THE OPEN UNIVERSITY OF TANZANIA

&

SOUTHERN NEW HAMPSHIRE UNIVERSITY

MASTER OF SCIENCE IN COMMUNITY ECONOMIC DEVELOPMENT

ASSESSMENT OF A COMMUNITY BASED WATERSHED MANAGEMENT PROJECT, A CASE STUDY IN KELAMFUAMOKALA WARD, ROMBO DISTRICT – TANZANIA.

A PROJECT SUBMITED IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE MASTER DEGREE OF SCIENCE IN COMMUNITY ECONOMIC DEVELOPMENT (2007)

ADIL ELIREHEMA MWANGA.

CERTIFICATION

Undersigned certify that he has read and hereby recommend for acceptance by the Southern New Hampshire University and The Open University of Tanzania a project paper entitled Assessment of Community Watershed Management Project in Kelamfuamokala ward in Rombo District, Kilimanjaro Region – Tanzania. In partial fulfillment of the requirement for the Degree of Masters of Science in Community Economic Development (MSC - CED)

.....

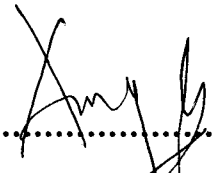
Dr.J.A.Kisoza

22nd Oct, 2007

Date

DECLARATION AND COPYRIGHT

I Adil Elirehema Mwanga I declare that this project report is my original work and that it has never been presented and will not be presented to any other university for similar or any other degree award



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Adil Elirehema Mwanga

.....17/10/2007

Date

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Lastly I will never forget the moral support and encouragement given by my children Samwel Adil Mwanga, Haikaeli Adil mwanga and my lovely wife Ester Wales Mwanga.

DEDICATION

This work is dedicated to my beloved wife Esther Walles Mwanga and my lovely children Samwel Adil Mwanga and Haikaeli Adil Mwanga without forgetting my dear mother Emima Elirehema Mwanga.They all displayed a highly valuable sense of pray and patience during my study and they were always a source of encouragement through out my life.

I love them all

ABSTRACT

The degradation of water resources and increasing water scarcity are the major threats to the welfare of community in Kelamfuamokala ward in Rombo District - Tanzania. Given this situation, a Non Governmental Organisation (NGO) "**Development Investors Through Environmental Conservation**" (**DITEC**) embarked on a project aimed at facilitating Sustainable Integrated watershed Management. The activities of the project includes; water source protection, establishment of on-farm tree nurseries, aforestation activities and reinforcing by laws and principal legislation on water and environment management. The methodology used in the research of this project includes, the collection of information from the community through Participatory Rural Appraisal (PRA) and interviewing of selected groups and individuals by structured questionnaires and established checklist questions.

The findings from the research show that mismanagement of watershed areas has resulted into lack of adequate water for community use. The recommended solution to the problem is to introduce a Participatory Integrated Watershed Management (PIWM) skill. Some immediate recommendations was to introduce a systematic capacity building for the project staff and to the community and to use more holistic approach in developing a master plan for Integrated Watershed Management at village level

In order to have a good impact on this organizational structure it is important to concentrate the effort in a limited area such as, ward, villages and to the specific watersource point.

EXECUTIVE SUMMARY

Kelamfuamokala ward is one among the twenty ward of Rombo District. The District is one of six administrative districts in Kilimanjaro Region. Rombo District is bordered by the Republic of Kenya in the North and East, Moshi Rural District in the South West, Hai and Monduli Districts in North West. This ward implementing watershed management project which is under DITEC. Development Investors Through Environmental Conservation (DITEC) decided to embark on this project to facilitates sustainable water source management/watershed management in the ward. The main activities activities of the project includes; water source protection, establishment of on-farm tree nurseries, aforestation activities and reinforcing by laws and principal legislation laws on water and environment management. The experience obtained during the Participatory Rural Appraisal (PRA) conducted in these in Kelamfuamokala ward have shown that, much effort have to be directed to the capacity building in the community on the above mentioned activities.

The main objectives of this project is to raise awareness of communities on the watershed management and conserving water source areas in Kelamfuamokala ward by the year 2010.On analyzing this objective different literature were sited basing on Theoretical Literature, Empirical Literature and Policy Literature review.

The survey designed of this project was mainly focused on the methods of collecting information from the community through Participatory Rural Appraisal (PRA) and interviewing of selected groups and individuals by structured questionnaires and

checklist question for open ended surveying method. Observation and oral information for the purpose of this survey was also applied.

The result of the survey and the discussion was divided into four main sections, namely, Basic information from field survey, Watershed management Practices, Information on the important measure to be undertaken to mitigate the problem of watershed management in the project area and Information on important activities to be undertaken by the project. The general result show that the survey comply with the established objective of the survey i.e. Community need to have a good knowledge on the watershed management

The achievement of implementation of the project for 2006 shows that there rehabilitation of 11 watersouce areas, fixed permanent boundaries for 5 water source /streams, there 7 Private/Individuals tree nurseries, and 6346 tree were raised also establishment of participatory land use management plan for 3 villages have been done.

LIST OF ABBREVIATIONS

1. CBFM - Community Based forest management
2. CBO - Community Based Organisation
3. CAN - Community Need Assessments
4. DED - District Executive Director
5. DITEC - Development Investors Through Environment Conservation
6. DNED - District Natural Resource and Environment Department.
7. ERP - Economic Recovery Program
8. FFS - Farmers Field School
9. JFM – Joint Forest Management
10. KEDA – Kilimanjaro Environmental Development Association
11. LAMP – Land Use and Agroforest Management Project
12. LEPP – Local Environment Protection Program
13. MDG – Millennium Development Goals
14. MNRT – Ministry of Natural Resource and Tourism
15. NGO – Non Government Organization
16. PFM – Participatory Forest Management
17. PRA – Participatory Rural Appraisal
18. RDC – Rombo District Council
19. SIDA – Sweden International Development Aids
20. SWORT – Strength Weakness Opportunity and Threats
21. TECOSSO – Tarakea Environmental Conservation Society

22. TFAP – Tanzania Forest Action Plan

23. UNEP – United Nations Environment Program

24. VEC – Village Environmental Committee

25. WMP – Watershed Management Project

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CHAPTER ONE

1.0 INTRODUCTION

Watershed Management is an iterative process of integrated decision making regarding uses and modifications of lands and water within watershed areas. This process provides a chance for stakeholders to balance diverse goals on the uses of environmental resources, and to consider how their cumulative actions may affect long term sustainability of these resources. The Guiding Principles of the process are Partnerships, Geographic focus and Sound management

The degradation of water resources and increasing water scarcity are the major threats to the welfare of community in Rombo Districts. Given this situation, a Non Governmental Organisation (NGO) called Development Investors Through Environmental Conservation (DITEC) decided to implement the project that facilitates sustainable water source management/watershed management. This organisation is initially working in three villages namely Mokala, Maharo and Shimbimasho in Kelamfuamokala ward in Rombo District Tanzania. The activities of the project includes; water source protection, establishment of on-farm tree nurseries, aforestation activities and reinforcing by laws and principal legislation laws on water and environment management.

In this study the survey designed was mainly focused on the methods of collecting information from the community through Participatory Rural Appraisal (PRA) and

interviewing of selected groups and individuals by using designed research questions and checklist questionnaire for open ended survey method. Observation and oral information methods were also applied in the collection of data.

Water can be viewed both as fundamental ingredient for ecosystem health and as a catalyst to economic development. As such it makes a critical contribution to human welfare. To reduce the gravity of watershed mismanagement in the area DITEC decided to embark on project that facilitates sustainable watershed management. This project was recognized in the revised water policy, the details of how this project is working is discussed in chapter five of this study and it is emphasising that water resources management needs to be integrated across all relevant sectors and needs to be applied at all community level.

1.2 COMMUNITY NEEDS ASSESMENTS

Introduction

Community needs assessments is an essential process in establishing any project, the essence of caring this process is to assure that, the project is respond to a community real needs and confirm whether there is existing direct documentation of this needs, or whether community leaders/stakeholders would recognize it as a true needs and accept it as their own. The need of the community is direct linked to the problem identification which can be developed to be a project.

Background to the community Based Organization

DITEC is a registered Non Government Organization which incorporates other development needs of the community with the real concept of Environmental Conservation. DITEC had provides useful administrative link to implement watershed management project activities and transfer the necessary knowledge to the farmers at he grass root levels. DITEC organization is currently working in Rombo ,Mwanga and Siha Districts in Kilimanjaro region - Tanzania. The farmers in the targeted areas are the major targets groups of the project.

The experience obtained during the Participatory Rural Appraisal (PRA) conducted in Kelamfuamokala ward shows that, a higher effort have to be directed to the capacity building in the community on the above mentioned activities .The experience also has indicated that, this project was highly appreciated by community and it has a high reputation and good values to them.

Watershed Management Project falls in line with Tanzania Natural Resources and Environmental policy which calls for collaboration between Governments, Local community Environmental Institutions and religions in expanding more efforts on protecting the existing watershed areas and other natural resources. It also requires improving and strengthening the relationship between the environmental related sectors.

The Rombo District Environmental Strategic Plan which has to be incorporated in this project includes;

i) Tree Planting in the view of improving soil conservations and managing the deterioration of environment in residential areas.

ii) Enforcement of by laws and principal legislative laws pertaining to environmental conservation and watershed management to the community.

DITEC vision and Mission support water policy which is aiming on providing clean and safe water nearer to Community homestead at the stated distance of 400 meters and to involve all communities. Currently the district has reached only 57 percent on supplying water to its residents. The Research conducted by DITEC has revealed that out of 38 water source point existed in 2001, currently there only 13 water streams which discharge water throughout the year in the District. Proper management of watershed areas can be the only permanent and proper solution to this entire problem.

DITEC plans include actions necessary to develop an effective frame work of policy; this includes legislation, financing structures and capability of the organization with clearly defined roles and set of the management instruments.

1.3 COMMUNITY PROFILE

1.3.1 A geographical Location

Kelamfuamokala ward is one among the twenty ward of Rombo District. The District is one of six administrative districts in Kilimanjaro Region. Rombo District is bordered by the Republic of Kenya in the North and East, Moshi Rural District in the South West, Hai and Monduli Districts in North West. The total area of the

Districts is 99,000 hectors which can be divided into three agro ecological zones, namely low land, middle land and high land (Mwanga A.E.2003). The agro-ecological zones characterized in terms of topography, altitude, soil fertility, rainfall pattern, temperature and population. Both two peaks of Mount Kilimanjaro which are Kibo and Mawenzi are located in Rombo District. Mount Kilimanjaro has 5895 meters above undulating plains and it cover 39,194 hectors, these area acts as a water source/catchments forest area, out of that 44,114 hectare's are suitable for cultivation, 38,194 hectare's are covered by forests, whilst 16,692 hectare's are for livestock production. The research has shown that 11,000,000. m3.of water streams discharged daily from this area (UNF 2003).

1.3.2 Land use distribution

The table below indicates that forest reserve (Kilimanjaro Forest Reserve) cover large area of 38,194ha. Compared to other land use pattern.

Table 1.Land use Distribution

ACTIVITIES	**AREA USED**
Artificial/ Planted Forest	7,200
Forest reserve	38,194 Ha
Water	200 Ha
Infrastructure	28,820 Ha
Total	**74,414 Ha**

Source: Rombo District Council **2006**

1.3.3 Rainfall pattern.

Rain fall pattern varies throughout the district regarding ecological zones. short and long rains ranges between 500 mm to 1,600 mm .This is not sufficient for high agriculture production. the district is located on the lee ward side of Mount Kilimanjaro.

1.3.4 Administrative units

Administrative units of Rombo district consists of 5 divisions. 20 Wards. 60 Registered Villages and 300 Hamlets. According to recently population census conducted. the district had population of 246,479 people out of which 116,859 are males, and 129,620 females. The available population density is estimated to be 26 persons per Square kilometres, this is the highest population in Tanzania, with annual growth rate of 2.8%. Appendix IX shows population by sex by board age group. Information for this table comes from the 2002 Tanzania Population and Housing Census. 49 percent of the total population is under age 15 and only 4 percent is over 65 years of age indicating a high age dependency ratio.

1.3.5 Agriculture

The ward is almost depended on agriculture and animal husbandry which are locally practiced in rural areas at subsistence level. According to recent survey the average farm size varies from 0.25 – 1.0 acres. Household income is influenced by crops

yields. The agriculture is characterized by low yields parallel to land and climate limitations.

Banana is main cash and subsistence crop, followed by coffee. Other crops include Sorghum, cassava and beans in the lower zone of the Ward.

Agriculture production which is solely source of income to the poor strata is adversely hampered by various factors including: adverse weather (refer to rainfall pattern). Most of rainfalls are short lived leaving cultivated crops to dry.

1.3.6 Water sector

The existing water supply services in Rombo district are not adequately sufficient and reliable as only 45% of the population is access to clean and safe water, at present the district owns three boreholes where only two are functioning. 27 sources of spring water which are actively only during the rain seasons whilst in event of dry seasons the yields decreases from 20.000 cubic litters to 10.000 cubic litres per day. The current supply to entire population is 12.335.000 litres per day equivalent to 50 litres per each household, calculated to the total number of 247 households present.

Insufficient supply of water is contributed by:

(i) Inadequate supply from its water sources.

(ii) Absence of large reservoirs (e.g. Lakes, Ponds & Dams) to draw water and distribute to members of population.

1.4. Research methodology used in community needs assessment

The survey designed of this project was mainly focused on the methods of collecting information from the community through Participatory Rural Appraisal (PRA) and interviewing of selected groups and individuals by structured questionnaires and checklist question for open ended surveying method. Observation and oral information for the purpose of this survey was also applied. This chapter present also the analyzed result and describes the findings of the study. The chapter is divided into four main sections, namely, Basic information from field survey, Watershed management Practices, Information on the important measure to be undertaken so as to mitigate the problem of watershed management in the project area and the Information on important activities to be carried out by the by the project which is directly link with the objectives of the study and research questions. The overall objective of this project was to raise awareness of communities on the watershed management and conserving water source areas in Kelamfuamokala ward by the year 2010.The research questions were, Causes of Poor watershed management practices, Impact of improper/poor watershed management practices Measures to mitigate problem of poor watershed management and what are the specific activities to be undertaken by the project in the ward.

1.4.1 Participatory Rural Appraisal (PRA)

Participatory Rural Appraisal (PRA) were conducted in three villages located near to Mount Kilimanjaro in Rombo District in the Community Need assessments

(CAN). the villages were Mokala. Maharo and Shimbimasho .DITEC organization members. Villages Environmental Committees (VEC).Village leaders.Religeon leaders and Village s influential people were involved in the PRA and needs assessments and developing problem statement of this study. The experience obtained during the Participatory Rural Appraisal (PRA) conducted in this ward shows that. a lot of effort have to be directed to the capacity building in the community on the above mentioned activities. During PRA the participants look on different measure which they can apply on the implementation of the itemized activities. Note that. cross section diagrams of all watershed points in the three villages were drown and established with specific measures to be undertaken in each point.

1.4.2 Questionnaire interviews

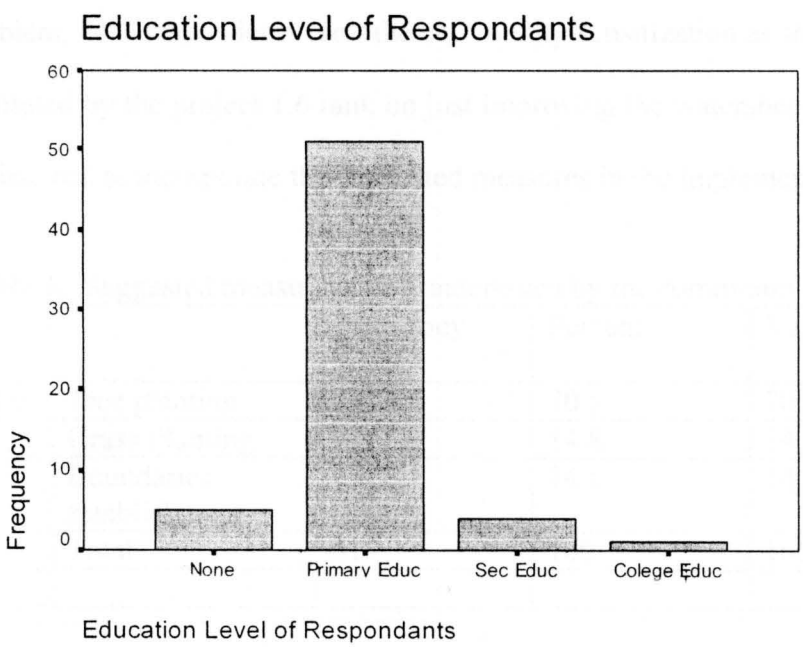
Figure 3 bellow give a good indication on the education background of the respondents. out of 61 individuals interviewed on education status. 51(83.6%) individuals have completed primary school.5(8.2%) have acquired adult education.4(6.6%) have attended secondary schools while only 1(1.6%) individuals have acquired college education. that is diploma and degree level. People with higher education have a high wiling of community economic development contribution compared to people with lower standard of education.

Table 2. Education Level of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None	5	8.2	8.2	8.2
	Primary Education	51	83.6	83.2	91.8
	Secondary Education	4	6.6	6.6	98.4
	College Education	1	1.6	1.6	100
	Total	61	100	100.0	

Source: Field Survey **2006**

Fig.1



Source: Field Survey **2006**

The information on the household number of people indicates that there 41% with number of household less than 5 and 52% of household have number of people range from 5 to 10 while there only 6.6% of household with number of people above 10 .Household number of people is related to the use of fuel wood, that the higher number of household course higher consumption of fuel wood and therefore it is easy to cause deforestation and destruction of water source point.

Figure 11 bellow give illustration on the types of measures recommended by the respondents in order to reduce the problem of improper watershed management in the project area.54.1 respondents rank enforcement of the environmental by laws sensitization as the first measure to be undertaken by the project in order to reduce the problem, 44.1 respondents rank the community sensitization as the second measure to be instituted by the project 1.6 rank on just improving the watershed areas. This reveals that project has to incorporate the suggested measures in the implementation of its activities.

Table 3. Suggested measures to be undertaken by the community

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Tree planting	43	70.5	70.5	70.5
	Grass Planting	9	14.8	14.8	85.2
	Boundaries establishment	9	14.8	14.8	100
	Total	61	100	100	

Source: Field Survey **2006**

1.4.3 Cross sectional design

This method involves collection of data at single point of time. It helps to assess the preference of the target member on a particular intervention programme including environmental program

The design has the following benefits

- It revealed directly the general feeling of the target group and it becomes easier to change it.
- Cost effective and it is easy to survey and it is not repetitive

1.4.4 Experimental and Observational design

Observational Method was used in this survey, 0bservation approaches allow the evaluators to learn about issues the participants or staff may be unaware of, or that they are unwilling or unable to discuss in an interview or focus group. The advantages of Observation Method are ,It provide direct information about behavior of individual and group, permit the evaluator to inter into and understand situation/context, provide good opportunities for identifying un anticipated outcomes, exist in natural,unstructured,and flexible setting.

1.5 Administration of the survey

There were four survey administrators

Administrator	Level of Education	Working Experience
CED student	Msc CED	16 years
Forest Officer	Diploma in Forestry	23 years
Land Surveyor	Certificate in land Surveying	4 years
Forest Officer	Certificate in Forestry	21 Years

1.5.1 Characteristics of quality assurance methods

- Participatory approach to data collection
- Questionnaire pre-test
- Setting clear objectives of the survey
- Friendly environment between respondents and interviewees

1.5.2 Methods of data collection:

- **Observation Methods**

  Observation was used to explore the real situation of watersource areas in relation to environmental degradation made

- **Record review**

  The method/instrument were used to study the performance of DITEC over a specified period of time so as to enable making a trend analysis

- **Focus group discussion**

  Member of DITEC were also interviewed in groups and the subject matter was thoroughly discussed by both the interviewer and respondents

1.5.3 Method of data presentation

These include reproducing a summarized version of the questionnaire and its responses, tables, pie diagrams, bar and line graphs and picture.

1.5.4 Methods of analysis of the findings

Coding:

In coding method the responses were assigned numerals symbols so that they can be put into a limited number of categories or classes. SPSS computer package was used for data analysis.

1.6 Research methodology

1.6.1 Research design – Cross – sectional

The sample of cross section of the population was surveyed through the above mentioned methods which are Participatory Rural Appraisal (PRA) and interviewing of selected groups and individuals by using designed surveying questions and checklist questionnaires for open ended surveying method. Most of the respondents had literacy skills and thus were provided with questionnaire to fill. This exercise was conducted with the view of collecting the relevant data, which explains the relevance of the community to manage watershed areas.

The data was collected by using the following methods:

i. Various office documents were reviewed in order to get appropriate information's. Information's were collected from DITEC office, District council office, Pangani Basin office and from KEDA and CONVERT Sisters Organisation. These are the organisations which are working in the similar objectives.

ii. Questionnaire forms were distributed to selected individuals, NGOs and CBOs offering service in Kelamfua Mokala Ward in Rombo District.

iii. Observation and physical visit was done to various environmental activities and water source sites.

The informations collected were analyzed by using SPSS computerized data analysis system (Database), interpreting the data and preparing this findings report.

1.6.2 Choice of population or sample (representative sample)

The survey population was selected randomly, random sampling was recommended because it is not biased in obtaining scientific and social information. In simple random sampling people were selected randomly by using random numbers, groups like primary schools were also selected for interview by using random sampling methods. After pre-testing the questionnaire, the questionnaires forms were distributed to selected individuals living in Kelamfuamokala namely Mokala, Maharo and Shimbimasho Villages, the questions were planned to reveal the local

awareness and responses to the problems, values of watershed management, need for watershed management, and opportunity for watershed management project in settling the land use problems. Selected samples of 61 people were picked to represent 3 villages in Kelamfua Mokala ward.

As indicated earlier the population sample for the survey was cross section. This was to enable to obtain a wider perspective views towards community participation. The total number of the population sample selected as 61 individuals was represented 5% of the households. Among the respondents 30% were males and 70% females

1.6.3. Reliable and valid instrument

Reliability and validity of information provided were measured by compare information of respondents among the different groups and the physical observation method used to ascertain the validity and reliability of the respondences. By directly observing the operations and activities, the evaluators develop a holistic perspective that is an understanding of the context within which the project operates. After analyzing data the information obtained were critically viewed to test truth ness of the data obtained from the respondants.Also the information's gathered were compared with the documented findings at the initial stage of the project with various stakeholders, and findings of other similar project carried within the region.

1.6.4 Accurate reporting of result

For the software equipments used a technical coefficient in accurate indicated was used to rank the rate of accuracy. High percentage of response plays an important element in determining the accuracy of results to be presented. The rate of respondents received was above 70% this indicate that the information collected was very accurate. The presentation of the survey results was done orally and in written report

1.6.5 Characteristics, benefits and concerns of the design of the survey

The community of the sampled area were directly involved right from the beginning of the survey, the benefit of this fall on making a basic sense of ownership of the project to the community. Motivation and payment issues were clearly ruled out and this was accepted by all the participants who are willing to commit themselves in this project.

Another advantage of using the design was seen in the saving of time, it enabled to survey and obtain information among a number of selected groups in short time.

In carrying out the survey Cross-sectional Design data were collected at one point in time. This was preferable tool due to the limitation of time as well as it provides a portrait of information at a single point in time across a number of groups.

1.6.6 Comparison Group Design

This design was applied in the form of Normative in comprising group's i.e. males' and females

1.6.7 Internal and External validity of the survey

External validity produces results that apply to the surveys targeted Population.

In internal validity, the following measures were included:

i. Indicate the main question , the type of design (choose from descriptive survey, correlation study, pre-experimental design and quasi-experimental design

ii. Give the independent and dependent variables

iii. Describe the problem(s) with the study by indicating which internal validity categories are problematic.

iv. Consider whether other categories are or are not controlled for. That is, do either features of the design or the results themselves make potential problems in a particular category unlikely

v. Finally, to think about how we might redesign the study to better handle any issues

The pilot testing of the survey was also using people outside the scope of study was expected also to bolster validity, as it has helped to ensure that the relevant issues are included and sufficient variety in response is available. In addition a number of surveys of the issue of community participation have been conducted of which its information provide base of external validity

One way of ensuring that the results of the survey apply to the community, the survey look on the consistence of information received from the respondents. The

information received from them provides consistent measure of important characteristics.

1.6.8 Internal validity was free of non-random error or bias.

An individual has chance for being surveyed due to his or her availability. In selecting individuals who are thus the representative of the sample. different stakeholders were considered. the stakeholders of this project includes:

i. Communities of three villages Kelamfuamokala ward
ii. Three primary schools located in the ward
iii. Mkuu Secondary School
iv. Mkuu Roman Catholic Church
v. Women groups
vi. TECOSO
vii. KEDA
viii. Ng. ambeni Environmental Group.

To ensure that the internal survey is true free of non-random error. members within the groups earmarked for survey were given equal chance of being selected. The population statistics has also been considering during the survey

1.6.9 Choose the appropriate probability and non-probability sampling methods;

Selecting the best method for collecting surveys require weighing a number of factors. These included the complexity of questions. resources available. the project schedule and security concern within the area. these all have been accounted in this

survey. A probability sample is one in which each person in the population has an equal chance of been selected, the resulting sample is said to be representative. In random sampling which is the method used in this survey individual are selected randomly using random numbers.

The type of sample selected and applied in conduct this study was simple random Sampling, the reason for preferring this type was the number of the population used was small to be able to use other methods. Also time factor and easiness to apply were considered.

1.6.10 Conclusions

It is necessary to control the weakness which might occur in the field where wide gape of technical knowledge between the farmers and the extension workers who translate the questions can bias the result. The farmers might be not always able to give the answer required for some of the questions and the farmers may also feel intimidated or wanting to give answers to please the enumerator who are the government or Non government extension workers leading to exaggerated problems. These all have been taken into account in the designing of this survey in order of getting good result.

1.7 BASIC INFORMATION FROM FIELD SURVEY

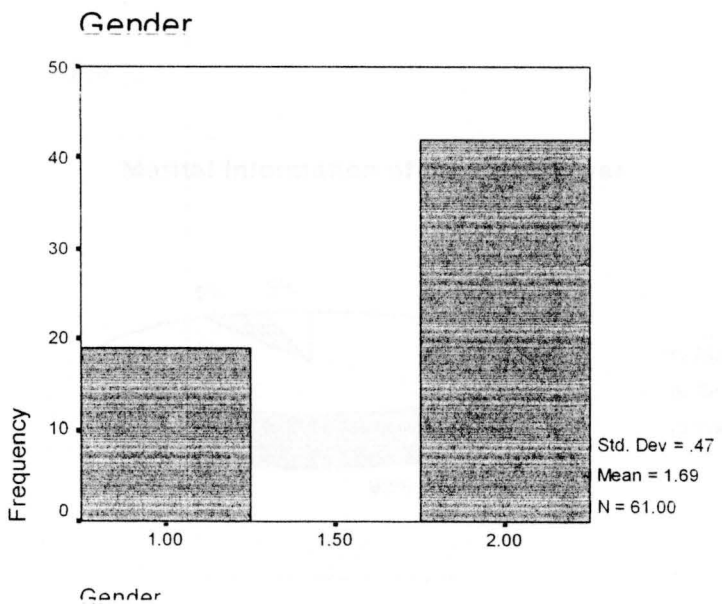
Table 4: Gender of the respondents

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Female	19	31.1	31.1	31.1
	Male	42	68.9	68.9	100
	Total	61	100.0	100	

Source: Field Survey **2006**

The total number of the population sample selected as 61 individuals were represented 5% of the households. Among the respondents 31.1% were female and 68.9 % male. The sampling fraction of 5% is technically acceptable in representing on ground situation.

Fig.2:Gender relation.



Source: Field Survey

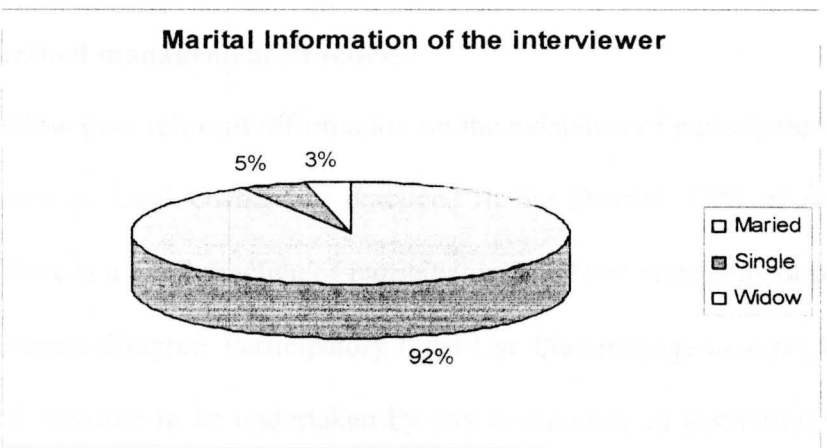
Table 5. Age of Respondents

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Bellow 20	8	13.1	13.1	13.1
	Age 21-50	32	52.5	52.5	65.6
	Age 51-80	21	34.4	34.4	100.0
	Total	61	100.0	100.0	

Source: Field Survey **2006**

Figure 2 below gives social information on the marital status of the people in the surveyed area. it has been indicated that 92% of the adult people were married. 5% were not married/single while only 3% are widow. Information on marital status has significant important on community Economic Development Programs.Maried individuals are interested to give development contribution compared to other groups.

Fig 3.



Source: Field Survey

The information on the household number of people indicates that there 41% with number of household less than 5 and 52% of household have number of people range from 5 to 10 while there only 6.6% of household with number of people above 10 .Household number of people is related to the use of fuel wood, that the higher number of household course higher consumption of fuel wood and therefore it is easy to cause deforestation and destruction of water source point.

Table 6. Number of people per Household

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Below 5	25	41.0	41.0	41.0
	Range 5 - 10	32	52.5	52.5	93.4
	Above 10	4	6.6	6.6	100
	Total	61	100.0	100.0	

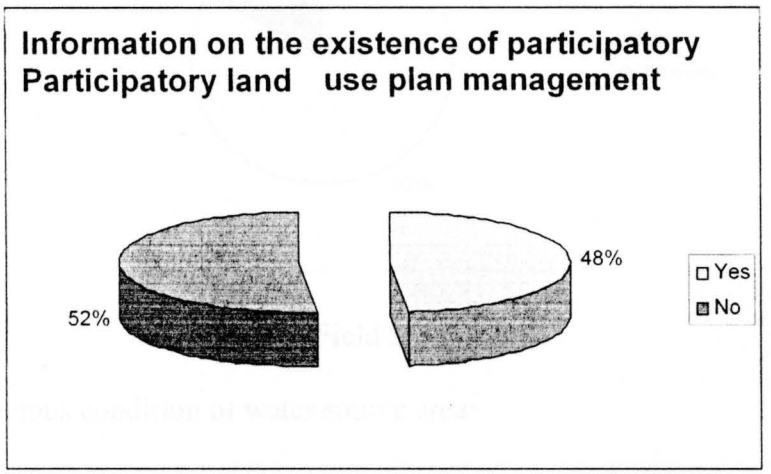
Source: Field Survey **2006**

1.7.1 Watershed management Practices.

Figure 4 bellow give relevant information on the existence of participatory land use plan and type of Land Ownership practiced in the District. 52% of respondents agree that there is a good practice of participatory land use management plan, while 48% respondents disagree. Participatory Land Use Plan management (PLUPM) is a fundamental measure to be undertaken by any community in instituting watershed management programs. Watershed Management is an iterative process of integrated

decision-making regarding uses and modifications of lands and water within watershed areas. This finding calls for improving sensitization effort to the community on watershed management in the project area.

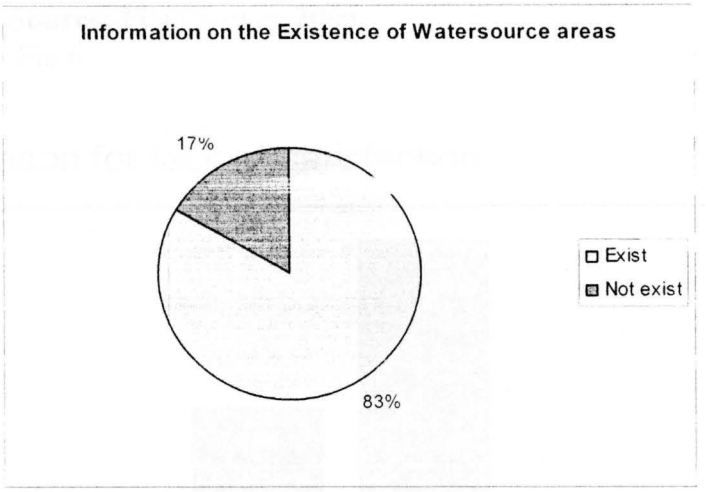
Fig 4.



Source: Field Survey **2006**

Community were asked to give information on the efficiency of activities in watersourse areas in their respective villages and giving comparison of watersourse management for ten years back.83 respondents agree that there existence of watersourse areas in their villages while only 17% disagree, on the other hand 33(52%) respondents out of 61 complains on the poor watershed management practice compared to the previous years. Proper Watershed Management is a good process to provide a chance for stakeholders to balance, diverse goals and uses for environmental resources, and to consider how their cumulative actions may affect long-term sustainability of these resources. Fig 5, 6 and 7 give details of this information.

Fig 5.



Source: Field Survey **2006**

Table 7. Previous condition of water source areas

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Good	53	86.9	86.9	86.9
	Fair	7	11.5	11.5	98.4
	Not Good	1	1.6	1.6	100
	Total	61	100	100	

Source: Field Survey 2006

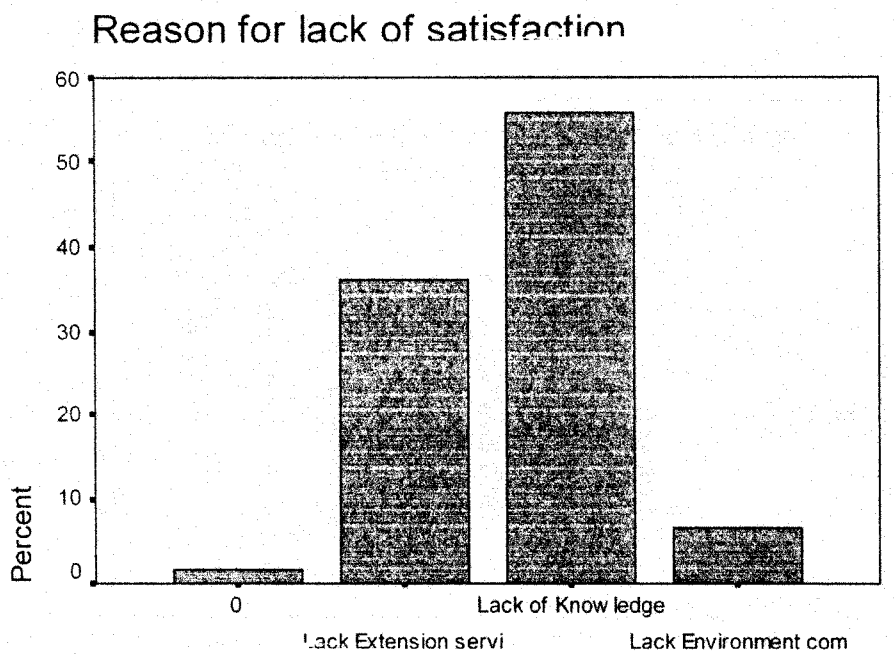
Table 8. Reason for lack of satisfaction

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	0	1	1.6	1.6	1.6
	Lack Extension services	22	36.1	36.1	37
	Lack of knowledge	34	55.7	55.7	93.4
	Lack Environmental	4	6.6	6.6	100

	committee				
	Total	61	100.0	100	

Source: Field Survey **2006**

Fig 6.

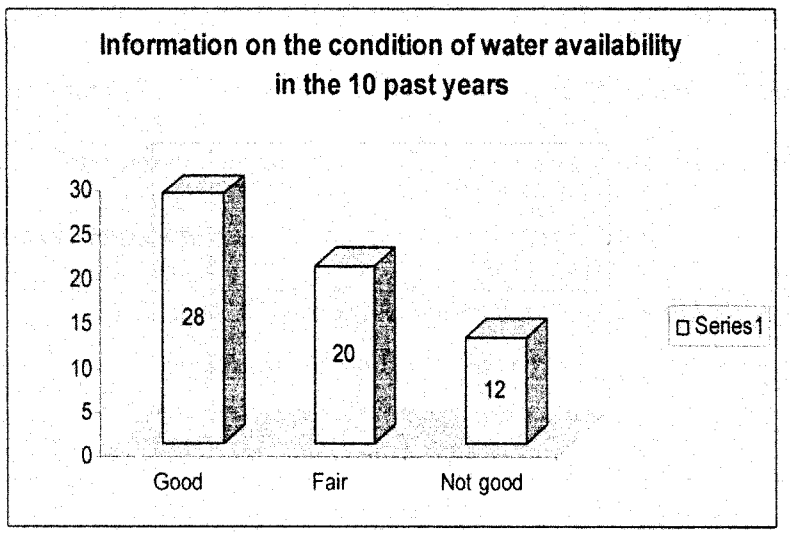


Source: Field Survey **2006**

Respondents were asked to give information on the condition of water availability and compare current condition with the 10 years past. The information obtained was that 68% of the respondents agree that the current condition of availability of water is not good while 25% said the condition is fair, 7% said the condition is good. On the other hand 28(49%) respondents agree that the condition of water availability in ten years past was good, 20(30%) said it was fare while 12(21%) respondents said the condition were not good. These indicate that good watershed management

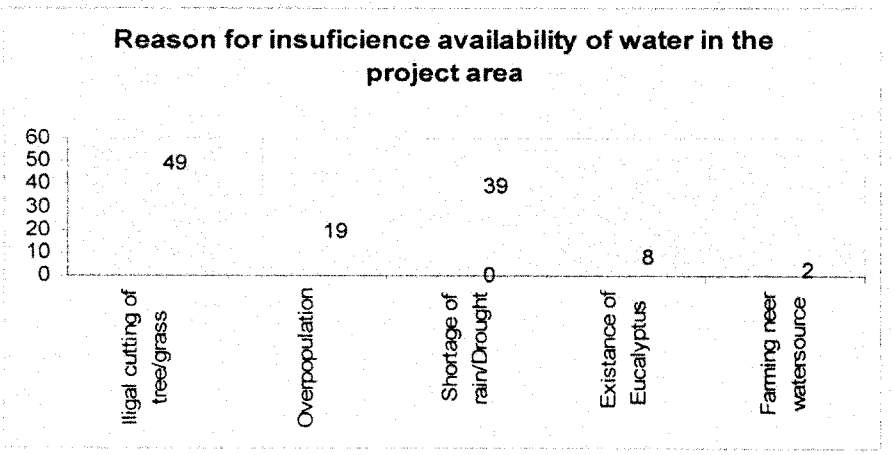
practice has a fundamental effect on the availability of water for community uses. Figure 8 and 9 gives detailed illustration on these specific points.

Fig 7.



Source: Field Survey **200**

Fig 8



Source: Field Survey **2006**

1.7.2. Information on the important measure to be undertaken so as to mitigate the problem of watershed management in the project area

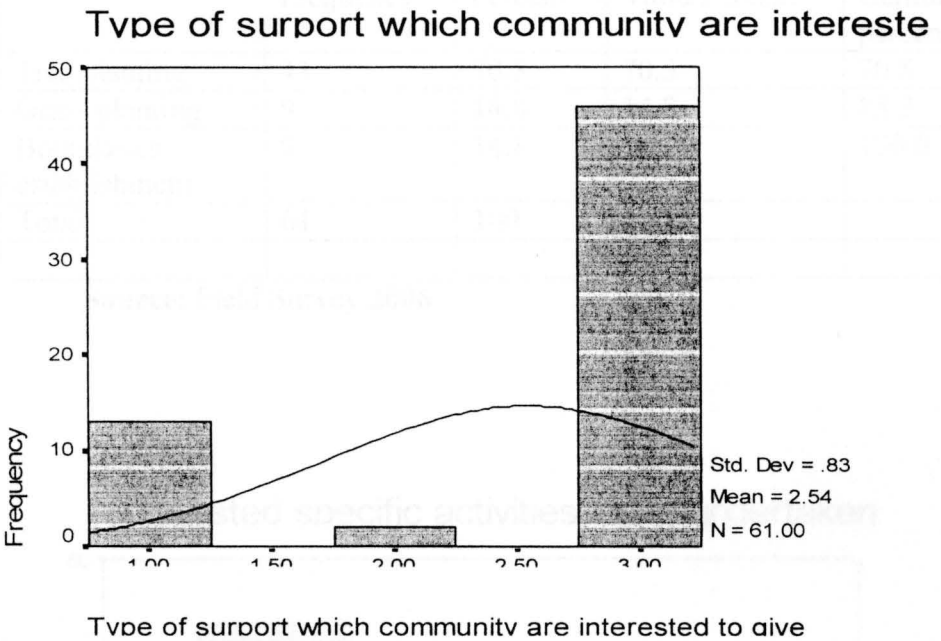
Figure 10 illustrate on the type of community contribution which respondents are ready to contribute in the implementation of watershed management project/programs. The result indicates that 75.4 respondents were interested on labour contribution. 21.3 were interested on just participation and 3.3 were interested in giving financial contribution. Figure 10 give more illustration.

Table 9. Type of support which community are interested to give

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Participate in project	13	21.3	21.3	21.3
	Financial support	2	3.3	3.3	24.6
	Labour Support	46	75.4	75.4	100
	Total	61	100	100	

Source: Field Survey **2006**

Fig 9.



Source: Field Survey **2006**

1.7.3 Information on important activities to be undertaken by the project.

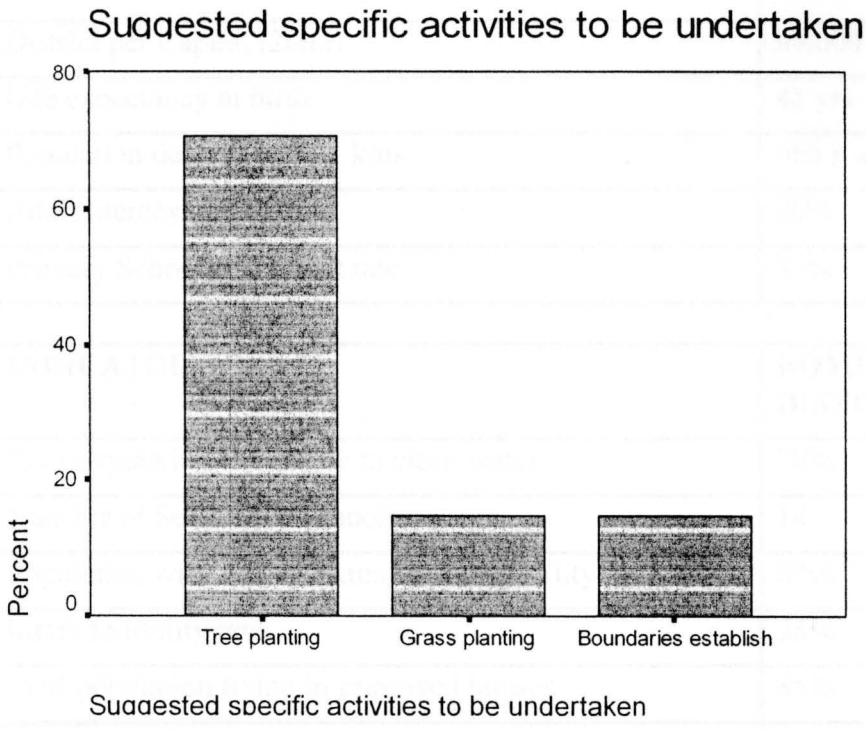
On ranking the important activities to be undertaken by the project, the data analyzed indicates Tree planting as the first activity, Planting grass as the second activity, Establishing permanent boundaries in watercourse area as the third Figure 13 illustrate more about these

Table 10. Suggested specific activities to be undertaken by the project.

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Tree planting	43	70.5	70.5	70.5
	Grass planting	9	14.8	14.8	85.2
	Boundaries establishment	9	14.8	14.8	100.0
	Total	61	100	100	

Source: Field Survey **2006**

Fig 10.



Suggested specific activities to be undertaken

Source: Field Survey **2006**

Table 11. Selected villages to implement watershed management project

		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Shimbimasho	20	32.8	32.8	32.8
	Mokala	20	32.8	32.8	65.6
	Maharo	21	34.4	34.4	100
	Total	61	100	100	

Source: Field Survey **2006**

Table 12. Selected social economic indicators in kelamfuamokala ward.

SN	INDICATOR	ROMBO DISTRICT
1	District per Capital (2006)	89,000 Tshs
2	Life expectancy at birth	45 yrs
3	Population density per Sq. kms	665 p square kms
4	Adult literacy rate	20%
5	Primary School enrolment rate	85%

SN	INDICATOR	ROMBO DISTRICT
6	% of population accessible to clean water	70%
7	Number of Secondary Schools	14
8	Population within 5 – 10 kms of heath facility	80%
9	Infant mortality rate	28%
10	% of population living in improved houses	85%
11	Population/Hospital ratio	1:61620
12	Population/Dispensary ratio	1:7720
13	Population/Rural Heath Canter ratio	1:61620
14	Maternal mortality	131

- **Source:** District planning office **2006**

1.7.4 Conclusions

i. From the data analysis, the results of the survey comply with the established objective of the survey. That is, Community need to have a good knowledge on the watershed management

ii. It is my hope that this research will play a big role on improving Integrated watershed management issues in Kelamfuamokala ward and other areas of water catchments forests in Mount Kilimanjaro

CHAPTER TWO

2.0 PROBLEM IDENTIFICATION

2.1 Introduction

This chapter aims at defining specific areas for targeted change; it consists of the essential social and economic data for the Kelamfuamokala ward in Rombo District and problem statement which resulted from community need assessments done

2.2 Socio-economic facts.

The shortage of firewood and other forest produce have created high pressure on the water catchments forest areas of Mount Kilimanjaro. Consequently this led into the high crisis of water for not only on upper village's areas, but also in the down stream areas. The main vision of Tanzania water policy of 2001 is to provide clean and safe water near community homestead at stated distance of 400 meters; in Kelamfuamokala ward there only only 57 percent of the population getting water at the stated distance. This calls the necessity for communities and other stakeholders to undertake a good management of watershed areas so as to increase the availability of water.

In 2004 more than 6532 families fail to settle their water bills of about 19,165,845.00 due to high increase of water cost per each unit, high raise of water bills was caused by taping water from far distance. Also the water demand for the whole district was 8,461,000m3 but the water supplied was 4,234,000m3, 50,040 families only was satisfactory in getting clean and safe water out of 121,112

families. Deforestation rate in the district which was found to be 19 ha per year was noted also to be one of the problem in watershed areas; the total forest cover area in the district is 38,194ha. Proper Integrated Watershed Management can be the only permanent and proper solution to this entire problem.

2.3 The problem statement

Poor land management practices in the upper watershed areas of Mount Kilimanjaro and its adjacent villages have contributed into environmental degradation including decreasing water quantity and quality in Rombo District.

2.4 Stakeholders of the project

The main stakeholders of the project includes Kelamfuamokala community, Development Investors Through Environment Conservation (DITEC),Kilimanjaro Environment Development Association (KEDA),Rombo District Council (RDC) and Roman Catholic Church .

2.5 The Project Objectives

2.5.1 The main objectives

The overall objectives of this project is to raise awareness of communities on the watershed management and conserving water source areas in Kelamfuamokala ward by the year 2010.

2.5.2 Specific/immediate objectives.

i. To involve local communities of three villages in the management of water sources located in their villages.

ii. Strengthening the efficiencies of water users groups in three villages, formulation of Villages Environment Committee and Watershed Management Teams for each watersource.

iii. Rehabilitating identified water source points by planting trees and installation of beacons at the water source boundaries.

iv. To assess the monitoring and evaluation of the project.

v. Insists on the use of organic pesticides (organic farming). The aim of this activity is to reduce water pollution which is caused by spraying inorganic chemicals to the agriculture crops.

2.6 Host Organization

The host organization of the project is Development Investors Through Environment Conservation (DITEC).The organization is currently working in three districts of Tanzania in the areas of environmental conservation and good governance.

My responsibilities in this project is to advise the organization management on the implementation of activities identified during the Community Needs assessment (CAN) on Integrated Watershed Management, also assists in conducting monitoring and evaluation of the project and compile a researched findings as part of my Msc.study.

CHAPTER THREE

3.0 LITERATURE REVIEW

3.1. INTRODUCTION

This chapter will cover three items namely Theoretical Literature, Empirical Literature and policy review. Theoretical Literature will deal with detailed findings from different reputable sources (e.g. Books,Proffessional journals and Reports) .These will give details focusing on social economical problems associated with inadequate of watershed management attitude within the community in the project area, in Tanzania and in other specified countries. Theoretical literature will also highlights on the measures undertaken by different communities and Nations to overcome the problem of watershed management. Empirical Literature will look on the existing situation and try to compare with other researches and project which have the same objectives carried within the region and in other Nations. Policy review will look on regional and national polices designed to provide a frame work to the project.

3.2 THEORETICAL LITERATURE REVIEW

3.2.1 DEFINITION OF THE WATERSHED MANAGEMENT PROCESS

Watershed Management is an iterative process of integrated decision-making regarding uses and modifications of lands and water within watershed areas (Donald, S.R 197). This process provides a chance for stakeholders to balance

diverse goals and uses for environmental resources. and to consider how their cumulative actions may affect long-term sustainability of these resources (Kowero, G.S. 1990). The Guiding Principles of the process are Partnerships, Geographic Focus and Sound Management.

Human modifications of lands and water directly alter delivery of water, sediments, and nutrients from the Earth ground. People have varying goals and values relative to uses of local land and water resources (Saleth, R.M 1999). Watershed management provides a framework for integrated decision-making, where we strive to; Assess the nature and status of the watershed ecosystem, define short-term and long-term goals for the system, determine objectives and actions needed to achieve selected goals, assess both benefits and costs of each action, implement desired actions, evaluate the effects actions and progress toward goals, and re-evaluate goals and objectives as part of an iterative process (Barrow, E.G. 1996). Watershed management is a rapidly evolving area in which engineering, resource management and social sciences are playing prominent roles

3.2.2 THE EFECT OF MISMANAGEMENT OF WATERSHED AREAS

The early part of this decade saw the increasingly stark reality of water shortage in rural and urban centers in Kilimanjaro region and other parties of the Tanzania country (Kulindwa, K. 2005). Since then, water shortage became another major concern added to the country's growing problems on environmental degradation. Consequently, a number of national initiatives came out to address these problems

(Emerton, L. and Bos, E.2004). As a form of ecosystem management, watershed management encompasses the entire watershed system, from uplands and headwaters, to floodplain wetlands and river channels, all these needs to be protected. It focuses on the processing of energy and materials (water, sediments, nutrients, and toxics) down slope through this system. Of principle concern is management of the basins and catchments forest water budget, which is the routing of precipitation through the pathways of evaporation, infiltration, and overland flow. This routing of groundwater and overland flow defines the delivery patterns to particular streams, lakes, and wetlands. The degradation of water resources and increasing water scarcity are thus major threats to the welfare of community in the country and specifically in Rombo Districts (Mwanga, A.E.2003). Given the gravity of the situation, Development Investors Through Environmental Conservation (DITEC), decided to embarks on project that facilitates sustainable water source management. Watershed management requires use of the social, ecological, and economic sciences (Khan, M.T .A 2005). Common goals for land and water resources must be developed among people of diverse social backgrounds and values. An understanding of the structure and function historical and current of the watershed system is required, so that the ecological effects of various alternative actions can be considered. The decision process also must weigh the economic benefits and costs of alternative actions, and blend current market dynamics with considerations of long-term sustainability of the ecosystem.

The overall objectives of this project are to raise awareness of communities on the watershed management and conserving water source areas of Mokala, Maharo and Shimbimasho Villages by the year 2010. As competition increases for limited natural resources, it is more important than ever to ensure that the best possible management, information and technology options are being implemented (Barrow, G.C 1996). Watershed projects play an increasingly important role in managing soil and water resources throughout the world.

3.2.3 EFFECT OF DEFORESTATION ON WATERSHED MANAGEMENT

Deforestation has been practiced by human for thousands of years. Fire was probably the first tool that allowed humans to modify the landscape. Fire was probably used to drive game into more accessible areas (Vudzijena, V.1998). With the advent of agriculture fire become the prime tool to clear land for crops. During the PRA exercise in the project area fire and livestock were mentioned as the most causes of deforestation in the watershed areas.

Deforestation is the conversion of forested areas to non-forest. Generally this involves the removal or destruction of significant areas of forest cover (Anderson, D.1986).deforestation is an important aspect of habitat destruction and is invariably accompanied by some degree of desiccation, the gradual reduction of water resources in a deforested region, desertification is an extreme result.

Deforestation (Whether deliberate or unintended) is the result of the removal of trees without sufficient reforestation. There are many causes, ranging from

extremely slow forest degradation to sudden and catastrophic wildfires (Munishi. P.K.T *et al* 2002)

Deforestation can be the result of the deliberate removal of forest cover for agriculture or urban development, or it can be an unintentional consequence of uncontrolled grazing (Which can prevent the natural regeneration of young trees).

Trees and plants in general, affect the hydrological cycle in a number of significant ways (Anderson, D.1986) these includes:

i. Their canopies intercept precipitation, some of which evaporates back to the atmosphere
ii. There litter, stems and trunks slow down runoff
iii. There roots create macrospores-large conduits - in the soil that increase infiltration
iv. They transport water from the soil to the atmosphere via transpiration
v. Their litter and organic residue change soil properties that affect the capacity of soil to store water

As a result, the presence or absence of trees can change the quality of water on the surface, in the soil or groundwater or in the atmosphere. This in turn changes erosion rates and the availability of water for either ecosystem function or human services.

Deforestation can also be defined in terms of land cover measurements, often use a percent of cover to determine deforestation (Janet, A.N.1998).This type of definition

has the advantage in that large areas can be easily measured, for example from satellite and photos.

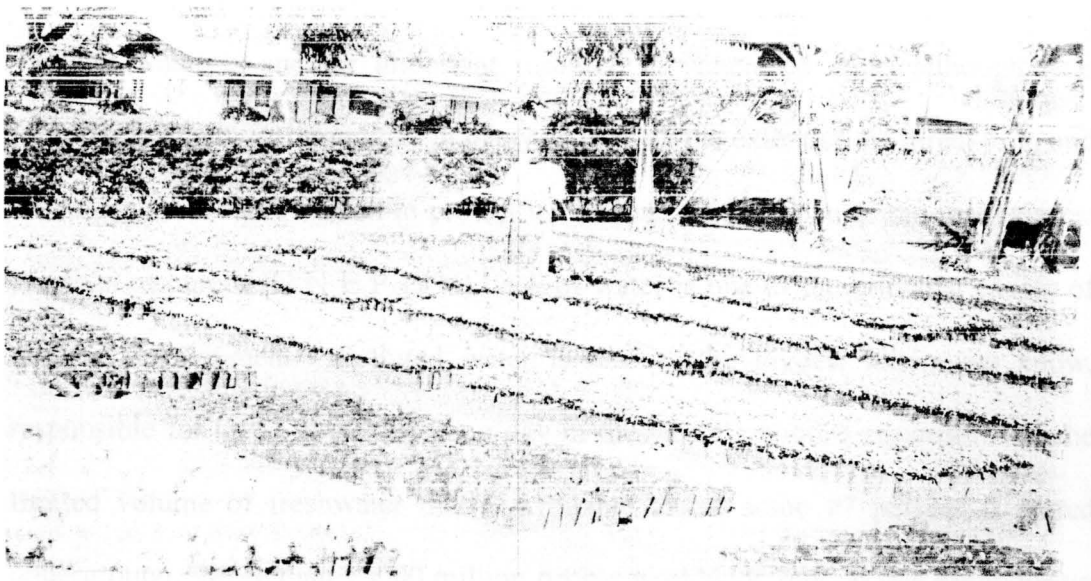


Fig 11. Huruma tree nursery in Rombo District **(2006)**. The tree seedlings were planted in degraded watershed areas.

3.2.4 GROUNDWATER FLOW RECHARGE

Groundwater enters the ground in recharge areas and leaves the ground at discharge points. Discharge is continuous, as long as sufficient water is present above the discharge point. Discharge points typically occur as seepage into wet-lands, lakes and streams. Springs are visible discharge points at the land surface. If the water table is close to the land surface during the growing season, large amounts of groundwater may be withdrawn by plant transpiration. One of watershed

Management Areas in Lake Challa Ground water recharges Point – In Rombo District is a good example of this specific point.

Ground water is another important resource in watershed areas although it is forgotten by many communities in many aspects on the extent of the threat to it, and the actions that can be taken to protect it. Ground water is one of the worlds most precious resources (U N E P 1996).Lack of water is one of the principal causes of delayed development. Polluted water is one of the biggest killers we know, responsible for up to 27000 deaths a day in the world's poorest countries. Of the limited volume of freshwater that is available to us, some 97 percent is stored underground. More than 15000 million people worldwide rely on this groundwater for their drinking water. Farmers all over the world use it to irrigate their crops. In arid areas, where rainfall is low or virtually non-existent, groundwater may be the only source of water for the human population (Bromley, D.W. 1992). As populations grow and their need for water increases, the pressures on our groundwater resources also increase. In many areas of the world, groundwater is now being over-abstracted. The result is falling water levels and declining well yields, more expensive supplies, land subsidence, the instruction of salt water into freshwater supplies and ecological damage such as the drying out of wetlands (Donald, S.R 1972). Groundwater is also being polluted. Lake Challa,a ground water recharge point is located in surveyed area. This is one of the areas where seriously watershed management practices need to be implemented.

In many countries the existence of groundwater can be determined through ground water flow models, the system are used to calculate the rate and direction of movement of groundwater through aquifers and confining units in the subsurface (Doody K. and Mesak, s 2003). These calculations are referred to as simulations. The simulation of groundwater flow requires a thorough understanding of the hydro geologic characteristics of the site which are very important factors on installation of integrated watershed management schemes. The hydro geologic investigation should include a complete characterization of the following (Doody K. and Mesak, s 2003):

i. Subsurface extent and thickness of aquifers and confining units (hydro geologic framework),
ii. Hydrologic boundaries (also referred to as boundary conditions), which control the rate and direction of movement of groundwater,
iii. A description of the horizontal and vertical distribution of hydraulic head throughout the modeled area for both beginning (initial conditions), equilibrium (steady-state conditions) and transitional conditions when hydraulic head may vary with time (transient conditions), and
iv. Distribution and magnitude of groundwater recharge, pumping or injection of groundwater, leakage to or from surface-water bodies, etc. (sources or sinks, also referred to as stresses). These stresses may be constant (unvarying with time) or may change with time (transient).

The outputs from the model simulations are the hydraulic heads and groundwater flow rates which are in equilibrium with the hydrogeology conditions (hydrogeology framework, hydrologic boundaries, initial and transient conditions, hydraulic properties, and sources or sinks) defined for the modeled area(McKean M.A 1996)

3.3 EMPIRICAL LITERATURE

The empirical review will look at the description of existing situation at Mokala, Maharo and Shimbimasho villages in Kelamfuamokala ward and give an insight description of the community also few watershed projects identified in the region and national wide were discussed and compare the approaches with this project.

3.3.1 LOCAL COMMUNITIES PARTICIPATION IN WATERSHED MANAGEMENT

Participation of the local population in decisions on land use is of fore most important, and it is given the high priority in almost all activities of this project in order to respond to existing needs and preferences of the population these had to be known first. The approach of this project will encompassed the establishment of watershed management team which will be under Villages Environmental Committee; Watershed Management Area Teams are being created to enhance Ecology's focus on water quality, water quantity, and rehabilitation of water source areas (Keddy, P.A 1999). The Teams will develop and carry out work plans that

address the priority actions in collaborated with the District land Natural Resources and Environment Department. The Team will serve as a two-way information conduit for Ecology programs, form partnerships to complete assigned tasks and coordinate activities; the foremost function of the team will contain a planning on:

i. Assessment of nature and status of watershed ecosystem
ii. Definition of short-term goals
iii. Definition of long-term goals
iv. Determine actions for short-term goals
v. Determine actions for long-term goals
vi. Assess costs and benefits Commitments to implement
vii. Method for evaluating progress

Through this approach the project will carry five main activities which are; Establishment of tree nurseries, Training of communities on the use of organic pesticides for agriculture crops (Organic farming),Conservation of seven water source areas which will be done by protecting the area from encroachment and planting of suitable trees and grasses species, Environmental extension activities to the communities through all three villages and Development and establishment of participatory land use plan in the project area.

Integrating activities for conservation and development through people's participation and collaboration among different institutional and social actors is being increasingly recognized as the most promising approach to sustainable natural

resource management (Mgeni A.S.1992). Participation is an essential part of human growth that is the development of self – confidence, pride, initiative, creativity, responsibility and cooperation. Without such a development within the people themselves all effort to alleviate their poverty will be immensely more difficult. if not impossible (Kajembe, G.C 1994). This process where people learn to take charge of their own lives and to solve their own problems is the real essence of development.

3.3.2 THE APPROACHES OF OTHER WATERSHED MANAGEMENT PROJECTS

In the Tanzania Eastern Arc Forest Conservation and Management Project (GEF 2006), the project has been classified as Category B with respect to its expected environmental and social impacts on watershed areas restorations. The project supports the implementation of a series of participatory forestry and watershed management activities. Provisions is made to bring about sound forest management, and when required, the preservation of critical biodiversity habitats. In particular, areas classified as catchments forest that are important for watershed protection and the Eastern Arc Montanan Forest it is targeted for priority protection and conservation environmental risks are associated with well known and documented forest management constraints encroachment into forest reserves, difficulties in implementing practical sustainable forest management plans and sometimes ineffective traditional government forest management policies and regulatory

measures. Social and economic impacts have been assessed for all plantation forests which are expected to be directly affected by the component involving the private sector in managing industrial forest plantations.

In Newala District protected forest areas covers most of the Makonde Plateu. a raised area inland of Mtwara District and south of the Rondo Plateau to the south in Mozambique plateau (Bruce A.B. 2004). The Makonde Scarp reserves was created to protect a vital watershed and as an erosion control measure for the southern highway. Anyone who has witnessed the effects of the devastating floods of 1991 can be in no doubt of the. Necessity of flood prevention. On the plateau south of the escarpment much of the land was abandoned cashew nut plantation. The escarpment was not being cultivated due to a shortage of land, simply because available land was poorly utilized.

The proposed creation of a southern economic corridor necessitances an even higher degree of protection for the Makonde plateau and especially its northern facing escarpment. As a prerequisite for any conservation measures the integrity of the Makonde Scrape reserves must be maintained.

The Mkunya River reserves were designed to protect the southern escarpment above the Ruvuma River, it appeared that this forest was under threat from agricultural encroachment and extensive use along much of its considerable length also Duru Haitemba and Mgori Forests in Babati and Singida Districts which are under the SIDA supported LAMP project are good example of watershed management project which were highly succeeded in Tanzania.

The Phu Wiang catchment in the rolling landscape of northeast Thailand looks like the remnants of an ancient volcano. Until recently the natural protection offered by the geology of the valley kept it virtually isolated from the outside world. In fact, according to legend the valley often provided shelter to people seeking to escape the hardships of the wars that have historically ravaged the area. The present inhabitants consider themselves to be direct descendants from these earlier settlers after well protected measure against deforestation through the involvement of surrounding communities.

In Madagascar, a generalized Vignette, the area around a large nature reserve, an area exceptionally rich in species and diverse habitats were conserved through the launching of integrated conservation and development project (ICDP 2002). Project managers in this hypothetical ICDP wanted people form poor villagers in the buffer zone of nature reserve to stop grazing cattle in the reserve, cutting threes for charcoal production, and practicing slash and burn cultivation of cassava in the area's forests. They assumed that economic motivations were primary, and therefore tried to develop alternative sources of food and income as substitutes for what they believed to be unsustainable practices. Project activities focused on increasing irrigated rice production in the buffer zone and improving roads to make transportation to local markets easier. An environmental education campaign was also carried out. These interventions had some success, but also a number of puzzling and disturbing failures. The environmental education campaign was clearly successful, everyone, even young children, could explain the value of forests in

watershed protection and irrigation. Because of better water management, rice production hand increased. And using the improved road, the villagers were transporting more rice than ever before to local markets.

Models of the process used to plan, implement, and evaluate activities for influencing conservation behaviors have been developed by a number of practitioners (Dietz *et all*, 1995). These models have many elements in common; most include an initial assessment, research, or problem-definition stage; a design or planning stage; an implementation stage; and monitoring and evaluation components.

The Golden Lion Tamarin Project in Brazil, which aims to conserve this Brazilian monkey and its habitat, is another example of a successful process for understanding and influencing conservation behavior (Dietz et all, 1994). Goals of the project were to slow or stop the destruction of the lowland Atlantic Forest habitat to the golden lion Tamarin and to stop the hunting of tamarinds and their capture for the pet trade. The assessment and research stage of this project consisted of informal interviews with local community leaders and use of a questionnaire-based survey of knowledge and opinion. This research provided information about some of the Project activities were mainly of an educational nature, designed to influence awareness and knowledge, attitudes, and values

Local Environmental Protection Program (LEPP) continues to emphasize the importance of watershed and clean water programs, to be developed and administered by community (Mwanga,.A.E 2003), county water and environmental

departments and other local authorities. Development of a watershed management system is an important first step in addressing the overall water quality needs of a community (Barrow G.C 1996).Arguments for community based watershed management are drawn from several disciplines. Some views are derived from biologist and conservationists, while others are drawn from the indigenous peoples and human right movements. On this argument the success of the protected water catchments areas depend very much on degree of support and respect awarded to the protected forest by the local communities.Indiginous knowledge based argument proclaims that local communities have extensive knowledge for enhancing and promoting biodiversity in many water sources areas (Kajembe, 1999).This project will incorporate those successful approach which were followed by other project.

3.4 THE POLICY LITERATURE REVIEW

Watershed management issues are cross – sectoral, this number of sectoral policies are relevant in watershed management in relation to poverty reduction. These policies include The National Environment Policy (1997), The National Water Policy (2002), the national Land Policy (1995), The village Land Act. 1999, The national Forest Policy (1998), The Agriculture and Livestock Policy and the Regional Secretariats Operation Manuals (1999). Other policies have indirect bearing on watershed management. These includes the National Policy for Youth development (1996), Gender and Development policy (1996), the national Human Settlements Development policy (1996) and the Tanzania poverty Reduction Strategy – Poverty reduction Support Credit – PRSC (2003).

3.4.1. INADEQUATE EDUCATION AND AWARENES ON WATERSHED MANAGEMENT ISSUES AND WATERSHED VALUES.

The Majority of the Tanzania Communities have relatively title knowledge on watershed management, their values and the need for their conservation (MWLD 2002). Watershed has been and to some is steel as " God given Resources" that need no special management. Raising public awareness is therefore one way of ensuring. Sustainable watershed Resource Management. In this respect, it is necessary that awareness is created on all aspects of the status and management of watershed at all levels (Barrow, E.G.C. 1996). This activity could include the gathering of knowledge on how different stakeholders play a role in the degradation and well being of watersheds. Different means of information dissemination should be considered, of course taking into confederation their effectiveness (Anderson, J.E.C. and Ngazi , Z. 19995). Issues related to new policy developments and changes in resources administration and regulations are necessary to ensure that each stakeholder is informed to changes arising from their actions toward watershed management (MNRT 19990). Awareness creation should seek to motivate people to appreciate the values of watershed and convey appropriate messages to help mainstream wise use principle in watershed management. In watershed management two - way – communication should be effected across different sectors and between government and other stakeholders and vice versa. The ultimate goals of awareness creation should be to increase the number of advocates and networks.

The forest policy which is also encompasses in this project has been used in Tanzania till recently was formulated in 1953 and amended in 1998. This policy, formulated during the colonial era (when Tanganyika was under British Administration), clearly it was outdated. The new forest policy and Natural Resources and Environmental policy which calls for collaboration between Governments, Local community, Environmental Institutions and religions(MNRT 1999); in outline more efforts on protecting the existing water catchments forest and other natural resources will be essential components in the implementation of this project. The policy also requires improving and strengthening the relationship between the environmental related sectors. During the last decade, the forest sector in Tanzania has gone through fundamental changes in terms of policy, strategies, and institutional arrangements (Bagachwa, M.S.D 1992). Generally, these changes allow for a much greater role of non-state actors in the management of Tanzania's forest estate, and in particular community-based approaches to securing and managing forests. These approaches generally referred to as Participatory Forest Management (PFM), have become a central strategy of the Forestry and Beekeeping Division to ensure the sustainable management and conservation of Tanzania's forests. Participatory Forest Management (PFM) occurs in two basic forms and encompasses Joint Forest Management (JFM) – where communities enter into agreements with central or local governments over the Joint (or shared) management of forest resources, and Community Based Forest Management (CBFM), which recognizes local property rights and ownership over forests in

village land and transfers Management authority to village government(Kajembe,G.C 1994). Until recently, these approaches have been largely implemented through a diverse range of donor supported projects working at the local level. Increased focus by donors in supporting national and local government institutions, through direct grants, and potentially also basket funding approaches, is leading to a process that is increasingly mainstreamed through government institutions, and co-ordinated as part of the wider National Forest Programme (NFP). Participatory Forest Management has been established across large parts of Tanzania through a range of door funded, site based projects.

This project also support water policy which has the main objective of providing clean and safe water nearer Community homestead at stated distance of 400 meters and to involves all communities, Stakeholders and donors to take part on; Educating the communities on the importance of protecting environments at water catchments areas and ensuring fully involvements of communities in provision of water services at all levels, including operation and maintenances of water schemes by establishing Water Committees, together with reviving village water funds(MWLD 20020).

It can be noted that while the Tanzanian government and international agencies have overestimated their own capabilities for forest management, they have underestimated the value of local governance over those resources (Bromley, 199 ?). Local communities who depend on forests for many commodities and services not just timber, are more sensitive to their protective functions and the wide variety of goods available from them in sustainable harvest. But when the governments

overrule traditional use rights to forests, local communities and individual households are unable, and less willing to prevent destructive encroachment or overexploitation

Major political changes in Tanzania since the last forest policy was formulated in 1953 are: Political independence in 1961,The Arusha Declaration of 1967, which set the country on a socialist oriented development, The decentralization of government administration in 1972,The villagization program of 1967 to 1976,The economic recovery program (ERP) of 1986,

Among them were the passage of National Water Crisis Act and the signing of Executive Order No. 222 both of which were meant of basically to address the increasing problems on water supply.

3.4.2 INTERGRATED RIVER BASIN MANAGEMENT

The subject of river basin management has been associated historically with the main cultures and Civilizations which have evolved and sometimes disappeared to the availability of water (Kenneth *at al* 2001). Villagers, who make up most of the population in many countries, have gradually been losing sight of this dependence on water and watercourses, to such a point that they have come to ignore issues of river basin completely because they always have ample water at their disposal all the time, Management at the river basin level has made a great problem in many region including Rombo District, but despite these there is still no consensus on definitions that spell out the objectives of that management (Mwanga A.E 2003).

Setting up any kind of river basin organization, with a view to river basin management under any of its modalities, entails a series of ongoing processes that can be implemented in parallel (Young, R 1986). The

Processes that are particularly worthy of further analysis are:

i. Communication and awareness raising
ii. Formation of alliances and agreements
iii. Legalizations of operations
iv. Scenario development, evaluation and diagnosis
v. Operational consolidation of each water user
vi. Administrative organization
vii. Economic valuation and preparation of strategies
viii. Operation of the shared hydraulic system
ix. Conservation of bodies of water, natural habitats and biodiversity; and
x. Water pollution control, stream corridor restoration and recovery of rural and urban drainage capacity.

These processes can be divided into three groups: a central co-ordination process, a group of socio-economic processes, and a group of physical and technical processes. The lack of conceptual clarity on the subject impairs the exchange of ideas and experiences, particularly between professionals and different groups , causes overlapping of functions and hinders the formulation of policies and laws on the subject. Inconsistencies in the use and meaning of many of the terms relating to river basin management suggest the convenience of defining and classifying such

concepts. Watershed management has become a sub-item or part of this integrated approach to natural elements and natural resource management (Gelt, J.1998). The traditional approach to watershed management aimed at regulating the run-off of water is part of the approach to natural resource management. The management of a river basin relies on the conjunction of two groups of complementary actions; One group of actions directed towards developing the natural resources (using, converting and Consuming them) present in the river basin in order to boost economic growth, and a second group of actions directed towards managing them (conserving, reclaiming and protecting them) with the aim of ultimately ensuring environmental sustainability. It might be added that these two groups of actions must be performed with the participation of the actors, whether inhabitants or other parties having an interest in the river basin, with a view to seeking equity.

This is considered to be implicit in the process of integrated management; Integrated management of river basins for the purposes of human development = Development of (the natural resources) river basins for the Purposes of economic growth + management of (the natural resources) river basins for the Purposes of environmental sustainability (James, S. 2000). Actions involved in both the development and management of a river basin can also be divided into two groups:

i. Group of technical or direct actions, also known as structural actions or measures (studies, projects, works, operation, management); and

ii. Group of management or indirect actions, also known as non-structural measures (financing, standard-setting, organization). In other words, this

new approach to watershed management pursues social, economic and environmental objectives for the benefit of all who have a stake in the watershed, in addition to managing it as a catchments area of water for multiple uses. A tentative list of technical actions normally considered in watershed management programmes in Latin

3.4.3 RELATION BETWEEN WATERSHED MANAGEMENT AND RIVER BASIN MANAGEMENT

Watershed management is a mixed activity (Dourojeanni, A 1996), linked to management and conservation of all natural elements and resources as well as water management itself. It can be oriented towards integrated water resources management or towards sectoral water management (Kenneth *at al* 2001). Sectoral management is the only known level of river basin management in the region and it is at this level that most of the studies and investments in hydroelectricity, irrigation and drainage, drinking water supply and flood control are conducted. Some steps towards integrated water resources management have been taken but more in theory than in practice. A classic definition of watershed management is that it is "the art and science of managing the natural resources of a watershed in order to control the discharge of the water in terms of quality, quantity, location and time of occurrence". This definition is well-suited for the Rocky Mountains in the United States, where relatively small sparsely inhabited watersheds are mainly used for the catchments of water for urban and agricultural purposes. It derives from the forestry schools owing to the fact that these watersheds are mainly used for the purposes of

forestry and pastureland (Agenda 21 – 1996). Originally, therefore, the term was used in the realm of hydrology and forestry, and some very well-known experimental watershed management programmes were established in the mountains areas.

This original definition of watershed management applied then, first and foremost, to sparsely inhabited watersheds whose main purpose was to capture water for community use or for other uses. It is important to note that the definition of watershed management is also being re–evaluated where in the past decade; the number of watershed-based groups and initiatives has increased dramatically, along with the use of a watershed framework for addressing natural resources and environmental management problems. Key to these developments is the emergence of the "new watershed approach." Distinguishing features of this new approach are decentralized and shared decision making, collaboration, engagement of a wide array of stakeholders (including non–governmental interests), and goals evidencing concern for ecosystems protection. This new approach differs from the traditional one that is more fragmented and reliant upon centralized agency decision–making and command–and–control strategies (Leigh, M 1993).

For a number of reasons, watersheds provide an appropriate framework for managing natural resources. The most obvious reason is that watersheds are naturally defined surface areas and provide a focus for observing the effects of human activities on land and water. Managing a watershed often means managing human activities to lessen any damaging effects on natural processes. At the same

time, an acceptance of watersheds as managing units implies less reliance on bureaucratic techniques; instead, the workings of a watershed determine what decisions are made and what actions are taken.

3.4.4 DECISION MAKING POWERS OF COMMUNITIES IN PRACTICE

Throughout its course, the watershed project's main objective in Mokala, Maharo and Shimbimasho was, and still is, to identify and field-test methods and techniques for promoting and consolidating people's participation in the sustainable management of upland watersheds. Its immediate objectives were to:

i. Start-up and consolidate a pilot scheme for participatory and integrated watershed management in each of the selected village.

ii. Incorporate the participatory and integrated watershed management approach into national policies for Community Economic Development in rural areas and natural resource conservation, and into decentralized planning systems.

Tanzania (total area: 945,000 square kilometers) is divided into 22 regions, led by regional commissioners. Regions are divided into districts under the political leadership of district commissioners. The head of the Civil Service at the district level is the District Executive Director who works under the district council, which is composed of elected district councilors. The district is subdivided into divisions and each division is subdivided into wards administered by a ward executive secretary. The wards are composed of villages that have a government employee a

village executive secretary, who works with the guidance of the elected village government and chairman. The village executive officers are the local development agents, working with the strong support of the ward executive secretary.

In terms of resource and watershed management management, districts and lower organs are required to set up environmental committees (unlike in Uganda, where the environmental law to give teeth to such committees has yet to be finalized). Village environmental committees, and under them resource user groups, are instrumental in resource management.

Uganda's Environmental Management Statute of 1995 provided for Environmental Committees with a specialist environmental officer assigned to the district (UFD 2000). Uganda now has a strongly decentralized model of governance, although control of major forests continues to be vested in national authorities. The sub-county (LC3) is the lowest level of service delivery (i.e., there are extension officers); the parish and village (LC2 and LC1, respectively) levels deal with local community issues.

Arguments for community based watershed management are drawn from several disciplines. Some views are derived from biologist and conservationists, while others are drawn from the indigenous peoples and human right movements (Ribot, J 1999). On this argument the success of the protected water catchments areas depend very much on degree of support and respect awarded to the protected watershed areas by the local communities.Indiginous knowledge based argument proclaims

that local communities have extensive knowledge for enhancing and promoting biodiversity in many water sources areas (Vabi,M.1999).

CHAPTER FOUR

4.0 PROJECT IMPLIMENTATION

4.1 INTRODUCTION:

This chapter gives a detailed explanation of planned and actual implementation of the project. It explains the original plan of the project, the implementation process; output and products as well as inputs and it report what was accomplished.

5.2 Product and Outputs

Up to August 2007 the project was able to accomplish 92% of the activities which were planned to end in 2007.Among the activities accomplished includes:

Products

- Established Villages Environmental Committees with knowledge and skills on Integrated Watershed Management Practices
- Established Watershed management Teams (WMT) to each watersource area
- Five year strategic plan of the DITEC organization
- Installed monitoring and Evaluation system
- Availability of fuel wood, fodder, timber and building poles for the communities
- Good practice of watershed management areas.
- Conservation of water catchments forest hence increase availability of water quantity and quality in the streams for the communities use
- Poverty reduction aspect in the project areas.

Outputs

- Rehabilitated of 11 watersource areas
- Establishment of 7 private tree nurseries
- Total number of 13,245 tree seedlings were raised
- 13 Villages extension meeting were conducted
- Participatory land use plan for one village was developed
- Establishment of 11 Watershed Management Team in 3 villages

4.3 Project Planning and implementation

In implementing Integrated Watershed Management Project we need to improve land use diversification and creating a new opportunity to improve nature and life of the community timely and thoughtfully. The project has used the integrated conservation approach method to facilitate its activities. The specific activities of the project were as follows:

4.3.1. The Tree nurseries establishment:

To produce 15,000 suitable tree species for the various conservation purposes

To assist 30 individuals and 3 primary schools in establishing their own tree nurseries

5.3.2 Water Catchments/forest Reserves:

Rehabilitation of 11 water source areas in half mile forest strip by planting suitable tree species. This were done by involving local communities surrounding the the areas

4.3.3 Extension services:

Technician from forestry, community development and Agricultural departments were used for delivering extension packages to the farmers. Participatory Rural Appraisal (PRA) was the main extension approach used. PRA was recommended because it involves community forum for discussion and it can impose local solutions to local identified problems. Selected 3 primary schools in the targeted area were involved in this project, namely Mokala, Maharo and Shimbimasho primary schools.

4.3.4 Administration of the project:

Practiced day to day administrative activities of the project which includes report writing, meetings and budget controls:

4.4 Financial support:

DITEC, Community contribution, Rombo District Council and George Fisher Foundation - Switzerland were the main financial agency for supporting of this project in its initial stage.

4.5 The Project Phases:

The project pilot phase duration will take two years that is from January 2006 to December 2007.

4.6 Involvement of local community:

Local community was involved in the following areas;

- Raising tree seedlings and participate in tree planting both in the half mile watershed areas and in their home gardens;
- Tend and cares the planted trees
- To participate in the PRA exercise and workshops
- The estimated local community contribution in this project is 7,000,000 this will be secured through labour contribution.

4.7 Vision of DITEC organization

To be good and sound Organization with good governance approach that will change the life of the community through practicing good environmental management.

4.8 Mission statement of DITEC organization

To work closely with community on delivering and practicing agreed technology of environmental management

4.9 Project description:

Rombo District embarked on improving its forest since 1995 through different forest programs including agro forest and environmental conservation approach. Initially these programs were prepared to cope with Tanzania Forest Action Plan [TFAP]. The TFAP was aimed at reviewing the past effort, formulating long term development strategies, preparing project profiles and establishing targets. Its now very unfortunately that many programs established in Rombo District have phased out and therefore the effect of deforestation and soil erosion is now at high level

without any prior way of restoration. DITEC prepared this project which includes actions and measures to be addressed to Integrated Watershed Management issues to support the district effort. The action had the following components:-

i. Capacity building to the extensions and local communities in conservation and Environmental management activities

ii. Establishing of tree nurseries which tree seedlings were used in rehabilitating water source areas and establishing of private woodlots and farm forests

iii. Training at villages and wards levels through meetings, seminars, local visits exchange and farmers Field Schools (FFS) programs

iv. Provision of inputs, e.g. tree nurseries equipment and materials.

4.10 Budget

Table 13.**Budget - Executive summary**

SN	ACTIVITIES	BUDGETED COSTS
1	Tree nurseries	1,193,000.00
2	Rehabilitation of watersource areas	1,200,000.00
3	On farm tree nurseries	2,290,000.00
4	Administration	3,000,000.00
5	Contingency 25%	1,920,750.00
	GRAND TOTAL	**9,603,750.00**

Table 14.**Budget – Detailed explanation**

Tree nurseries

SN	ACTIVITIES	BUDGETED COSTS
1	Tree seed procurement (10 kg x Tsh18,000.00)	18,000.00
2	Polythene tubes procurement (200 kg x Tsh 3000.00)	600,000.00
3	Wheelbarrow (4 x Tsh 70,000.00)	280,000.00
5	Sieving wire (10m xTsh 5000.00)	50,000.00
6	Pruning knives (10 x Tsh 2000.00)	20,000.00

7	Watering canes (15 x Tsh 7000.00)	105,000.00
10	Fuel (100Lts x Tsh1200.00)	120,000.00
	Sub Total	**1,193,000.00**

Planting of tree in watersource area

SN	ACTIVITIES	BUDGETED COSTS
2	Fuel for transporting seedlings (1000 x Tsh 1200.00)	1,200,000.00
	Sub Total	**1,200,000.00**

On farm forestry/Agro forestry and land use plan

SN	ACTIVITIES	BUDGETED COSTS
1	Farmers exchange(4 x 3villages x 1 days xTsh15,000.00)	180,000.00
2	Staff allowances (2 x 1 days 3 Villages x 30,000.00)	180,000.00
2	Alignment of contour bands (Staff 2 x 4 days x 3 villages x Tsh 15,000.00)	360,000.00
3	Procurement of spirit level (30 spirit level x Tsh 9000.00)	270,000.00
4	Procurement of manila twines 1000m	40,000.00
5	Seminars in 3 villages (15 farmers x 3 villages x Tsh 4000.00)	180,000.00
6	Facilitators 3 x 3 Villages x Tsh 20,000.00)	180,000.00
	Fuel (400lts x Tsh 1200.00)	480,000.00
7	Land use plan in 3 villages (staff 2 x 5days x 3 villages x 20,000.00)	600,000.00
	Sub Total	**2,290,000.00**

Administration

SN	ACTIVITIES	BUDGETED COSTS
1	DITEC Management Meeting	500,000.00
	Stationeries	1,300,000.00
2	Fuel (1200 lts x Tsh 1000.00)	1,200,000.00
	Sub Total	**3,000,000.00**
	Grand Total	**7,683,000.00**
	Contingency 25%	**1,920,750.00**
	Grand Total	**9,603,750.00**

CHAPTER FIVE

5.0 MONITORING, EVALUATION AND SUSTAINABILITY

5.1 Introduction

Monitoring, Evaluation and sustainability are important pillars in project design and management. Each process has a significant value to the community and to the entire success plan of the project.

5.2 Project Monitoring

Monitoring compare progress of activities with the original plan and keeping project activities on schedule, other analysed situation includes revise future goals,making decisions about human, financial and material resources and it also help in identifying problems and finding solution.

5.2.1 Monitoring Methodology

DITEC, Community in the villages and Department of land Natural Resources and Environment {LNRE}in Rombo District Council effected a close monitoring of all activities performed by the project .These were done through assessments forms, visit and involvement of local community at all stages of the project. All reports were submitted to DITEC secretariat and it was well discussed by the DITEC members and the villagers. The monitoring process was based on participatory process and helped very much towards success of the project.

5.2.3 Basic Tools used in Monitoring

i. Interviews to the Watershed management teams, Villages Environmental committees and village leaders

ii. Monthly reports from the villages. reports of the organization Executive Committees and Financial reports

iii. Many areas of the project activities were visited.

iv. Checking of the effectiveness of following time frame activities of the project.

5.2.4 Monitoring Plan

Monitoring is usually a continuous process and it normally takes place right from the introduction of the idea of the project. In this project monitoring started right at the start of planning of the project .This is indicated in appendix.....

Table 15.MONITORING CHECKLIST

Sn.	Focal Areas	Monitoring Indicators used	Monitoring results.
1	Organization management	I. Way of making decision democratically and follow up of the timetable for meeting and availability of the minutes	23 Project management meeting, 32 Village Environmental Meeting, 27 Villages Executive Committee meeting and 15 Villages assemblies were carried for assurance of democratic decisions. Timetable was followed and the minutes were available. Average of members attendance was 78%
		ii.Capacity of sharing task within the organization staff, members and the community.	High collaboration and experience sharing between staff, members and community were observed.
2	Social impact and	I. Active participation in the community task	17% of the project activities implemented through

	community participation.		community labour contributions.
3.	Economic impact	I. Type house construction in household	97% of the house is permanent and good house
4	Environmental impact	I. Number of water source rehabilitated ii.Number of trees planted iii.Environmental training manuals established and followed iv.Existence of proper Environmental committee and watershed management teams in the villagers v.Established participatory land use management plan and well practiced	11 Watersource rehabilitated by community. Total number of tree seedlings raised and planted was 13,245. 4 environmental training manuals established where 1455 leaflets were distributed. 3 Villages Environmental Committee and 11 Watershed Management teams were established and empowered on the watershed skills. Established one manual for participatory Land use Management Plan in Mokala Village.
5	Linkage with other stakeholders	I. Contact and linkages made with other stakeholders working within the same objectives in the area.	There good cooperation and linkages with KEDA, TECOSSO, Huruma Convert and Roman Catholic church.
7	Management of funds	I. Bank accounts details and financial reporting procedure	9,603,750.00 shillings used to implement the budgeted activities of the project. The project operated under NMB accounts.8 reports of financial expenditure were submitted at the Organization Executive committee and to the two General assembly.

5.3 Project Evaluation

Evaluation is the periodic assessments of the project and it review the extent to which medium and long term objectives of a program or project have been implemented and its entire achievement. Evaluation also is a systematic examination of the project to determine its relevance, effectiveness, impact or benefit to targeted population. The implementation of this project were done under two types of evaluation namely,

- Inbuilt or formative evaluation which was done as the implementation proceed and
- Terminal or sumative evaluation which was done at the end of second year of the project in July 2007.

All these processes were done in participatory manner. Participatory evaluation helps to revise the objectives and implementation of the plan, it helps to revise budget and it explores the weaknesses and suggests correcting measurers.

5.3.1 Methodology of evaluation.

The evaluation team was planned the evaluation process as follows;

- Visits and interviews of a sample of beneficiaries and
- Interviews with project staff to verify output and outcomes and to understand the internal functioning of the project.
- Interviewed third opinion of people standing outside of the project to confirm collected information

- The evaluation team used semi structured interviews to get information about outputs and outcomes of the project and structured interviews to understand the internal functioning of the project

5.3.2 The tools and Technique used for Evaluation.

i. Reviewed of project objective and look the project performance
ii. Consider the mid – term review and capacity building process
iii. Interviews to the target group and stakeholders in relation to their views
iv. Increased ownership of the results of the evaluation by the integration of institutional stakeholders at all moments of the evaluation exercise
v. Ensuring ownership by the target group

5.3.2 Choice of project site to be visited

Based of project description, the evaluation team asked the project coordinator Mr. Joseph Chezue to prepare a programme, including visits in three communities, three primary schools and interviews with environmental committee and watershed management teams. The choice of project sites has been made by project staff based on the request of the evaluation team and considering the limited time.

An overall assessment of the project achievements and the response of beneficiaries on the questionnaires and during the interviews was demonstrated the relevancy and the appreciation of the intervention of the project by the community. The staff of DITEC and all members are well known in the area. Especially the fact that women

have an increased access to more knowledge and information on different topics (Watershed management, environment and aforestation) through training and exchange is highly appreciated. The focus of the project was on the raising of awareness on watershed management skills and practicing of participatory land use plan in the area.

A lot of emphasis has been put on the execution of activities. Where it considers the analysis and the feasibility studies in identified points regarding the issue of water source protection, however it was taken as the planning document and all activities proposed were executed as presented in the project proposal.

The Project Advisory Committee has to invest in trust building between the parties involved so that it can resume its real function, that is to advice on issues related to the implementation of the project (not only at the level of the activities but also at the level

Of the results and objective) so that the right decisions can be taken, decisions of which community will sense and value the project and all established activities.

The DITEC project officers played a constructive role in facilitating process of trust building, reflection and decision making.

Table 16.EVALUATION OF WATER SOURCES PROTECTION ACTIVITY

Sn	Water source	Coordinates/GPS			Village	Division	Description of the activities done by - DITE
		Elevation (masl)	S.°	E.°			
1	Shokoni	1,615	03.19250	037.59084	Mokala	Mkuu	Tree and grass planting includes,Ficus spp,Eucalyptus spp,Albizzia spp,Rauvolfia spp,,Cedrella,Schinus molle,Vangueria spp.Leucaena leucocephala and Nepia grass
2	Motale	1,730	03.18937	037.57916	Mokala	Mkuu	Albizzia spp,Rauvolfia spp,Prunus spp planted
3	Itongoni	1,835	03.19575	037.57745	Mokala	Mkuu	Albizzia spp and boundary fixing
4	Uminga	1,856	03.19694	037.57617	Mokala	Mkuu	Grass,caesalpinia spp,combretum spp and terminalia spp.planted
5	Iriveriveni	1,951	03.19758	037.56793	Mokala	Mkuu	Grass planting and rehabilitation of natural regeneration,
6	Kiumu	1,756	03.19425	037.58076	Mokala	Mkuu	Albizzia spp planted
7	Mshereni	1,783	03.20058	037.58580	Mokala/Maharo	Mkuu	Rauvolfia spp,Cedrella mexicana planted.
8	Kifunika	1,622	03.21101	037.60161	Maharo	Mkuu	Fixing of boundary
9	Rua	1,711	03.22751	037.58068	Machamealeni	Mengwe	Fixing of boundary
10	Kiboro I	1,776	03.22458	037.58063	Machamealeni/Shimbimasho	Mengwe/Mkuu	Tree and grass planting,Ficus spp,Eucalyptus spp,Albizzia spp,Rauvolfia spp,prunus persika,Cedrella,Schinus molle,Vangueria spp.Leucaena leucocephala and Nepia grass
11	Kiboro II	1,619	03.22668	037.58681	Shimbimashami/Kenialeni	Mengwe/Mkuu	Tree and grass planting,Ficus spp,Eucalyptus spp,Albizzia spp,Rauvolfia spp,

5.4.FOCUSED AREAS MONITORED AND EVALUATED AND ITS ACHIEVEMENT.

5.4.1 Impact

The project started in 2005, so for environmental project it was too early to really measure the impact of the project. We tried to get an appreciation of the target group and the different other stakeholders on the different aspects of impact.

Table 17.TOTAL NUMBER OF TREE SEEDLING RAISED .

No	NAME OF NURSERY	TARGET	ACHIEVEMENT
1	Huruma Central nursery	150,00	147,400
3	KEDA Group	100,000	98,491
4	TECOSO Group	70,000	64,200
5	Ngambeni Group	15,000	9,117
6	CONVERT Sisters	15,000	13,208
7	Melkior Kital	5,000	3,227
8	Pasian Assenga	5,000	3,044
9	Florens Mrosso	6,000	21,996
10	Jackson Lenana	5,000	2,500
12	Mathias Marandu	5,000	4,100
11	Devota Mkenda	6,000	5,117
13	KIMAHUTU GROUP	5,000	3,638
14	Kelamfua Primary School	10,000	15,210
15	Mokaka Primary School	10,000	4,234
16	Maharo Primary School	10,000	16,249
			411,731

A rapid SWORT analysis on the evaluation of the project showed the following

Strength;

i. High relevance of the project activities.

ii. The project operates through DITEC and Rombo District Council structures.

iii. Strong involvement of primary schools

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 organic farming activities

Opportunities;

i. A good number of nice experiences and initiatives

ii. Commitment by the District and DITEC officials 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 means and capacity building

5.4.2 Organizational management impact.

Villagers Environment committees (VEC) and Watershed Management Team (WMT) were set up by the villages. This has a good impact on the organization capacities within the areas as long as these committees are not seen as something that has to be done for the donor. It is important that there is a kind of strategy and coherence between these committees. Strong environmental committee is responsible to guide all activities related

to environment and that works on an environmental policy and water development based on a good vision and mission to influence on positive development.

The leadership training provided by the project has an influence on the future organization capacities. Due to the government policies women are more and more participating in the different committees, village structures and so on.

5.4.3 Social impact and community participation.

All people interviewee were enthusiastic of the interventions of the DITEC. As well the evaluators as the group of young researches was impressed by the way both organizations were known in the area. It is a fact that DITEC is also implementing other complementary programmes, such as the environmental legislation and the Gender and Women Programmes sometimes in the same area.

5.4.4. Economic impact

The real economic impact is still limited; there vivid changes of the economic status of the groups involved in the projects especially the women groups involved in environmental component. What is important is that through the approach and by putting emphasis on the services runed in a environmental manner by community in the ward, the community can better prepared for more integration that has also to safeguard their social, economic and cultural values.

5.4.5 Environmental impact

The relevance of the project is high, but it should adopt a more integrated approach. Efficiency is correct as outputs are in a good relation to inputs and beneficiaries get added value in form of drinking and/or irrigation water.However,most of the projected activities are on the track.Nevertheles,an improved follow –up and a better participation of communities are needed. During the discussion with the villagers

and staff it became clear that there is not enough attention for the environmental aspects. The evaluation team ranked clearly the interest of the community on the watershed management through PRA approach and hence does the participatory environmental impact assessment.

Table 18.Farmers trained on the use of natural pesticides .

S/No	NAME OF PARTICIPANTS	VILLAGE
1	Ruben Paulo Assenga	Mokala
2	Noel Muhimili	Mokala
3	Florence Mrosso	Mokala
4	Mathiasi Marandu	Mokala
5	Pascal .J . Swai	Mokala
6	Eliuta Mtono	Mokala
7	Peter Thomasi	Mokala
8	Joachimu Lyakurwa	Maharo
9	Mekiori Kitali	Maharo
10	Batholemeo Urrassa	Maharo
11	Joseph Chezue	Maharo
12	Michaeli Mzee	Maharo
13	Christian Pasian	Maharo
14	Herman Assenga	Maharo
15	Maharo Primary School (Head teacher)	Maharo
16	Julina Philip	Kelamfua
17	Kelamfua Primary School (Headteacher)	Kelamfua
18	Lucas Macha	Kelamfua
19	Jackson Lenana	Kelamfua
20	Donati Peter	Kelamfua

5.4.6. Impact on gender relations

Women and Men in the chagga context have different roles and responsibilities and therefore they have different interests and need. Women are more and more considered as an important economical actor who has to participate in the whole

decision making process within the chagga area. Where in the past they were responsible for the household (food preparation, fetching water, organizing the household and they got access to milk and some other by products of animals), they start more and more taking part in decisions.

5.4.7. Linkage and relation with other stake holders

These are as follows; Communities of three villages in Kelamfuamokala ward, Rombo District Council Three primary schools located in three villages, Mkuu Secondary School, Mkuu Roman Catholic Church, TECOSO and KEDA

5.5 SUSTAINABILTY

The project has accrued very high participation of the local community since its start, this to some extent assure the existence of sustainability of the project after the phasing out of the external funding sources

Technical and financial support from DITEC will continue so as to assure a good sustainability of this project. On the other hand trained villagers will continue to support watershed management team in their respective villages in the management of watershed areas since they will use the knowledge acquired during various trainings sessions of the projects activities. The initial evaluation finds out if the chances that the positive results and effects of the project will continue to be produced after the ending of the assistance are high.

5.5.1Policy

All of the activities undertaking by the project fits completely within the polices of the Tanzania government and making the communities responsible corresponds

with the policy of the government. Women empowerment is also a priority for the project. It has to be clear that communities are responsible and has to supervise to retrain all watershed management skills delivered by the project.

5.5.2 Social – cultural

All interventions of the project are highly appreciated by the beneficiaries. The ways they are implemented take into account the cultural aspects. Also the hierarchy is respected. For the election of the watershed management team and the paraprofessional facilitators the villagers were involved in the selection

Because the solidarity between the members of the community is very high, alot of emphasis has to be put on the sensitization of all people involved and the strengthening of the committees of which the composition has to be such that the committee is respected by all villagers. Conditions of collaboration and the ways sustainability shall be ensured have to be discussed from the beginning in a transparent way with all the people involved. The chagga society is changing. They decided themselves to change some cultural practices in order to give an answer to the water scarcity problem. The roles and the importance of women are becoming more and more important.

5.5.3 Technical

The technical choices made in such a way that it will influence the sustainability of the activities. However out of the past experience with the government department and other institutions it is clear that, organizing the participatory watershed

management in a sustainable way is very difficult. Also more and more research is done on alternatives. These reflections are not taken up in this project.

It is also clear that, if the water problem in the different sites cannot be solved in a sustainable way, the conflict within the community especially the up stream and down stream community will result. The project is putting a lot of emphasis on the use of watershed management team's spirit to address this issue. It remains important to stress the use of tradition skills based o n local community as a good alternative for the solving the problem of protection of water source area. So a close follow up, access to information, networking is important aspects that have to be taken into account if one wants to guarantee sustainability.

5.5.4 Institutional and organization capacities.

The capacities of the committees and evaluation team are strong enough to guarantee the sustainability of the activities they are responsible for. Most committees started recently. They lack leadership capacities but they are spiritually task oriented. Planning and monitoring is always very strong and the mission and vision of the organization is good.

The collaboration with other actors and government services is extremely good to increase the organizational and technical capacities to contribute to the sustainability of the project.

5.5.5 Financial/ Economic

For many of the activities that have to continue in order to guarantee the sustainability of the effects, financial resources are needed. For the watershed management activities, resources a needed. The community was involved right from the beginning of the project and therefore this will ease the sustainability after phasing out of the project, Small technical and financial support from DITEC will continue to assure the good sustainability of this project.

CHAPTER SIX

6.0 GENERAL CONCLUSION

Successful implementations of this project will add a good opportunity of community in managing ecosystem and water sustainably.Ecosystem and water are inextricably linked, this can be simply defined as the conditions and relationships through which natural ecosystem, and the species that make them up, sustain and fulfill human life. In the water context, this translates to the contribution that ecosystems make to water supply and quality and the ways in which they use water to generate other economic goods and services. We therefore calls community to adhere a good water source, water quantity and quality management and hence this to contribute high in raising standard of their living. It is anticipated that, at the end permanent behavioral change amongst communities and other beneficiaries, will have lasting also sustainable with good impact on the watershed management.

The government of Tanzania has placed water and environment as a key pillar in its poverty reduction stratergy.Tanzania has also activity participated in the global effort to achieve millennium development goals and word summit on sustainable development. The goals aim at target on environmental, watershed managent and sanitation, that is to reduce by at least half the country population that is without access to safe and adequate water and sanitation by 2005(Water policy 2002) .This implies that the sector needs to adopt urgent and well coordinated strategies and action to ensure that coverage of both water supply and sanitation is accelerated and satisfied.

Understanding the link between poverty, watershed management, environment and sanitation is very necessary. water is essential to life and is part to of every cell father more is necessary for most basic functions like respiration and digestion access to clean and safe water is major requisite for poverty reduction, improving human health conditions and promoting sustainable development

The study has found out that water shortage contribute to social and economic problems to human beings. Some of this problem are low income, poverty, low nutrition and water related diseases e.g. trachoma and malnutrition. Inadequate water and sanitation services to poor people increase the living coasts, lower their income damage their well being and even make life more difficult

Readiness of villagers contributes on watershed management and pay and take care of the water supply will largely depend on factors such as the extent to which the community is involved in all phases of the watershed management project and water supply schemes.

6.1. RECOMENDATION

After two years of project activities, it is too early to talk about outcome or impact. However, the evaluation team could verify, that there is raising awareness at all levels about environmental issues and the need to protect water sources. In one case people report that a watersource after protection (people abandoned crop cultivation around the watersource gives now more and continuous water. Some immediate recommendations include;

i. To introduce a systematic capacity building for the project staff and for the communities.

ii. To introduces a systematic and structured follow – up. This includes availability of the necessary means and (eventually) a system of incentives.

iii. To introduce a system facilitating downward information flow and accountability

iv. To adopt an integrated approach including other important factors (Land shortage, food security, migration, poverty, population growth, etc) in the project design and planning.

v. To expand project activities to get a real impact and to became a watershed management project.

The big challenge noted in the implementation of the project was to make project sustainable. Therefore it is important to put more emphasis on organizational development and capacity bulding.Social change is a slow process. The project came at the right moment, community are confronted with a lot of changes.

For the community to maintain their watersource area component a more holistic approach is needed. To reach a more holistic approach more emphasis has to be put on developing a master plan for watershed management at village level instead of realizing some streams management here and there.

We recommend that the project is working very closely with the villages committees that have the function to overlook all environmental activities of the villages, to

develop a long term plan to improve the environment and to plan and monitor all activities undertaken in order to improve the watershed areas in their villages.

In order to have a good impact on these organizational structures it is important to concentrate the effort in a limited area i.e. wards. Village's environmental committees can learn from each other, they can harmonies their approaches; they can join forces to influence the higher levels of decision making.

6.2 THE BALANCE BETWEEN LITERACY AND OTHER PRESSING COMMUNITY PROBLEMS.

In many groups the focus is more on solving development issues and not on the classical literacy. The link with community development is evident but until now the community development department has nothing to do with this literacy programme.A better collaboration between the two departments is needed if we want to sustain a real dynamic and the continuation of the groups that will be more and more involved in community development issues.

Project advisory committee has to take up its role and responsibilities. This committee has to play an important role in the planning and the monitoring of the project not only at the level of the activities but also at the level of the results.