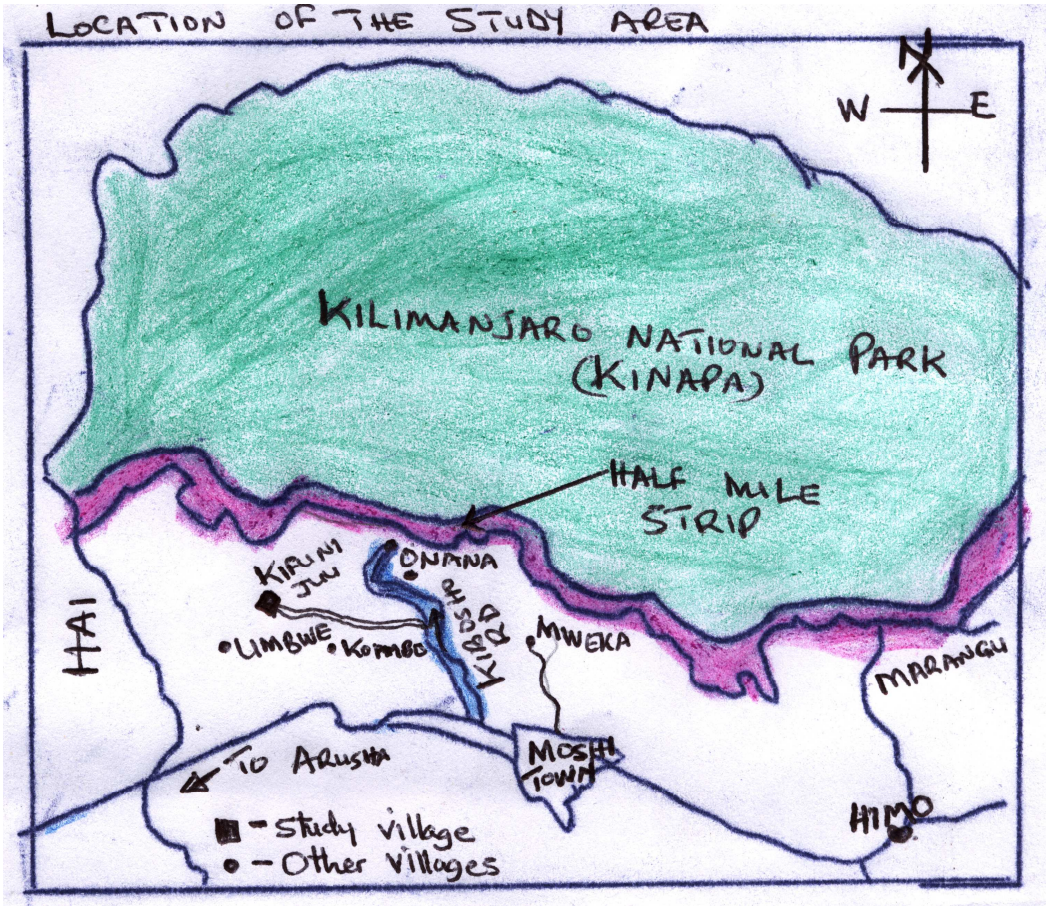
D4. If you will be provided materials for tree nurseries establishment, are you ready to start your own tree nurseries.

Yes (01)

No (02)…….. ( )

THANK YOU

Appendix 2: Sketch Map of the study area



Source: Researcher survey, 2010

Appendix 3: Focus group discussion guide

1 Date……..…….……

2 Village/ward…….……

3 Number of participants…….……me…….……..ke……..…..…….……..

4 Group Interviewed ……..…….

5 What is environmental degradation :

6 What are the main causes of environmental degradation in this area?

7 If deforestation is one of the causes of the environmental degradation: What do you feel is the extent of the problem? what are the causes? and what are the consequences?

8 Do you think the stakeholders have done enough to address the problem?

9 What initiatives you know that have been taken by respective Government and NGOs, leaders in addressing the problem of deforestation? Are they adequate?

10 What do you think is the attitude and practice of communities in tree planting?

11 Have you planted trees or taken any measure to protect vegetation?

12 Would you like to establish individual and group tree nurseries?

13 Please recommend what steps to be taken to address the problem of deforestation

14 What obstacles can face tree planting practice?

THANK YOU ALL

Appendix 4: Individual interview checklist

1. Interviewee name and title……..……..
2. Date of interview and place
3. Briefly explain the environmental situation in Kibosho west Ward and Moshi rural district with based on vegetation cover.
4. Why do you think deforestation is a major problem in this area? what are the causes and the magnitude of the problem? What do you think is the impact of this situation?
5. Do you think the measure taken by the government and NGOs to address the problems its adequately enough? What other measures should be taken?
6. What obstacles can face tree planting practice?
7. What happen if nothing will be done regard to the deforestation problem?
8. What recommendation do you give to improve the situation in this are

Appendix 5: Community attitudes and solutions regarding to barrier to access in afforestation

Barrier to Access	**Solution for Accessibility**
- Insufficient knowledge about tree planting and management within the community. -Low community awareness and motivation on tree planting.	-Provision of Training on tree planting and management to the community. -Public education and awareness campaign on tree planting environmental conservation.
-Inadequate supply of tree seeds and seedlings to the community.	-Establishment of groups and individual tree nurseries.
- Shortage of land for agriculture and tree planting.	-To practice agro forestry and to plants more trees along the roads, boundary planting and to the river banks
-Limited access to the credit to support tree planting activities.	-Encourage community to form groups and introduce VICOBA and SACCOS in the area.
- Poverty – low income in most of households is a barrier to implement different tree planting activities	-Introduction of income generating activities such as beekeeping, fish farming and to improve coffee production through planting new seedlings.
-Weak incentives support from the Government and other stakeholders in tree planting	-Government and other stakeholders to be involved in tree planting through provision of incentives and materials.

Appendix 6: Project implementation plan

	Activities	Product & output	Resources	Responsible parts	Source of verification	Risk and assumptions
1. To implement awareness creation programs and involvement of communities on tree planting activities by July 2011.	- To conduct one workshop for introduction of project at Ward level.	The leaders become aware of the project and agree the project to be undertaken.	Meals and drinks, Stationeries, venue, Transport.	Project coordinator, LEPAJE CBO KINAPA, WEO	Workshop report	Willingness of leaders to participate in project activities.
	-To conduct village general meetings in five villages one each.	The communities become aware of the project and agree the project to be undertaken	Transport. Stationeries,	Project coordinator, VEOs ZEO	Meeting minutes/ report	Willingness of farmers to participate effectively in project activities
	- To mobilize community to form Groups in each village	Democratic Groups formed (youth, women, men)	Transport. Stationeries,	Project coordinator, Communities, Village leaders	Report and Meeting minutes	Community common interest, culture and value
2.0 To training 100 tree nursery group members on tree nursery operations and tree planting by July 2011.	- Preparing training materials in collaboration with DFO and other stakeholders.	Produced trainin materials	Transport, stationeries,Venue, Meals and drinks	Project coordinator, DFO KINAPA,	Reports	
	-To conduct	100	Transport,	Project coordinator,	-Training	Community

	training on tree growing technical know-how to 100 participants from five villages.	participants trained on tree growing technical knowhow.	stationeries,Venue Meals and drinks, demonstration site, tree nursery establishment materials	DFO. Field officer	report. -Monthly report	participations
3.0. To establish 10 tree group nurseries and 15 individual nurseries with total of 100000 seedlings by December 2011	-Purchase materials for tree seedlings production. (seeds, polythine tubes, watering canes, spades, rakes)	Obtained materials for tree seedlings production	Funds	Project coordinator, District council, KINAPA, LEPAJE	Receipts, Report, Observation.	Inflation
	-100,000 Tree seedlings produced by groups and institutions	25 tree nurseries established with 10,000 tree seedlings produced	Labour, nursery equipments and tools, site, water, soil ingredient	Project coordinator, District council, KINAPA, LEPAJE, Communities, institutions	Reports, Direct observation,	Tree seedlings pest and diseases.
	-100,000 tree seedlings distributed for planting in the field.	Deforested land be reduced, Increased number of planted trees	Land, Lobour, technical, Tree seedlings, Working tools	Project coordinator, District council, KINAPA, LEPAJE, Communities institutions	Reports, Direct observation,	Unpredictable climatic conditions.

Appendix 7: Gantt chart for project implementation plan

Activities	**Project month in 2010/2011 from July**																	**Resources required**	**Responsible person**
	8	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**		
Conduct CNA																		-Transport Stationeries	Project coordinator
To conduct workshop for introduction of project at Ward level.																		Meals and drinks, Stationeries, venue, Transport.	Project coordinator LEPAJE KINAPA,
To conduct village general meetings in five villages one in each village.																		Transport. Stationeries,	Project coordinator VEOs ZEO
To mobilize community to form voluntary Groups in each village																		Transport.	Project coordinator Village leaders
Production and distribution of brochures and leaflets.																		Stationeries	Project coordinator ZEO
Preparing training materials by collaborating with DFO and other stakeholders.																		Transport, stationeries, Venue, Meals	Project coordinator District council,

To conduct training on tree growing technical know-how to 100 participants from five villages.																		Transport, stationeries, Venue, Meals	Project coordinator ZEO District council
Purchase materials for tree seedlings production. (seeds, polythine tubes, watering canes, spades, rakes)																		Funds	Project coordinator District council, KINAPA, LEPAJE
150,000 Tree seedlings produced by groups and institutions																		Labour, nursery equipments and tools, site, water, soil ingredients	Project coordinator District council, KINAPA, LEPAJE, Communities, Institutions
150,000 tree seedlings distributed for planting in the field and management of planted trees																		Land, Lobour, technical, Tree seedlings, Working tools	Project coordinator District council, KINAPA, LEPAJE, Communities, institutions
Monitoring																			Project committee

Appendix 8: Inputs and cost of inputs

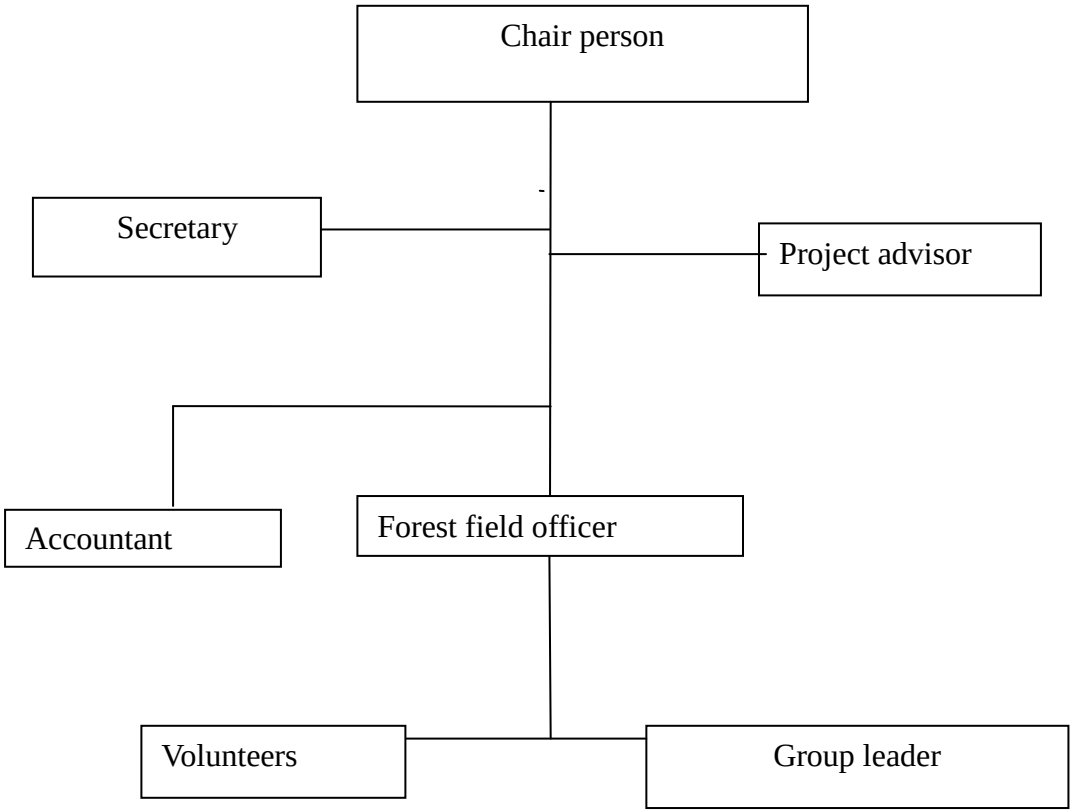
Objective	**Activities**	**Input required**	**Cost for each input**
Increase awareness and involvement of community on afforestation activities by the end of 2011	One day workshop for introduction of project at Ward level.	-Facilitators -Venue -Time - Transport -Meals -Stationeries -fund	-Allowance 2 staff x 15000 x 1 =30,000/=. -Venue 20,000.x 1= 20000/= -Transport fuel 20lts x 1700=34000/= -Lunch 40 parts x 3000/ x1day = 120,000/= Stationeries -40 parts x 600/- =24000/= **Total = 228,000/=**
	Assembly meetings in five villages one in each village.	-Facilitators -Time - Transport -Venue -Stationeries -fund	-Allowance 1 staff x 15000 x 5days= 150,000/ -Transport petrol 25lts x 1800= 45,000/= Stationeries 1 rim paper = 6,000/= **Total = 201,000/=**
	Community to form voluntary Groups in each village.	-Personnel -Time - Transport -Stationeries	-Transport petrol 4lts x 1800= 7200/= -Notebook 5 notebooks x 500/- = 2500/= **Total = 9700/=**

	Production and distribution of brochures and leaflets	-Stationeries	Stationeries 1 rim photocopy paper = 6000/= Mass production of materials 50 x 1200 = 60,000/= **Total = 66,000/=**
Increase awareness and involvement of community on afforestation activities by july, 2011	Preparation of training materials.	-Facilitators -Venue -Time - Transport -Stationeries -fund	-Allowance 6 staff x 15000 x 3 =270,000/=. -Venue 10,000.x 3 days= 30,000/= -Transport fuel 30lts x 1700=51,000/= -Stationeries 2 rims of paper x 6000/@ =12000/= -Printing 30 pages x 500/ = 15000/= -photocopy 30 pages x 50/-@x 50 = 75000/= **Total = 453,000/=**

	Training tree nurseries group members and village leaders.	Training material, Participants. Transport, Venue Facilitators Stationeries	-Allowance 2 staff x 15000 x 6 =180,000/=. -Venue 20,000.x 6 days= 120,000/= -Transport fuel 40lts x 1700=68,000/= -Lunch 100parts x 3000/ x3day =900,000/= Stationeries 100 parts x 600/- =60,000/= 2 Flipchart = 16000/= 2 boxes marker pen = 10000/= **Total = 1, 054,000/=**
Increase awareness and involvement of community on afforestation activities by the end of 2011	Tree nurseries establishment/ tree seedling production.	Seeds, Polythine tubes, manpower, soil ingredients, water, land, watering cane, spades, manure, hoes, buckets, knives, rakes and nursery sites. Transport Technical known how	-Seeds 5kg of seeds x 25000=125,000/= -Polythine tubes 150kg x 4000/- =600,000/= -Watering can 15 w/can x 6000 =90,000/- -Spades 10 spades x 5000/ = 50,000/= -knives 20 knives x 1000 = 20,000/= -Buckets 15 buckets x 3000 = 45,000/= -Transport Fuel 30 lts x 1700= 51,000/= **Total = 981,000**

	Distribution of tree seedlings for planting in the field.	Transport, Time. Technical known how, Fund .	Transport Fuel 70 lts x 1700= 119,000/= Driver allowance 1driver x 12500/x 4days = 50000 **Total = 169,000/=**
Increase awareness and involvement of community on afforestation activities by july, 2011	Monitoring of activities	Transport, Stationeries, staff	-Stationeries 2 rims p/copy x 8000=16,000/- 10 notebooks x 800 = 8000/- 1 Flip chart x 9000/ = 9000/- -Transport Petrol 50 lts x 1800/- = 90,000/ **Total = 123,000/=**
	Evaluation of project implementation	Evaluators, Stationeries, Transport.	-Allowances 1staff x 30000/- x 2=60,000/= - lunch 10pax x3000/-x 2 = 60000/= -Stationeries 1 rims p/copy x 8000=8,000/- 10 notebooks x 800 = 8000/- Fuel 40lts x 1700/- 68,000/- **Total = 204,000/-**
To have effective administration and communication aspect	Field officer incentive.	Allowances	-allowances 40,000/-x 12 x1 = **480,000/=**
	Communication and other accessories	Telephone	100,000/=
GRAND TOTAL			**3,899,700/=**

Appendix 9: The organization chart of LEPAJE CBO



Appendix 10: Actual project implementation activities

Plan			**Accomplishment**		
Objective	**Outputs**	**Activities**	**Performances**	**Means of verification**	**Comments**
1. To implement awareness creation programs and involvement of communities on tree planting activities by July 2011.	The leaders become aware of the project and agree the project to be undertaken.	To conduct workshop for introduction of project at Ward level.	-One workshop conducted at ward level and a total of 45 participants attended.	-work shop report -monthly report	Community leaders and stakeholders accept the project
	The communities become aware of the project and agree the project to be undertaken	To conduct village general meetings in five villages one in each village.	- 5 general meetings conducted, one in each village with a total of 820 participants	-Meeting minutes	Attendance was not good due to insufficient support from leaders at village and hamlet level.
	Democratic Groups formed (youth, women, men)	To mobilize community to form voluntary Groups in each village	-10 tree nurseries groups formed with a member between 20 to 30	-Monthly report -Observation	In each group formed number of woman were higher than men
	Produced 600 brochures and 600 leaflets	Production and distribution of brochures and leaflets.	- 350 brochures and 250 leaflets produced and distributed	Monthly report -Observation	The cost of production per unit was higher than planned
2.0 To training 100 tree nursery group members on tree nursery operations and tree planting by July 2011.	Produced training materials	Prepare training materials by collaborating with DFO and other stakeholders	Nursery operation training material produced.	- Secretariat report - observation	This was done in collaboration with other stakeholders and DFO Moshi rural District.

	100 participants trained on tree growing technical knowhow.	To conduct training on tree growing technical know-how to 100 participants from five villages.	82 group members, 12 participants from institution, 15 village and ward leaders and 10 individuals trained on tree nursery operations and tree management.	Training report	Training conducted in 3 different centers, Other participants attended with their own cost
3.0. To establish 10 tree group nurseries and 15 individual nurseries with total of 100000 seedlings by December 2011	Obtained materials for tree seedlings production	Purchase materials for tree seedlings production. (seeds, polythine tubes, watering canes, spades, rakes)	150kg of polythine tubes,15 watering can 10 spades, 5kg of seeds were purchased and distributed to groups, institution and individuals	-Receipts -observation -field office report	Other nursery equipments and material were obtained from the communities as cost sharing.
	25 tree nurseries established with 100,000 tree seedlings produced	100,000 Tree seedlings produced by groups and institutions	A total of 44 tree nurseries were established with 120,000 seedlings	- Observation - Reports	
	Deforested land be reduced, Increased number of planted trees	100,000 tree seedlings distributed for planting in the field.	75000 tree seedlings distributed and planted on the farm, river banks and along the road	Field visit -observation -field officer monthly report	Other seedlings still small, it will be planted during rain season October to December 2011

Appendix 11: Monitoring plan

Objective	What to monitor	Indicators	Data source	Method/ tools	Responsible parties	Resource	Time frame
1.0 Increase awareness and involvement of community on importance of afforestation by the end of July, 2011	How many workshops conducted?	Number of workshop conducted. .Number of participants attended.	-Monthly report. -Workshop report from secretariat. -Attendance register	Record review. Interview.	Facilitator. Project committee	-Transport. Stationeries	November 2010
	How many assembly meetings were conducted?	Number of meetings conducted. Number of participants attended.	-Monthly report. -Meetings minutes -Attendance register	Record review.	Facilitator. Project committee	Transport. Stationeries	November 2010
	How many individual are ready for forming tree nursery groups?	Number of individual read to form tree growing groups.	Project progressive monthly report. Visit report	-Record review. -Interview	Facilitator. Project committee LEPAJE	Transport. Stationeries	November 2010
	What were the responses towards afforestation from beneficiaries?	% of beneficiaries accept the idea of tree growing	Project progressive monthly report.	Record review. Focus group discussion	Facilitator. Project committee LEPAJE.	Transport. Stationeries	November 2010

2.0 To training 100 tree nursery group members on tree nursery operations and tree planting by july, 2011.	How many training conducted?	Number of training conducted. .Number of participants attended.	-Monthly report. -Training report from facilitators.	Record review. Observation. Interview.	Facilitator. Project committee	Transport. Stationeries	December 2010
	How many training material prepared?	Number of training material prepared.	-Monthly report.	Record review. observation	Facilitator. Project committee	Transport. Stationeries	December 2010
	What learning has been drawn from the community?		-Visit report	Observation. Interview.	Facilitator. Project committee	Transport. Stationeries	December 2010
3. 0 To establish 10 tree group nurseries and 15 individual nurseries with total of 100000 seedlings by December, 2011	What kind of equipments, tools and materials obtained for tree nurseries establishment.	Number of material, equipment and tools purchased.	-Monthly report. -Receipts .	Observation -Interview.	Facilitator. Project committee	Transport. Stationeries	January 2011
	Distribution of tree nursery materials and equipment to the groups and institutions	Number and type of materials, equipments distributed	-Monthly report.	-Observation -Record review.	Facilitator. Project committee	Transport. Stationeries	January to February 2011

Appendix 12: Project Evaluation worksheet

Goal/objective to be achieved	**Activities needed to be performed**	**Information needed**	**Information sources**	**Methods/techniques**
Environmental awareness creation programme successfully implemented	-Conducting of community meetings -Conducting workshops. -Production and distribution of relevant information materials brochures and leaflets. -Formation of tree nurseries group	-Number of sensitization meetings conducted -Number of workshop conducted. -Contents of the educational materials. - Number of groups formed	-Monthly, quarterly and annual reports. -Sample of material available	-Documentary review. -interviews. -Discussions. -observations
Farmers and groups trained in specific skills to enhance tree nurseries and tree planting activities	-Preparation of training material. Training groups on tree nursery operations	-Number and type of training provided. -Facilitators competence. -Number of farmers trained. -usefulness of training provided.	-Implementation reports -Monthly and quarterly reports	-Reviews of reports -Interviews -observation
To explore whether tree planting intervention has increased	-Number of tree nurseries established. -Number of tree seedlings produced. -Area planted trees. - Number of tree seedlings planted	-Number of tree nurseries and seedlings produced. -Number of farmers planted trees -Area and number of seedlings planted - Increases of vegetation cover.	Implementation reports	-Reviews of reports -Interviews -observation

TO explore whether the capacity enhancement to farmers on afforestation interventions increases income and improves livelihood of the communities	To conduct household income survey.	-Water flow increases. -Soil fertility increases. -Cash and food crops productivity increased. -Income of communities increased.	-Reports -Transect walk -Survey report -Monitoring reports	-Documentary review. -interviews. - Informal discussions. -Observations -Survey
Explore whether capacity building and awareness creation have a negative impact towards deforestation.	To conduct knowledge attitude and practice survey.	-Change of communities knowledge, behavior and attitude towards deforestation -Deforestations reduced	-Reports -Transect walk -Survey report -Monitoring reports -formal and informal discussions.	-Documentary review. -interviews. - Informal discussions. -Observations -Survey

Appendix 13: Evaluation interview checklist

1. Interviewee name and title……..…….……..
2. Date of interview and place……..……..……..…….
3. Do all farmers participate in tree planting activities?
4. Seedlings availability increases?
5. Material for raising seedlings provided was it enough?
6. Do all farmers participate in implementation of the project?
7. Do all objectives achieved and resource used effectively?
8. What lesson have you learnt in this project?