

THE SOUTHERN NEW HAMPSHIRE UNIVERSITY

AND

THE OPEN UNIVERSITY OF TANZANIA

MASTER OF SCIENCE IN COMMUNITY ECONOMIC DEVELOPMENT

(2007)

**ASSESSING THE CONTRIBUTION OF DONET TO ENVIRONMENTAL
CONSERVATION AND TO LIVELIHOODS OF SMALLHOLDER FARMERS
IN MVUMI MAKULU WARD, DODOMA RURAL DISTRICT**

MDENDEMI, REHEMA TIBERIO (MRS)

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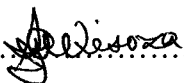
**A PROJCT REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN COMMUNITY
ECONOMIC DEVELOPMENT IN THE SOUTHERN NEW HAMPSHIRE
UNIVERSITY AT THE OPEN UNIVERSITY OF TANZANIA**

MDENDEMI, REHEMA TIBERIO (MRS)

SIGNED APPROVAL

I, the undersigned, certify that I have read this project report titled, **“ASSESSING THE CONTRIBUTION OF DONET TO ENVIRONMENTAL CONSERVATION AND TO LIVELIHOODS OF SMALLHOLDER FARMERS IN MVUMI MAKULU WARD, DODOMA RURAL DISTRICT”**, and found it acceptable in partial fulfilment of the requirements for the Master of Science Degree in Community Economic Development of Southern New Hampshire University of the United States of America and the Open University of Tanzania.

Name of supervisor : Dr. James L. A. Kisoza

Signature..........

Date.....*22 August, 2007*.....

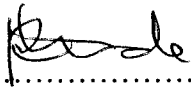
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DECLARATION

I, Rehema Tiberio Mdendemi declare that, except for references to other people's work which have been duly acknowledged, this dissertation is the result of my own work and that it has not either in part or in whole been presented for a similar award in any other Institute of Higher Learning.

Signature.....

Date.....22 August, 2007

DEDICATION

To my lovely husband Tiberio and darling daughters Praise, Glory, and Tumaini

ACKNOWLEDGEMENT

Praise, glory and honor be to the Almighty God who made it possible for me to make it!

It is only by His grace that I have been able to go through this course.

I wish to express my sincere thanks to the Permanent Secretary, Public Service Management through its Gender Unit, for the sponsorship without which I could have not been able to participate in this study program.

I wish to express my deepest appreciation to Dr. L. J. A. Kisoza who was my supervisor, for his dedication, guidance, and encouragement during the preparation of this report. I'm also indebted to Dr. F. G. H. Hawassi for his advice, comments and corrections of the manuscript. Mr. A. Sarwatt and Mr. T. Mwageni were also constantly consulted for literature review.

I am highly indebted to my husband Mr. T. R. K. Mdendemi for the wonderful cooperation and support throughout the period of my study. Apart from bearing all family responsibilities alone, he worked hand in hand with me in most all of the relevant activities of this work. My thanks also go to MALDO Ms Daina Myuanga for her prayers, encouragement and support during my study time.

This report could have been impossible without the willingness and support by the smallholder farmers who were the source of the needed data and information. Important also in this category are the extension and program officers from DONET, DEMAT, Departments of Community Development, Forestry, Agriculture and Natural Resources. Special thanks in this regard go to the District and Mvumi Makulu Ward leaders for the assistance received in introducing me to the community

My thanks also go to Ms Joyce Kiula for her efficient work in typing this report.

Finally, my special thanks are extended to all my family members and friends for their love, prayers, moral and material support!

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LIST OF ABBREVIATIONS

CBOs	-	Community Based Organizations
CMSR	-	<i>Centro Mondialita Sviluppato Reciproco</i> (NGO-for voluntary Service solidarity and co-operation)
COWESA	-	Community-Based Water, Environment and Sanitation
DEMAT	-	Dodoma Environmental Management Trust
DOBEC	-	Dodoma Beekeeping Co-operation
DONET	-	Dodoma Environmental Network
HIV/AIDs	-	Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome
INADES	-	<i>Institut Africain Pour le Developpement Economique et Social</i>
KIHATA	-	Kilimo Hai Tanzania
LVIA	-	Ley Volunteer International Association
MALDO	-	Municipal Agriculture and Livestock Development Officer
MIGESADO	-	<i>Miradi ya Gesi ya Samadi Dodoma</i>
MRTC	-	Mvumi Training Centre
URT	-	United Republic of Tanzania

ABSTRACT

This study on “assessing the contribution of DONET to environmental conservation and livelihoods of smallholder farmers” was conducted in Mvumi Makulu ward of the Dodoma Rural District. The study involved a participatory community needs assessment in the study area. The objective of this study was to assess the contribution of DONET in reducing environmental degradation among smallholder farmers, by focusing on livelihood activities support for improved crop and livestock productivity. By using a sample of 120 respondents and 7 key informants, it was found that the demographic and socio-economic factors such as age, gender, income source, farming methods and type of energy used were important predictors of land degradation in the study area.

It was recommended that DONET should direct more efforts to improving the activities upon which the smallholder farmers earn their living and whose the intervention efforts are felt within a short time- farming methods, off-farm activities, energy sources and management skills. Based on recommendations of the study and the community needs assessment, a project on “Capacity Enhancement of Smallholder Farmers for Environmental Conservation and Improved Productivity” was proposed. The implementation of the project is at its early stage.

EXECUTIVE SUMMARY

This project report on “Assessing the contribution of DONET to Environmental conservation and livelihoods of smallholder farmers” is a result of a participatory community needs assessment conducted in Mvumi Makulu Ward between December 2005 and June, 2006. The Dodoma Environmental Network (DONET) was responsible for this study as a financial facilitator of the empowerment process to this community.

The Community Economic Development Officer (CED) was a key technical advisor-cum-facilitator of all relevant processes in the area. Based on identified needs a project on capacity enhancement of smallholder farmers was conceived for implementation.

The community needs assessment exercise generated key information on degradation status in Mvumi and the likely causes. It was found that the community members earned low incomes due to low agricultural productivity. Although this Ward is one of the semi-arid areas with unreliable rainfall; poor farming methods coupled with increased land degradation due to indiscriminate tree cutting and overgrazing, were found to be the major causes of poverty. It was found that if these problems were fully addressed incomes for smallholder farmers could be improved.

A detailed study to assess the role of DONET in environmental conservation and, hence agricultural productivity in the area was conducted. The objective of this study was, among others, to identify the main economic activities contributing to environmental degradation, and examine the effectiveness of the conservation interventions introduced by DONET. Using a sample of 120 respondents from a community of 10,218 populations, it was found that socio-economic and demographic characteristic such as age, type of economic activities, level of formal education and type of income source; were important predictors of environmental degradation in the study area.

Use of the same piece of land for long period, non-use of organic fertilizers, overstocking, overgrazing and limited use of improved cook stoves were found to be the main causes of land degradation in the study area.

There was a general awareness of the community members on causes of environmental degradation and how to prevent it. DONET had been able to disseminate knowledge on tree planting and environmental sanitation.

Conservation activities as advocated by DONET were not directly linked to people's day-to-day activities to enable them take relevant measures. Based on identified community needs, a project on capacity enhancement of smallholder farmers' aimed at addressing environmental problems was proposed. This

project aims at advocating correct crop and livestock production methods and techniques. The project had identified two smallholder farmer groups-one for livestock keepers and another for grape producers as entry-points for interventions to Mvumi Community. From these two groups, the services are expected to expand to other people in the community.

CHAPTER ONE

COMMUNITY NEEDS ASSESSMENT

This chapter provides the results of the community needs assessment which was conducted in the project area. It starts by explaining the profile of the study area in terms of demographic factors, climatic conditions, and economic activities. It also provides the objectives, research questions, justification, findings and the recommendations based on the study findings.

1.1 Community profile

1.1.1 Demographic data

Mvumi Makulu ward is in Dodoma Rural district. According to 2002 Population and Housing Census, the ward has a total of 10,218 people of which 4,671 are males and 5,543 are females. There are 2,117 households in the ward. The ward is located 30 km South of Dodoma Municipality.

1.1.2 Climatic conditions

The area has semi-arid type of climate with an average annual rainfall of 550mm-600mm raining between December and April.

1.1.3 Economic activities

The major economic activities are agriculture and livestock keeping. About 127 households are engaged in both crop farming and dairy keeping, while the rest of households are only crop producers. Crops which are grown are sorghum, maize,

simsim, groundnuts, grapes, cassava and sweet potatoes. Livestock kept include cows, goats, pigs and chicken.

1.2 Community Needs Assessment

In order to identify the needs of the Mvumi Makulu community and hence, the project to address them, a study was conducted to assess the how DONET as an environmental organization has been conducting its support activities to smallholder farmers.

1.2.1 Objectives of the study

1.2.1.1 General objective

The general objective of this study was to assess the performance and contribution of an NGO (DONET) to environmental conservation and livelihoods of smallholder farmers in Dodoma rural district.

1.2.1.2 Specific objectives

The study was guided by the following specific objectives:

- (i) To identify the main economic activities in the study area.
- (ii) To assess the environmental conservation practices introduced by DONET in the study area.
- (iii) To determine the socio-economic and demographic factors affecting performance of DONET in the study area
- (iv) To recommend and implement some recommendations on improvement of DONET activities in the study area

1.3 Research Questions

The research questions answered in the study were as follows:-

- (i) Are the socio-economic and demographic characteristics of the respondents having any effect on environmental conservation?
- (ii) What are the economic activities undertaken by smallholder farmers which cause environmental degradation in the study area?
- (iii) What are the environmental conservation interventions from DONET directed to smallholder farmers in the study area?

1.4 Justification of the Study

The survey intended to link the project proposed activities to those of the target population and establish how the proposed intervention activities would reinforce productivity of those already done by the people on daily basis.

Given the fact that the proposed study area suffers from low productivity in terms of crops and livestock, limited grazing area and environmental degradation-which have all made it difficult to meet their basic needs, the results of this survey will no doubt apply to people surveyed by proposing better livelihoods mechanisms.

The findings emanating from this study provide useful information regarding the contribution of DONET as an NGO in conserving the environment for sustainable development. This information is vital for policy makers at District and national levels

for facilitating establishment of a comprehensive and sustainable environmental conservation measures.

The study also provides useful information to DONET and other organizations involved in environmental conservation by revealing important areas of focus, approaches and entry points to the community for maximum cooperation from the beneficiaries and other stakeholders.

The results of the study also provide some information to smallholder farmers; Non-Governmental Organizations, Community Based Organizations, Government and other institutions and agencies regarding the pro-poor environmental conservation measures. Furthermore, the results of this study are invaluable resources, as they will enable all stakeholders who are dealing with environmental conservation issues to come up with workable mechanisms on improvement of the livelihoods of the rural poor in the wake of environmental degradation.

1.5 Research Design

The study employed cross-sectional survey in order to gather relevant information from smallholder farmers, opinion leaders, government officials, local leaders and NGOs dealing with environmental conservation issues. This was important in order to collect enough information that could help to make a rational assessment of the contribution of DONET to environmental conservation and the agricultural productivity.

The researcher worked with three categories of respondents. These were:

- i. Smallholder farmers (livestock keepers and crop producers);
- ii. Government officials (Agriculture and livestock extension officer, Forest Officer, Community Development Officer, Ward Executive Officer and a councilor);
- iii. Non-Governmental officials from DONET and DEMAT. DEMAT is also working on environmental conservation in Mvumi Makulu ward.

1.6 Sample Size

The target population of this study was smallholder farmers. It is from this population that a total of 120 out of 2,117 smallholder farmers' household heads were sampled to represent the entire population in the study area. Out of the total sampled respondents, 58 were males and 69 were females. The sample was capable of revealing the salient environmental, social and economic issues in the ward.

1.7 Sampling Techniques

Both systematic and purposive sampling methods were used to obtain wards, respondents and key informants.

1.7.1 Purposive sampling

Mvumi Makulu ward was purposively selected for this study from which smallholder farmers were obtained. The choice of this ward was based on the fact that it is one of the areas mostly affected by environmental problems which are the current priority development areas of the government. The area is also one of the DONET's priorities

whose activities have just started. The same method was used to obtain 7 key informants from government and Non-Governmental officials who were well placed to give relevant information on the study topic.

1.7.2 Systematic sampling

The researcher had requested village government leaders to prepare a list of smallholder farmers who were either engaged in environmental conservation projects or involved in crop farming and/or livestock keeping to be used as sampling frame. A total of 2,117 smallholder farmers' household heads were given in the list. From the list, 120 respondents were drawn using a systematic random sampling technique.

The procedure involved the selection (household heads) randomly taking the first household head, between one and eighteen (18), number fourteen (14) was chosen. Therefore the researcher began with the fourteenth name on the list and counted every 18th name after that attained a sample of 120 names of smallholder farmers.

1.8 Data Collection Methods

In carrying out this study, three techniques of data collection were employed. These include; Questionnaire survey, Informal interviews, and observations.

1.8.1 Questionnaire survey

A structured questionnaire (Appendix 3) was designed to capture both qualitative and quantitative data from smallholder farmers. It consisted of both open and closed ended questions. The questionnaire was pre-tested to 10 respondents from a small selected area

during a pilot survey to check the relevance of questions to the intended respondents. The fieldwork involved questionnaire administration by the researcher and two enumerators to sampled respondents, and discussion with key informants and government officials.

1.8.2 Informal interviews

Informal interviews with government officials, Environmental Conservation Organizations (DONET, DEMAT) and other stakeholders were made using check list of questions in order to obtain data related to problems of environmental degradation, understanding the capacity on Environmental conservation by smallholder farmers and the effectiveness of environmental conservation measures by DONET on agriculture development.

1.8.3 Observation

This method was used to supplement data collected through interviews and questionnaires. Physical visits were made to the area of study in order to facilitate direct observation on different issues pertaining to environmental degradation, the eroded areas, agriculture production methods and practices in use, number of livestock per household and areas under deforestation.

It was observed that, the land was bare, affected by sheet and gulley erosion, deforested and the use of 'sesa' farming system in hilly areas.

1.9 Type of Data Collected

Data related to the contribution of DONET on environmental conservation, characteristics of respondents, production methods used, knowledge on environmental issues, production (tons/acre) and degradation situation were collected by single visit interview to target group using questionnaire and informal and / or formal discussion with key informants.

1.10 Data Analysis

After collection, the data were processed and analyzed in accordance with the outline that was laid down in guiding research questions. This was done for the sake of contemplating the comparison and analysis in meeting the requirements of this project. Descriptive statistics used to analyse data in this study were frequencies and percentages. These statistics were used to determine the effect of socio-economic and demographic characteristics of the respondents on environmental conservation; identify the main economic activities contributing to environmental degradation; and examine the environmental conservation intervention introduced by DONET in the study area. The analyzed data were presented in the form of cross tables. Both SPSS soft ware package version 11.5 and Micro Soft Excel were used

1.11 Study results and discussion

1.11.1 Socio-economic and demographic characteristics of the respondents

Two demographic factors namely age and sex and two socio-economic factors (measured in terms of level of education of a respondent, and source of income of the

respondents) were considered. Contribution by DONET to environmental conservation for sustainable development was then judged on the basis of these four characteristics to see whether they influenced the environmental conservation on the study area or not.

(i) Age of respondents

The interest was to investigate whether or not age contributes to environmental conservation for sustainable development amongst smallholder farmers. The assumption was that young smallholder farmers are likely to destroy the environment because they carry out income earning activities which largely depend on environmental offering. Respondents were asked to indicate the most dependable source of their income. The respondents' responses are summarized in table 1.

Results in table 1 shows that 53.3% of respondents were dealing with agriculture activities, whereby the majority (50%) of them in age category of 20-45 years. Also those who were dealing with charcoal making and fire wood selling with the majority (68.4%) again falling within 20-45 years of age.

In this category of income source, the elderly people (56-70 years) were the majority of beneficiaries.

A small proportion of respondents earned their income basically from sale of their livestock. In this category the elderly people (56-70 years) were the majority of beneficiaries.

Table 1: Respondents' economic activities by age group categories in the study area

Activities	Number of respondents(n=120)			Total Sample
	Age Distribution			
	20-45 YRS	46-55 YRS	56-70 YRS	
Agriculture	32 (50.00)	20 (31.25)	12(18.75)	64 (53.33)
Livestock Keeping	04 (28.60)	06 (42.80)	04 (28.60)	14 (11.67)
Charcoal burning and/or selling of fire wood	26 (68.40)	08 (15.80)	08 (15.80)	42 (35.00)
Total	62 (51.67)	34 (28.33)	24 (20.00)	120 (100.00)

NB: Number in brackets indicates % of the respondents

Source: Own survey data (2006).

According to results in Table 1, the young energetic people were the ones engaged in agriculture and charcoal making. This indicates that age is likely to be a predictor of environmental conservation basically due to division of labor among the community members. Young people seem to work more on land than the old people, and they destroy more of the environment than the old. These results as indicated in table 1 are in line with the study assumption that young people destroy more the environment than the old people. Suggesting that this group should be targeted by the interventions aimed at reversing environmental degradation.

(ii) Gender division in use of environmental resources

In most of our African cultures, women are the ones who use more the of environment resources for subsistence farming along with domestic chores than men even if they can't own the resources. It was assumed, therefore, that if the environmental organizations in the study area were to conserve the environment, women could be the major target group for sustainable development since they are the implementers of activities based on land.

The results in Table 2 show that the majority of respondent (71.4%) were females and only 28.6% of respondents were male. This indicates that majority of land cultivators were females. However, 34 respondents (89.5%) out of 38 respondents who were livestock keepers were males. Only 10.5% of the respondents were female livestock keepers. Likewise, all charcoal makers and firewood dealers were men.

Table 2: Respondents main economic activities by gender

Type of Activities	Sex of Respondents		Total Sample
	Male	Female	
Farming	20 (28.60)	50 (71.40)	70 (58.33)
Livestock keeping	34 (89.50)	04 (10.50)	38 (31.67)
Charcoal/firewood making	12 (100.00)	0	12 (10.00)
Total	66 (55.00)	54 (45.00)	120 (100.00)

NB: Number in brackets indicates % the of respondents

Source: Own survey data (2006)

These results in table 2 were contrary to the expectation that women were more responsible for environmental degradation in rural areas. It is now clear that men are also destructive due to charcoal and firewood making. The target to environmental education should be both men and women.

(iii) Education level of the respondents

It is often argued that education has a potential for opening up new life opportunities since it is an eye opener.

It can also be assumed that educated people can easily appreciate the role of environmental organizations in the fight against environmental degradation and are thus likely to engage on environmental conservation by using improved farming methods. Respondents were asked to mention their level of education they had attained, and the type of farming methods they were using, to see whether those who had more education were using recommended farming methods. Ridge making was used to represent a better farming method than “sesa” farming. Similarly, tilling of land was regarded as the best method of land preparation.

The results in Table 3 shows that, 50 respondents (62.5%) out of 80 respondents who practiced “sesa” farming had no formal education and only 4 respondents (10%) out of 40 respondents who practiced ridge making had no formal education, followed by 16 respondents (40%) who attained primary education.

Table 3: Type of farming methods used by respondents by level of education

Farming Methods Used	Educational Level Attained by Respondents			Total Sample
	Primary Education	Secondary 'O' level	None	
Ridge making	16 (40.0)	20 (50.0)	4(10.0)	40 (33.33)
“Sesa” farming (no ridges)	26 (32.5)	04 (05.0)	50(62.5)	80 (66.67)
Total	42 (35.0)	24 (20.0)	54 (45.0)	120 (100.0)

NB: Number in brackets indicates % of the respondents

Source: Own survey data (2006)

Similarly the results in Table 4 shows that, 60 respondents (75%) out of 80 respondents who were burning crop residues and grasses in farm preparation were those who lacks formal education, and that they were not tilling the land.

Table 4: Respondents Land/farm preparation methods by education level

Type of land/farm preparation used	Level of Education Attained by Respondents			Total Sample
	Primary Education	Secondary 'O' level	None	
Burning of crop residue and grasses	6 (1 20.0)	4 (5.0)	60 (75.0)	80 (66.6)
Slashing down of grasses and crop residue and leaving on the land.	6 (30.0)	12 (60.0)	2 (10.0)	20 (16.7)
Tilling	8 (40.0)	12 (60.0)	NIL	20 (16.7)
Total	30 (25.0)	28 (23.3)	62 (51.7)	120(100) (100.0)

NB: figure in brackets indicates% of the respondents.

Source: own survey data (2006)

These results in Table 4 show that the level of formal education is a predictor of conservation of environment in Mvumi Makulu ward.

(iv) Income sources of the respondents

The source of income of the respondents was taken to predict occurrence of environmental degradation if respondents depended on activities which are related to the environment as a source of their income.

Results in Table 5 shows that, most of the respondents (80%) obtain their income from sale of charcoal and or firewood, followed by selling of agricultural products (11.7%) and lastly selling of livestock and their products.

Table 5: The main sources of income of the respondents in Mvumi Makulu Ward

Source of income	Number of respondents	Percentage
Sale of Agriculture Products	14	11.7
Sale of Charcoal and Fire Wood	96	80.0
Sale of Livestock and Products	10	08.3
Total	120	100.0

Source: own survey data (2006)

It can generally be said that demographic and socio-economic characteristics of the respondents are important predictors of environmental degradation. We have seen that women were engaged in farming while men were charcoal makers and firewood cutters. So the knowledge or skills on environmental conservation must be directed to both men

and women. Age was also an important factor because most of young people were involved in different activities including farming and charcoal burning. It was found that the educated respondents were the ones who used improved farming methods. Therefore, the environmental conservation organizations must take into account the level of education of smallholder farmers if they are to effectively change their conservation behavior.

1.11.2 Economic activities of the respondents

In this aspect, it was assumed that overgrazing, cutting down of trees for farms expansion or shifting cultivation, making of charcoal and minimum or no use of organic fertilizers in their farms was the main causes of ever increasing environmental degradation in the study area. Respondents were asked to indicate the number of livestock owned, number of years used in farming on the same piece of land, types of methods used in farming, if they used organic fertilizers or not, and whether they used improved stoves or not- as measures of environmental conservation.

(i) Period used in farming on the same piece of land

The basic assumption was that smallholder farmers who use relatively shorter period in farming on the same land were those who do not use organic fertilizers, instead they look for virgin or fertile land, cutting of trees and hence acceleration of deforestation which cause soil erosion and finally land degradation.

Respondents were asked to mention the number of years used to cultivate the same piece of land.

Table 6 shows that, majority of respondents (81.7%) were using land for less than five years. This implies that they used to go for another area/land to start new farms, thereby cutting down trees and thus causing land degradation.

Table 6: Period used for farming the same piece of land by respondents

Period	Number of Respondents	Percentage
More than ten years	4	3.3
Between 5 and 10 years	18	15.0
Less than 5 years	98	81.7
Total	120	100.0

Source: Own survey data (2006)

(ii) The use of organic fertilizers

One of the most important roles of organic fertilizers is to conserve the soil and increase soil fertility. It was expected therefore, that smallholder farmers who used organic fertilizers knew how to conserve land and hence sustainable use of the soil.

The results in 7 show that, there were 110 respondents (91.7%) who were not using organic fertilizers. This implies that most of them were starting new farms after their previous farms had been exhausted and thus accelerating deforestation in the study area and hence land degradation.

Table 7: The use of organic fertilizers by respondents

Apply organic fertilizers	Number of the respondents	Percentage
Yes	10	8.3
No	110	91.7
Total	120	100

Source: own survey data (2006)

(iii) Livestock holds by respondents in the study area

The number of livestock owned by respondents can explain not only the manner in which the large number of livestock can cause soil erosion, but also the likelihood that an individual is able to use improved methods of livestock keeping, which are environmentally friendly.

The respondents were asked to indicate the number of livestock they owned. Table 8 shows Livestock holdings categories by the respondents.

The results in Table 8 show that, a total of 66.7% respondents out of 100% of the respondents own 1 to 4 livestock. This is relatively a small number. This implies that people in the study area had started to keep livestock using recommended methods in 2003. Therefore livestock is currently not a cause of soil erosion or environmental destruction in the study area since majority of livestock keepers own between 1 - 4 improved cows which can be kept indoors.

Table 8: Livestock holdings categories in the study area

Holding category	Number of Years					Total
	2001	2002	2003	2004	2005	
Between 1 and 4	0	0	20(16.7)	24(20.0)	36(30.0)	80 (66.7)
Between 5 and 10	0	4(03.3)	6 (05.0)	10 (08.3)	14 (11.7)	34 (28.3)
Between 11 and 50	2 (1.7)	2 (1.7)	0	0	0	04 (03.3)
Over 50	2 (1.7)	0	0	0	0	02 (01.7)
Total	04 (03.3)	06 (05.0)	26 (21.7)	34 (28.3)	5 (41.7) 0	120 (100.0)

NB: Number in brackets indicates % of the respondents

Source: Own survey data (2006)

(iv) The use of improved stoves

The use of improved stoves has an influence on the environmental conservation since the rate of using trees for firewood will be reduced, therefore forest will be conserved. Respondents were asked whether they were using improved stoves which use little firewood or not.

The results in table 9 show that, 85% out of 100% of the respondents were not using improved stoves. This implies that there is much use of trees for firewood and hence deforestation in the study area.

Table 9: Response distribution on use of improve stoves in the study area

Response	Number of respondents	Percentage
Yes	18	15.0
No	102	85.0
Total	120	100.0

Source: Own survey data (2006)

1.11.3 Environmental conservation practices implemented by DONET in the study area

The researcher was interested to know whether smallholder farmers had adopted any environmental conservation intervention from DONET so as to improve productivity and reverse environmental degradation in the study area. Table 10 and 11 summarizes the respondent's knowledge on environmental conservation.

Results in table 10 show that, 76.7% of the respondents had some knowledge on environmental conservation.

Table 10: Respondents knowledge on environmental conservation in the study area

Knowledgeable	Number of respondents	Percentage
Yes	92	76.7
No	28	23.3
Total	120	100

Source: Own survey data (2006)

The results in table 11 show that, 74% out of 100% of the respondents who had some knowledge on environmental conservation had received it from DONET; while 17.4% got the knowledge through experience.

Table 11: Responses distribution on source of environmental conservation knowledge by respondents in the study area

Source of knowledge	Number of respondents	Percentage
From school	4	4.3
From DONET	68	74
By experience	16	17.4
From friends	4	4.3
Total	92	100

Source: Own data survey (2006)

This implies that DONET had significantly contributed to environmental conservation through training conducted in the study.

Respondents were also asked to explain the type of knowledge they had about environmental conservation. This was important in assessing whether the activities of DONET were likely to be sustainable in the study area.

The results in table 12 show that, eighty four respondents (91.30%) who had knowledge on environmental conservation only knew about tree planting and environmental sanitation. Only a small proportion of respondents (4.35%) had broader knowledge on environment issues. This implies that DONET had done a good job in disseminating some environmental conservation knowledge and skills.

Table 12: Respondents knowledge related to environmental conservation

Type of Interventions	Number of Respondents	Percentage
Planting trees, and environmental sanitation	84	91.30
Planting trees only	4	4.35
More than issues mentioned above	4	4.35
Total	92	100.0

Source: Own survey data (2006)

The respondents were also asked to indicate the number of trees planted in the previous year.

From the results in table 13, it is clear that 94 respondents (78.3%) had planted between 11-50 trees, Only 6 respondents (5%) planted between 1 – 5 trees. This implies that smallholder farmers in study area know the importance of planting trees in the study area.

Table 13: Response distribution on number of trees planted in the study area

Number of Trees Planted	Number of Respondents	Percentage
Between 1 – 5 trees	06	5.0
Between 6 – 10 trees	20	16.7
Between 11 – 50 tree	94	78.3
Total	120	100.0

Source: Own survey data (2006)

1.12 The Perception of Government Officials and Non-Government Officials on the Causes and Existence of Environmental Degradation in the Study Area

The researcher also wanted to know opinions of other stakeholders in relation to increased environmental degradation. Various reasons were mentioned by the government and NGO leaders, who were purposively selected and interviewed, on the causes of the ever increasing environmental degradation in Mvumi Makulu ward. They remarked that the smallholder farmers had been using traditional farming methods some of which are not environmental friendly. It was also their general opinion that, lack of alternative energy source in the study area resulted in high demand for firewood and hence more trees were cut-down. Thus exacerbating environmental degradation.

1.13 Summary of Key Findings of the Study

In this study, three research questions have been answered in order to assess the contribution of DONET on environmental conservation.

In the first research question it has been found that of the four demographic and socio-economic characteristics investigated, all four - that is age, gender, level of education and sources of income were important determinants of environmental conservation by smallholder farmers in the study area. A close investigation has revealed that demographic and socio-economic characteristics of the respondents in the study area have strong effects on environmental conservation.

In the second research question it has been found that there was no overgrazing in the study area. But the farming methods used, dependency of smallholder farmers on fuelwood for their income, and the type of cooking stoves were the main causes of ever increasing environmental degradation in the area.

In the third research question it has been found that, most of people were aware of environmental conservation and most of them said that the environmental conservation knowledge on tree planting and environmental sanitation had been received from DONET. Therefore DONET empowered smallholder farmers in the study area are capacitated by DONET in order to reduce environmental degradation.

The study identified poor farming methods, dependence on fuel wood as a major source of income and limited use of manure as being the main causes of land degradation.

1.14 Conclusions From the Findings

DONET has concentrated on the tree planting campaign in the study area which is not enough in addressing the problem of environmental degradation. Socio-economic activities are the core of the problem and, therefore, livelihood activities in terms of farming methods, energy supply and income sources need to be the areas of core engagement of DONET.

Capacity building of smallholder farmers in terms of training, coaching and facilitating demands a lot of efforts, resources and participation of target beneficiaries. It may as well entail a lot of experimentation and a continuous review of goals and objectives over

the life of the project so as to adjust them in line with new realities of the beneficiary expectations and appropriations. This is because smallholder farmers are normally slow to adopt new technologies, which seem alien to them, especially so when they feel that the means of their survival are under threat.

1.15 Recommendations From the Study

It was recommended that smallholder farmers be trained on the use of sustainable farming methods and be encouraged to apply dung manure for improved crop yields. It was also recommended that smallholder farmers be taught about alternative energy sources and the use of energy-saving cook stoves. Therefore, DONET should specifically target smallholder farmers who may need the knowledge in order to improve their livelihoods and hence reduce environmental degradation.

Training not only on environmental conservation, but also on alternative energy sources, off-farm economic activities, project planning and management skills, group dynamics, gender and environment, to smallholder farmers should be strengthened. It was found out that smallholder farmers had degraded the environment by practicing poor farming methods due to lack of knowledge on sustainable use of the environment

CHAPTER TWO

PROBLEM IDENTIFICATION

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

2.1 Problem Statement

Despite the growing awareness on environmental degradation in Dodoma and particularly in Mvumi where the interventions are being planned, smallholder farmers have not been able to come up with workable mechanisms to arrest the situation due to limited livelihood support activities and environmental conservation knowledge. Previous environmental conservation programs like “Hifadhi Ardhi Dodoma” (HADO) and the Mvumi Integrated Land-use Management Program (MILUMP) have had some impacts on land conservation. However their achievements were hardly sustained since they were a supply oriented. The programs also applied a more coercive approach with some by-laws enforced by the higher authorities.

In the recent past some other organizations, 0 which focus on environmental concerns have emerged with a more participative approach. These include Ley

Volunteer International Association (LVIA), Voluntary Service Solidarity and Co-operation (CMSR), *Miradi ya Gesi ya Samadi Dodoma* (MIGESADO) and Dodoma Beekeeping Co-operative (DOBEC) whose activities have not yet been of significant impact due to limited range of their activities.

The main economic activity in the study area is smallhold farming of food crops such as maize, sorghum and groundnuts. They need to improve production of these crops in order to improve their food security situation. However the yield of these crops has been declining year after year.

The community members attributed this problem to an increasing environmental degradation caused by over grazing and indiscriminate tree cutting coupled with poor farming methods due to inadequate knowledge and skills on environmental conservation.

The community needs assessment exercise led to a better understanding of the circumstances in which the community members are confronted, and thus to define the nature of the problem faced: poor farming methods, dependence on fuel wood as a major source of energy and income, poor yield as well as limited use of manure. There are the underlying causes of land degradation in the study area. Therefore a capacity enhancement was designed for smallholder farmers, as an intervention for reversing environmental degradation and improve crop yield.

2.2 Target Community

The project on capacity enhancement for smallholder farmers for environmental conservation and improved agricultural productivity aims at empowering the smallholder farmers of Mvumi Makulu ward in Dodoma Rural district. The project was identified by the community members who are also the implementers of the proposed intervention. The smallholder farmers will be empowered through environmental education training program which will enable their livelihoods to be improved through increased agricultural productivity.

2.3 Stakeholders

A number of players are stake holders in the project

Apart from Smallholder farmers who are the major stakeholder, others are DONORS, development NGOs, Governmental Departments, Local government and Religious organization stakeholders. Table 14 summarizes the roles and expectations of each stakeholder from this project.

Table 14: Stakeholders involved

Name of stakeholder (institution)	Functions/role	Area of operation	Expectations from the project	Possible contribution
1. Community-Based Water, Environment and sanitation (COWESA)	-Water and environmental management - Improving sanitation	Mpwapwa	-Organized people - To be partners	-community mobilization skills -Financial support
2.Dodoma	-Environmental		-New environmental	-conservation skills

Environmental management Trust Fund (DEMAT)	protection -Support to marginalized groups	Dodoma and Kongwa	management skills -Enlightened community members	- Experiences in the sector -Environmental education
3.Kilimo Hai Tanzania(KIHATA)	-Environmental friendly farming systems -Prudent use of natural resources	Dodoma region	- Focus on natural use of fertilizers - Open doors for them to operate - Enlightened community	-Experiences on use of farm yard manure and organic fertilizers -Use of locally available materials
4. Mvumi Rural Training Centre (MRTC)	- To provide short term trainings to smallholder farmers	Mvumi Division (Dodoma)	-Use them in trainings	- Capacity building skills and experience
5.MIGESADO	-Manufacture of improved cookstoves -Installation of biogas plants	Dodoma	- Source of market for stoves or biogas plants	-Supply of biogas plants and stoves
6. DOBEC	-Collect honey from member producers -Train on beekeeping	Dodoma Town	-Smallholder farmers trained in beekeeping	-Training to farmers in beekeeping and marketing

	-Promote marketing of bee products			
7. District council and Village Governments	- Support development activities - Maintain law and order	Mumi	-Viable development activities -Improved earning capacity of smallholder farmers -Sustainable environmental conservation	-Encourage smallholder farmers - Protect project assets

2.4 Project Goals

The current economic situation of the community is poor due to low agriculture productivity low soil infertile, poor farming methods and high dependency on sale of charcoal and firewood as their major sources of income. This project intended to improve the household income through increased agricultural productivity using environmentally friendly methods. In the process the project will build the income earning capacity improves livelihoods of smallholder farmers.

2.5 Project Objectives

The project aims at increasing productivity in agriculture through training and learning that will focus on creating general awareness and skills development.

The specific objectives are:

- (i) To organize and implement awareness creation program to the community by January, 2007,
- (ii) To train 100 farmers in environmentally friendly farming systems by January, 2008,
- (iii) To conduct training on group dynamics to 40 farmers (group leaders) by December, 2008 and,
- (iv) To organize one farmers' study tour to 40 group leaders by March 2009.

DONET had committed itself to mobilize the needed financial resources and backstopping of activities as part of its mandated functions.

2.6 Host Organization

DONET is the host organization for this project, which has taken liberty in contacting the community members and two groups as entry-points to the community. All relevant financial aspects of the project are under DONEY support.

The CED expert plays a technical facilitation and coordination role to various stakeholders of the project in collaboration with DONET coordinator.

2.6.1 Overview of DONET

The organization was founded in 1994 by a group of people who happened to show outstanding concerns about the severe environmental degradation in Dodoma region. The group members decided to join their efforts in order to raise awareness and involvement of the community members in environmental rehabilitation activities.

DONET serves individuals, institutions and Community-Based Organizations (CBOs) by educating and involving them in environmental conservation for sustainable development.

DONET is dedicated to serve the population of the whole Dodoma region, which has more than 1.5 million people and has, therefore, branch offices in all districts of Dodoma region. DONET is desirous to support the Mvumi community in reducing the effects of environmental degradation through sustainable agricultural production methods.

DONET's approach emphasizes to work with the community in identifying their problems and intervention measures and sharing with the community.

2.6.2 Organizational structure

The DONET's administration and organization structure is presented in Appendix 9.

It executes its activities through the following organs:

(i) Annual General Meeting (AGM)

It comprises all members of the organization and meets at the end of every calendar year. In this meeting, the members get plenary forum to be briefed and comment on the progress of the organization. The meeting makes key decisions and elects the executive committee as its right hand to make decisions and solve problems on its behalf.

(ii) Executive Committee

The committee meets quarterly to monitor the operations of the organization and to approve the progress reports and budget. The executive committee is accountable to the AGM.

(iii) The Executive Office

It constitutes coordinators, program officers, an accountant and a Secretary. The organization has also contracted three field workers to execute projects that are implemented by DONET. The supporting staffs for the office include a driver, a cleaner and a watchman.

(iv) CED Expert

The CED expert assumed a technical advisory role to the project in collaboration with DONET leaders.

2.6.3 Organization's vision, mission and core values

The following are the Vision and Mission statements of DONET.

(i) Vision: The vision of DONET is to have a society living in sustainably managed environment.

(ii) Mission: The mission of DONET is to promote environmental conservation in grass root communities through capacity building, networking, research, lobbying and advocacy for sustainable management of the environment.

(iii) Core values: In line with the vision and mission statements, the following values are core in DONET's life and are reflected in how it conducts itself and relates to others: respect, punctuality, voluntarism, co-operation, commitment, accountability, transparency and solidarity.

2.6.4 Organization goal

The main goal of DONET is to sensitize, educate and involve individuals, institutions and CBOs in sustainable environmental management. Specifically, in line with this goal, DONET conducts research with regards to effects of poverty on environment, appropriate and innovative ways that can enhance environmental conservation. Other are research on existing laws, policies and their application and effects on environment, resource use and allocation and effects of socio-cultural practices of communities on environment.

The aim is to generate enough information useful in enhancing its program strategies. Lobbying and advocacy for issues related to environmental conservation and resource use is another important aspect with regard to all areas of its engagement. In order to fulfill its mandates, DONET is committed to build the capacity of its members, staff and community on sustainable environmental conservation and enhance its institutional capacity.

2.6.5 Organization specific objectives

(a) To conduct research/studies on environmental issues

In line with this goal, DONET has set the following objectives: (i) To conduct research with regards to effects of poverty on environment. (ii) To conduct research with regards to appropriate and innovative ways that can enhance environmental conservation. (iii) To conduct research with respect to existing laws, policies and their application and effects on environment, resource use and allocation. (iv) To

conduct research on effects of socio-cultural practices of communities on environment.

(b) Lobbying and advocacy for issues related to environmental conservation and resource use

- (i) To use research findings on socio-cultural practices in lobbying and advocacy against practices that are detrimental to the environment.
- (ii) Lobbying and advocating for use of alternative sources of energy that are environmental friendly.
- (iii) Lobbying and advocating user-friendly laws and policies, and application of the same in environmental conservation, resource use and ownership.

(c) Building the capacity of DONET members, staff and community on Sustainable environmental conservation

In line with this objective, DONET has set the following:

- (i) Train community members on village Land Act.
- (ii) Train village committees on issues relating to water and soil conservation techniques.
- (iii) Train community members on better utilization of natural resources as per related policies/laws.
- (iv) Train DONET staff and members on communication skills in environmental conservation.
- (v) Create awareness on HIV/AIDS.
- (vi) Train village committees on issue relating to gender sensitization.

(d) To enhance the institutional capacity of DONET

In line with this objective, DONET has set to do the following:

- (i) Train members of DONET in environmental planning and management.
- (ii) Revise organization structure of DONET.
- (iii) Prepare and update administrative and financial procedures and systems.
- (iv) Establish documentation and resource centre of DONET.
- (v) Launch two local and three external financial initiatives.
- (vi) Enhance DONET management and administration

(e) Enhancing networking with stakeholders for sustainable environmental management

In line with this objective, DONET has set itself to do the following:

- (i) Establish a framework for networking with like-minded organizations.
- (ii) Strengthening district representative capacity.

CHAPTER THREE

LITERATURE REVIEW

This chapter is devoted to a survey of literature related to environmental conservation efforts and their likely impacts on livelihoods of people throughout the world. It gives the theoretical literature review as well as the empirical literature to see how practically the theory has been put into action, by referring to certain environmental policies, strategies and projects.

3.1 Theoretical Literature Review

3.1.1 People and the environment through history

People have always used and abused their environment. Early humans were happy to kill wild creatures and used other resources for food, and waste was simply discarded. The impact on the environment was extremely small, for the technology available to change the environment was very limited, and the total population of people was very low. Foskett and Foskett (1999) indicates that at the time of Christ the population of the world was approximately 50 million, compared to 6 billion by the end of twentieth century. At the same time the amount of energy consumed by each person for their daily life was only about 5% of that which is currently used. Concern about the environment and the damaging impact of human activity is thus a relatively new idea (Foskett and Foskett, 1999).

3.1.2 Conservation, development and the world economy

The growth of concern about conservation issues over recent decades has become entwined with questions about “Development”; both in the more wealthy countries of the West, known as developed countries (DCs) or more developed countries (MDCs), and in the poorest countries of the world known as less developed countries (LDCs). This is because environmental problems are often a by-product of economic growth. In more development countries, for example, the development of industry and transport has used natural resources prolifically and produced damaging air and water pollution. As economies have grown, so the amount of resources used and the pollution produced have increased (Foskett and Foskett, 1999).

As LDCs seek to expand their economies there is a risk of similar environmental problems arising. It is not just economic growth that can lead to environmental problems, though. While low levels of economic development may mean that communities are living in harmony with their environment, as shown by some of the native tribes living in the rainforests of the Amazon basin in Brazil, poverty, especially when combined with population growth, can lead to over-exploitation of fragile environments. Soil erosion and tree loss in some parts of LDCs may be the result of growing populations taking marginal land into farming, or clearing woodlands for firewood (Foskett and Foskett, 1999).

3.1.3 Environmental protection in Tanzania

The importance of environment in the economy of Tanzania is of four folds: it provides the basic resources for virtually all socio-economic activity in the country; it holds natural habitats, plants and animals that are part of an irreplaceable global heritage, waste receptacle and a foundation for eventual alleviation of abject poverty. It follows therefore that the major thrust of environmental management is protection of the natural living space of humankind and integration of environmental scarcity in making decision on all economic issues and activities (TNW, 2006).

The government of Tanzania realized the danger facing such resources including clean air, fossil fuels, fish and wildlife, hardwoods and endangered species by taking appropriate measures ranging from policy, legal framework and institutional arrangement which are conforming to socio-political and economic system (TNW, 2006).

The government in collaboration with various stakeholders has put emphasis on promoting, strengthening and sensitizing communities and individuals participation as a strategy to invigorate environmental conservation and management. Together with these there were awareness campaign, environmental education and skills development which complemented on various issues of environmental conservation and management. Emphasize for the environmental conservation and management is to raise the capacity and ability of the communities and individuals in sustainable management for own benefits and for the future generation. It is vivid that the effort has raised the public awareness, interests and actions as more than 159 Community Based Organizations

(CBO) and Non-Governmental Organizations (NGOS) have been formed as well as private sector and individuals joining the process. Furthermore, the government and other collaborating institutions and agencies such as CBOs / NGOs are implementing various program both in rural and urban areas. The media institutions (radio, TV, press, newspapers) have played a significant role in sensitizing and undertaking various education program on environmental issues thereby cultivating public / private interest, commitment and awareness on environmental management and conservation aspects (TNW, 2006).

The government adopted sector policies related to forest; mineral, wildlife; fisheries; agriculture and livestock and land which put priority on conservation and management of resources and environment, raising public awareness and understanding of the linkages between environment and livelihood, and promoting international co-operation on environmental agenda. Current interventions are directed in implementing the National Action Program to Combat Desertification, Biodiversity Conservation, environmental friendly production practices and abatement of pollution and strengthening both human resources and institution (TNW, 2006).

It is clear that current global, regional and national environmental conservation and management are aiming towards overcoming poverty-related problems, diseases, food insecurity and insufficiency, filth shelter, unsafe water, inadequate energy supply and unemployment (TNW, 2006).

Growing awareness of the general public and individuals on advantages of sound environmental conservation and management forms the basis for sustaining the resources and environment. This goes together with implementation of sound strategies on poverty eradication as poverty is highly tied with unsustainable resources utilization and environmental degradation and promotes joint gender efforts. Furthermore, the government has committed itself in environment conservation and management and poverty eradication with full support of individuals, CBOs, NGOs, and Donor Agencies (TNW, 2006).

3.1.4 Desertification

Desertification is the process which turns productive land into non- productive desert as a result of poor land-management. Desertification occurs mainly in semi-arid areas (average annual rainfall less than 600 mm) bordering on deserts. In the Sahel, (the semi-arid area south of the Sahara Desert), for example, the desert moved 100km southwards between 1950 and 1975 (Koohafkan, 1996).

Overgrazing and deforestation are the major causes of desertification worldwide. Plants of semi-arid areas are adapted to being eaten by sparsely scattered, large, grazing mammals which move in response to the patchy rainfall common to these regions. Early human pastoralists living in semi-arid areas copied this natural system. They moved their small groups of domestic animals in response to food and water availability. Such regular stock movement prevented overgrazing of the fragile plant cover and the use of firewood as the source of energy (Koohafkan, 1996).

In modern times, the use of fences has prevented domestic and wild animals from moving in response to food availability, and overgrazing has often resulted. However, when used correctly, fencing is a valuable tool of good veld management (Koohafkan, 1996).

The use of boreholes and windmills also allows livestock to stay all-year round in areas formerly grazed only during the rains when seasonal pans held water. Where not correctly planned and managed, provision of drinking water has contributed to the massive advance of deserts in recent years as animals gather around waterholes and overgraze the area (Koohafkan, 1996).

Other human activities that contribute to desertification include:

- (i) Cultivation of marginal lands, i.e. lands on which there is a high risk of crop failure and a very low economic return, for example, some parts of South Africa where maize is grown.
- (ii) Destruction of vegetation in arid regions, often for fuelwood.
- (iii) Poor grazing management after accidental burning of semi-arid vegetation.
- (iv) Incorrect irrigation practices in arid areas can cause salinization, (the build up of salts in the soil) which can prevent plant growth.

When the practices described above coincide with drought, the rate of desertification increase dramatically (Koohafkan, 1996).

Increasing human population and poverty contribute to desertification as poor people may be forced to overuse their environment in the short term, without the ability to plan for the long term effects of their actions. For example, where livestock has a social importance beyond food, people might be reluctant to reduce their stock numbers; thus predisposing to overgrazing and ultimately land degradation (Koohafkan, 1996).

3.1.5 How widespread is desertification?

About one third of the world's land surface is arid or semi-arid. It is predicted that global warming will increase the area of desert climates by 17% in the next century. The area at risk to desertification is thus large and likely to increase. Worldwide, desertification is making approximately 12 million hectares useless for cultivation every year. This is equal to 10% of the total area of South Africa or 87% of the area of cultivated lands in Tanzania (Koohafkan, 1996).

During early 1980s it was estimated that, worldwide, 61% of the 3257 million hectares of all productive drylands (lands where stock are grazed and crops grown, without irrigation) were moderately to very severely desertified. The problem is clearly enormous (Koohafkan, 1996).

3.1.6 Causes of desertification

The causes of desertification can be divided into two categories; direct and indirect. The direct causes include over cultivation of the land, deforestation, overgrazing, mismanagement of irrigated crop land, and population increase with its inevitable demands for a number of basic needs, such as food, shelter and firewood (Negal, 1994).

The indirect cause of desertification include drought, poverty, ignorance, unplanned migration patterns, inappropriate and destructive land use practices, uncontrolled bushfires, anarchic settlement programs, encroachment of agricultural land onto fragile pastoral rangeland. Others are greed, social and economic changes and misguided government policies. This division of the causes into direct and indirect does not mean those which are grouped under direct causes have more weight than those which are classified under indirect causes. The two types of causes reinforce one another in accelerating tempo of the desertification process (Negal, 1994).

3.1.7 Effects of desertification

Desertification reduces the ability of land to support life, affecting wild species, domestic animals, agricultural crops and people. The reduction in plant cover that accompanies desertification leads to accelerated soil erosion by wind and water. South Africa is losing approximately 300-400 million tones of topsoil every year due to soil erosion. As vegetation cover and soil layer are reduced, rain drop impact and run-off increases. Water is lost off the land instead of soaking into the soil to provide moisture for plants. Even long-lived plants that would normally survive droughts die. A reduction in plant cover also results in a reduction in the quantity of humus and plant nutrients in the soil, and plant production drops further. As protective plant cover disappears, floods become more frequent and more severe thus triggering the desertification process (Koohafkan, 1996).

Desertification is self-reinforcing, i.e. once the process has started, and conditions are set for continual deterioration (Koohafkan, 1996).

3.1.8 Strategies for arresting desertification

One of the greatest impediments to the socio economic development of societies in Sub-Sahara Africa, indeed to the very survival of a good many of them as nation-states, is the loss of fertile top soil through erosion and the disappearance of vegetative cover through deforestation ultimately resulting in desert like conditions (Negal, 1994).

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

3.1.9 Background to the environmental problems facing Tanzania

Tanzania covers an area of 945,000km² and is one of Africa's most ecologically rich countries. The diverse climatic and physical conditions range from arid, semi-arid, and mountainous areas of afro-alpine vegetation, woodland and dry land savanna. About 40% of Tanzania is covered by forests and woodlands, which host various types of ecosystems. Tanzania's eastern coastline extends about 240km north to south along the Indian Ocean. Additionally, there are several lakes, rivers and swamps, which contain diverse types of aquatic life (*LEAT, 2007*).

Presently, the best agricultural lands in the country are densely populated which in turn results into their degradation, making the soil unfit for cultivation. Deforestation, which is taking place at an alarming rate, has augmented the magnitude of desertification and adversely affected soil fertility, water catchment areas and water flow. Discharge of untreated effluent continues to pollute the ocean, lakes and rivers, thus making water unfit for human consumption and destroying the aquatic habitats (*LEAT, 2007*).

The National Environmental Policy identifies six major environmental problems, which require urgent attention. These are: (i) loss of wildlife habitats and biodiversity; (ii) deforestation; (iii) land degradation; (iv) deterioration of aquatic systems; (v) lack of accessible, good quality water; and (vi) environmental pollution. Further, the Government of Tanzania (GOT) admits, in this policy, that the country needs to adopt environmentally sustainable natural resource management practices in order to ensure that long term sustainable economic growth is achieved (NEP: 1997). It can therefore be

concluded that, the country's long-term economic growth is dependent among other factors, upon its coherent natural resource management (*LEAT, 2007*).

Accordingly, the GOT has formulated a number of policies, enacted pieces of legislation- principal and subsidiary and established various institutions to facilitate and carry out its duty to protect and manage the country's environment. Local government authorities are to protect and manage the environment in their respective areas of jurisdiction (*LEAT, 2007*).

3.1.10 Major environmental problems in Tanzania

3.1.10.1 Land degradation

Human impacts on deforestation, soil erosion, overgrazing, and degradation of water resources and loss of biodiversity have all resulted into land degradation. Poor agricultural practices such as shifting cultivation, lack of crop rotation practices, lack of agricultural technology and land husbandry techniques exacerbate the problem (*LEAT, 2007*).

The effects of overstocking, which are localized, gave rise to serious degradation in places such as Shinyanga and Mbulu areas in Tanzania where livestock units have exceeded the carrying capacity. This situation is seen as a good indicator of the capacity for the decentralized institutions at the local level to enforce laws and instruments which are meant to ensure sound environmental management (*LEAT, 2007*).

3.1.10.2 Pollution management and urbanization

Pollution is a major problem in urban areas of Tanzania. Improper treatment and disposal of solid and liquid wastes are the major contributors to urban area pollution. The combined results of these problems are that both air and water have been contaminated with pollutants, which are detrimental to human health. In Dar es Salaam, for example, less than 5% of the population is connected to a sewage system. Where a sewage system exists, raw sewage is discharged directly into the Indian Ocean without prior treatment. Thus a workable water supply and sewage treatment is needed for the urban areas (*LEAT, 2007*).

3.1.10.3 Agricultural and range land resources management

Agriculture and rangeland resources are the backbone of Tanzania's economy. It is estimated that about 55% of the land could be used for agriculture and over 51% for pastoral lands. However, only about six percent of the agricultural land is cultivated with the practice of shifting cultivation which causes deforestation and land degradation on the pastoral land. Lake Manyara basin, Geita Gold Mines, Usangu Wetlands and Ngorongoro Conservation areas have been affected the most by inadequate control and land management (*LEAT, 2007*).

The main cause for these problems is due to lack of proper instruments of enforcement of the existing legislation, policy and by-laws by local authorities. Again where the mandates of central and local institutions on environmental management are weak,

conflicting and confusing; enforcement of laws and implementation plans becomes difficult if not impossible (*LEAT, 2007*).

3.1.10.4 Management of forest resources

Forest resources provide both direct products and by-products. The forest reserves are also linked with agriculture, beekeeping, energy, water uses and biodiversity. It is estimated that fuel wood and agricultural residues account for 92% of the total energy consumption in the country. As a result, the mismanagement of fuel resources significantly contributes to deforestation and environmental degradation. Hence, highlighting the central and local governmental institutions inability to solve the problem (*LEAT, 2007*).

3.1.10.5 Management of wildlife resources

Tanzania is one of the few countries with vast number of wildlife resources. For example, Tanzania's "protected areas" cover about 25% of the total land. The protected land is comprised of national parks, game reserves, game controlled areas and the Ngorongoro Conservation Area. Unfortunately, and communities living around these protected areas do not benefit from the wildlife industry. They live in uncertain conditions visited by persistent attacks by the wild animals and destruction of their crops. This has resulted in an antagonistic relationship between the wildlife authorities and the local populace. Local communities resort to activities like poaching to gain access to and benefits from the wildlife and other natural resources. This is a direct result

of the central government excluding local communities from wildlife management (*LEAT, 2007*).

3.1.10.6 Management of mineral resources

With respect to mineral resources, a Joint Appraisal Mission Report (1999) noted conflicting authorities on matters regarding mineral prospecting and mining. Additionally, local authorities have a minimal role in the mineral resource management process, despite the fact that mineral depletion is occurring in the local communities' area. Any attempts made by local authorities to make by-laws imposing mineral levy such kind of by-laws have been met with an "outcry of double taxation" by mineral concessionaires against both the central government and the local authorities (*LEAT, 2007*).

The Tanzanian economy depends upon mineral resources for a major source of its revenues. However, mineral exploitation is often done without regard to environmental and social impacts. Thus, the Mining Act of 1998 addressed this problem and required mining companies to conduct environmental impact assessments. Mining activities a major cause of environmental degradation by deforestation, destruction of habitat, loss of biodiversity and general damage to the land (*LEAT, 2007*).

3.1.11 Environment and development

The reality of environment and development are closely related. On one hand, an environment provides natural resources for the process of development. On the other hand, the development process modifies the natural resources and environmental quality

to meet human needs. The goal of both environment and development is the same that is to improve the human wellbeing. However, the type of development adopted can cause problems that destroy the environment that sustains it and lowers the quality of life which it attempt to enhance. If the present and future generation is to be assured of quality living, the development must be sustained by the environment and must in turn, not destroy environmental resources (Muthoka, 1998).

3.1.12 Poverty and environment

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

3.2 Empirical Literature Review

A research done by Tweve (2004) found that, apart from planting trees MRECA had been supportive in making sure that natural forest were protected and conserved by harmonizing villagers and traditional leaders on conserving their natural wealth as a major source of rain in Mbeya and Rungwe Districts.

The local community had been potential partners in sustainable management of forest resources although land and tree tenure on communal and public lands was not clear, particularly for indigenous trees.

Apart from the performance revealed in his study the researcher recommended that, there was a need to enhance understanding of villagers needs and perspectives though the development and application of new social science approaches. The existing system of exploiting resources had been wasteful, for example local timber saw which was operated by human power had been losing about 20 to 30% of timber product as garbage. The program had introduced new technology to support timber producers in order to enhance sustainable environmental management of the Ruaha river forest (Mtweve, 2004).

According to IRADEP environmental degradation is causing increased demand for more cropping land due to shifting cultivation and increased population pressure. This in turn has an effect of increasing demand for fuel wood and charcoal. IRADEP calls for immediate measures to control environmental degradation for sustainable development (Mpangala, 2004).

In West Usambara, north East Tanzania Soil Erosion control and Agro-forest Project (SECAP), villagers were given a say in drawing up the plans as these would have been impossible to be implemented unless the majority of the local people felt motivated and involved (Kerhof, 1990).

Local Authorities were also responsible for mobilizing people in protecting their environments by establishing specific by- laws and preparing land-use plans.

In assessing the role of local government authorities in environmental conservation in Tanzania, Pangani found that, the Nkasi district council did not have formal land- use plans to guide and help in the management of natural resources. The absence of land use plans had led to the problem of rampant harvesting of trees for various uses resulting into environmental degradation. The study also found that there was inadequate by-laws enforcement by Local Government Authority for effective environmental conservation evidenced by a small number of cases presented to Local Government officials. Most of cases were resolved locally among concerned parties. Therefore, the villagers had continued with their old practices of burning bushes, cultivating around water catchments areas, and steep slopes, and living their livestock to roam about in residential areas.

Furthermore, she found that the Nkasi district had no comprehensive plan on environmental conservation particularly on afforestation. Since its establishment, Nkasi District Council had not allocated any funds for environmental conservation purposes from its collected revenues, despite the fact that revenue collection was done every year from natural resources. There were also no efforts to replenish the harvested or destroyed resources through poor farming practices, rampant harvesting of forest products, and uncontrolled bush fire (Pangani, 1995).

She recommended that, the Nkasi district council should allocate a reasonable budget from its revenue, design strategies of raising funds for conservation of forests in all wards and introduce improved cooking stoves to reduce tree cutting for energy consumption and encourage the use of renewable sources of energy such as biogas and solar energy (Pangani, 1995).

The Hifadhi Ardhi Dodoma (HADO) provides another experience on how to manage environmental projects sustainably. The objectives of HADO as stipulated by the 1973/74 - 1981/82 Master Plan were, (i) to ensure that people in Dodoma Region are self-sufficient in wood requirements, (ii) to encourage communal wood growing schemes in the region, to promote ujamaa and communal bee-keeping activities, (iii) to encourage the establishment of shelter belts or windbreakers, shade, avenue and fruit tree growing, and (iv) to conserve soil and water and to reclaim depleted land.

Before this program started it was found that deforestation rate was over 20,000ha/year, overstocking started to exceed 40% and burning had led to the wide scale devastation of land resources. Faulty agricultural practices, human population pressure, and harsh environmental factors (mainly rainfall erosivity and soil erodibility) had enhanced land degradation (HADO, 1986)

To prevent further land degradation and to reclaim eroded land, HADO had to adopt several approaches including engineering, forestry, protective and institutional measures. In most cases, these measures have been applied in combination although each is serving a separate purpose.

Construction of bunds along contours and across incipient gullies together with the establishment of vegetation had been applied to promote sediment deposition, increase infiltration, and reduce surface runoff and to provide a more stable soil surface for plant growth; 11,365ha have thus been treated.

3.2.1 Conservation efforts in Tanzania

Conservation efforts in Tanzania have been applied since time immemorial. During colonial era efforts were hampered by the non-involvement of the local community. After independence some failures were attributed by wrong policy decision, lack of follow-up and community participation (Tweve, 2004).

3.2.2 The National Environment Management Council (NEMC)

National Environment Management Council (NEMC) was established by an Act of Parliament No.19 of 1983 to perform an advisory role to the government on all matters relating to environment management. To respond to the role, NEMC mandates subscribe to functions of promoting, catalyzing overseeing and co-ordination of all issues pertaining to the environment. Its vision is; to provide technical leadership for the application of environmental practices for sustainable development.

NEMC is the leading technical advisory, coordinating and regulatory agency responsible for the protection of the environmental and sustainable use of the natural resources in Tanzania.

It is responsible in consultation, collaboration and partnership with other entities concerned with environmental matters and the public at large, for facilitating and promoting such measures as necessary to help achieve an important quality of lives for Tanzanians.

3.3 Policies and National Strategies Review in Tanzania

There are a number of policies and strategies that focus on sustainable environmental and economic development.

3.3.1 Policy review

The National Environmental Policy (URT, 1999) provides a framework for making fundamental changes that are needed to bring environmental considerations in to the main stream of decision making in Tanzania. The objectives of National environmental policy include.

- i. To ensure sustainability/ security and equitable use of reassures for meeting basic needs of the present and future generations without degrading the environment, or risking health or safety;
- ii. To prevent and control degradation of land, water, vegetation and air which constitute the essential life support system;
- iii. To ensure and enhance nature and man-made heritage, including the biological diversity of the unique ecosystem of Tanzania;

- iv. To improve the condition and productivity of degraded areas including rural and urban settlements in order that all Tanzania may live in safe, productive and aesthetically pleasing surrounding, care basic shelter, food security, access to secure tenure and infrastructure;
- v. Generation of social -demographic information and mitigation of the direct and induced effects of demographic change, on the environment, with respect to critical resources such as land water and ecosystem health, taking account of community needs.
- vi. Promote awareness of the critical role of women on population and environmental issues through increased access to education and expanding primary and productive health care programmes to reduce maternal and infant mortality;

National Environmental Policy (1997) - underlining the link between the lives of Tanzanians and the environment and Poverty reduction strategy - showing a close relation between poverty and environment degradation and therefore focusing on satisfaction of basic needs as one of the means towards protecting the environment.

The National Land Policy (1995) and the Village Land Act (1999) - establishes a link between fair land tenure system and optimal as well as sustainable use of land.

The Forest Policy (1998) underscores the contribution of the forest sector to the sustainable development in terms of ensuring - sustainable supply of forest products,

ecosystem stability through conservation of forest biodiversity, and allocation of forests and their management.

The National Beekeeping Policy (1998) - seeks to enhance sustainable contribution of the sector to socio-economic development and environmental conservation.

It is evident that, the above stated policies call for an integrated land use planning, dependable access to land resources, and the rights of participation and education in their implementation as basic cross-sectoral principle for environmental management. The major responsibilities of government institutions and NGOs at this level are to assist the local communities to become aware of their own situation and support them to become responsible for their own destiny.

3.3.2 National strategies

The National Conservation Strategy for Sustainable Development - emphasizes sustainable use of natural resources, citing land degradation as the main issues to be addressed, and underscoring participatory approach in the whole matter of conservation.

Introduction of national forest program was among efforts by government to address the challenging responsibilities in the near future and to increase the forest sector contribution to the national economy and poverty reduction. The program aimed at addressing the degradation of forest land through other land uses and man made disasters, illegal harvesting, encroachment including how to conserve the capacity of

forests as water catchment areas for water supply and production of hydropower and unique biodiversity areas in different eco-zones.

Poor people rely heavily on natural resources (land forests and water) and are most vulnerable to external shocks and environmental risks, including drought and floods. It is important to check over-exploitation of natural resources and environment degrading (URT, 2005).

The literature review establishes a gap that exists between national policies and the actual practices by communities at grass root. Therefore there is the need to bridge a gap by adopting those interventions that empower local communities to solve their environmental and economic development problems at local level.

CHAPTER FOUR

IMPLEMENTATION

This section provides both the original plan and the actual implementation, and reports what was accomplished in this project. It summarizes the project planning in terms of products, outputs, inputs and activities that were needed to achieve the set goals. Project Implementation plan and Gantt chart are also detailed in this chapter.

4.1 Project Outputs

The major outputs:

- (i) A long – term environmental education program will have been launched.

This will focus on the general awareness creation to the smallholder farmers on the causes of environmental degradation and the ways to prevent this. Experts from the natural resources department and DONET will facilitate this.

The environmental education will be disseminated through distribution of printed materials such as posters, calendars and leaflets. Also the use of performing arts groups based on the villages will be made.

- (ii) Training programs to community members will be conducted focusing on major areas:-
 - Environmentally friendly farming methods and animal husbandry
 - Livestock Development Officers, Agriculture Officers, Cooperative Officer and Community Development Officers will play a key facilitation role.

- (iii) Tree nurseries will be established to supply tree seedlings in the area. Small farmer groups and individuals will be encouraged to establish their own nurseries.
- (iv) Cattle improvement program for local breed through cross-breeding livestock officers will facilitate in this process.
- (v) Study tours for farmers to areas with proven achievement within the country or outside the country for them to learn. DONET is expected to play a key role in identification of the study areas and countries.

4.2 Logical Framework

The project follows intervention logic to achieve the expected goal of increased income. Immediate results of the activities include increased land under conservation agriculture, increased number of smallholder farmers practicing sustainable farming methods, and increased number of hectares planted with trees.

The implementation of this project focuses on long term and short term measures. In the long term, environmental education program is to be launched for general awareness of the public. In the specified time period, training programs on environmentally friendly methods, establishment of tree nurseries, cattle improvement, and study tours are foreseen. Table 15 shows the planned Logical Frame Work.

Table 15: Logical Framework of the Project

Goal	Income for smallholder farmers improved	Objectively verifiable indicators	Sources of verification	Assumption
		Total income of smallholder farmers improved by 40% between 2006 – 2009 in Mvumi.	- Evaluation report	-Favourable weather conditions -Stable agricultural policy
Objective	Increased agricultural productivity for smallholder farmers	<ul style="list-style-type: none"> • Maize output per acre increased from current 4 to 8 bags by 2009 in Mvumi • Milk production increased from 1 litre to 3 litres per day per cow by 2009 in Mvumi 	- Project progress report - Implementation report of the Department of agriculture and Livestock	-Favorable weather conditions -Smallholder farmers' participation
Results (output)	-Increased land under agriculture -Increased number of smallholder farmers who use recommended farming methods -Increase number of planted trees	<ul style="list-style-type: none"> • Land under conservation agriculture increased from 80 hectares to 400 hectares by 2009 in Mvumi. • Number of smallholder farmers using recommended farming methods increased from 20 to 1000 by 2009. • Number of hectares with planted trees increased from 5000 to 20,000 by 2006 	- Project Progress report. - Village development report.	-Willingness of smallholder farmers to participate
Activities	-To organize education programme for smallholder farmers on environmental protection. -To train smallholder farmers on environmental friendly crop and animal husbandry -To conduct trainings on group dynamics. <ul style="list-style-type: none"> • To prepare tree 	<ul style="list-style-type: none"> • Printed materials on environmental conservation are available • About 100 farmers and 40 leaders trained - Three nurseries and one	- Implementation report - Training report	- Community participation -Willingness of smallholder farmers to participate

		Objectively verifiable indicators	Sources of verification	Assumption
	nurseries and demonstration plots of sustainable agriculture <ul style="list-style-type: none"> • To facilitate availability of improved breeds (cattle) • To conduct farmers study tours • To monitor and evaluate progress 	demonstration plot prepared <ul style="list-style-type: none"> - Two improved breed bulls purchased - one study tour conducted 	<ul style="list-style-type: none"> - Implementation report - Evaluation report 	<ul style="list-style-type: none"> - Availability of enough land and improved breed bulls <p>Willingness of smallholder farmers to participate effectively in project activities.</p>

4.3 Implementation Plan

The beneficiaries were directly responsible for the implementation of the project under the support of the project Manager and DONET Coordinator. Other extension staffs were expected to play important expert roles in their areas of specialty as indicated below in Table 16.

Table 16: Implementation Plan of the Project:

	Objective	Activities	Year			Resources Needed	Person Responsible
			2006	2007	2008		
1.	To organize environmental education programme	• Prepare relevant learning materials	■			• Environmental experts • Money(funds)	DONET Coordinator
		• Conduct the program				Facilitators	Project Manager
2.	Training on environmental friendly crop and animal husbandry	• Contact the facilitators and prepare training materials	■	■	■	• Agricultural Officer • Facilitators • Stationeries	DONET Coordinator Project Manager
		• Conduct the training				Facilitators	Project Manager
3	Training on Group dynamics	• Prepare Training Materials				Facilitators	Project Manager
		• Facilitate the training	■	■	■	Facilitators	Project Manager
4.	Preparation of tree nurseries and agriculture demonstration plots	• Collect relevant soils and tree seeds	■	■	■	Foresters transport Tree Seeds	Project Manager
		• Prepare nurseries and take care of seedlings		■	■	• Foresters • Watering canes	Project Manager
5.	Introduction of Improved cattle breeds	• Identify sources of bulls	■			Livestock officer	Project Manager
		• Cross breed with local breeds		■	■	Livestock officer	Project Manager
6.	Organize farmers study tours	• Contact visit areas			■	CDO, District and Agriculture and Livestock Development officer	Project Manager
		• Facilitate study tour				Transport	
7.	Monitoring						DONET Coordinator Project Manager
8.	Evaluation		■	■	■	External evaluator	DONET coordinator

4.4 Status of Implementation

The implementation of the project started in November 2006 by introducing the project to the community and other stakeholders through sensitization meetings and workshops. Preparation of education materials was delayed due to mobilization of funds by DONET, although relevant experts had been identified. DONET failed to secure in time its promised assistance from donors. This had subsequently affected its capacity to support implementation of this project. The status of project implementation is given in table 17.

Table 17: Status of implementation

Objective	Activities	Planned date	Responsible	Status/ Remarks
1.To organize and implement environmental education program to the community	-Organize stakeholder Workshop	Nov.2006	DONET coordinator	Done
	-Identify and contact environmental experts	Nov.2006	DONET coordinator	Done
	-Preparation of production materials by experts	Dec.2006	DONET coordinator	On progress
	-Identify and train relevant facilitators	Jan.2007	DONET coordinator	Expected to be done
2.To train farmers on environmentally friendly farming systems	-Identify and contact relevant facilitators	Nov. 2007	DONET coordinator and Project officer	Expected to be done
	-Identify and contact farmers for training	Dec.2007	DONET coordinator and Project officer	Expected to be done
	-Contact training	Jan.2008	DONET coordinator and Project officer	Expected to be done
3.To organize a training programme for farmers on group dynamics	-Facilitate the preparation of training materials	June,2007	DONET coordinator and Project officer	Expected to be done
	-Identify and contact trainers on group dynamics	Dec.2008	DONET coordinator and Project officer	Expected to be done
4.To organize farmers' study tours	-Identify visit areas	Dec.2008	DONET coordinator and Project officer	Expected to be done
	-Facilitate study tour	March,2009	Project officer and group leaders	Expected to be done

Results in table 17 show that, very few of planned activities have been implemented so far, partly because it is still a new project and, partly due to limited funds obtained from DONET. Mobilization of funds is on progress to allow effective implementation of activities in 2007/08.

4.5 Project Cost

The project was expected to cost Tsh. 91,100.00/= excluding the community contribution in terms of participation in activities such as preparation of nurseries, acquisition of land (it assumed that land will be provided freely) and time spent in implementation.

The expenditure items which reflect the total project cost include printing of education materials; allowances to facilitators; acquisition of improved breed bulls; transport and study tour expenses. The breakdown of the estimated budget is summarized in Table 18.

Table 18: Project Budget

NO.	OBJECTIVE	ACTIVITIES	COST (T.SHS) IN THOUSANDS			TOTAL T.SHS.'000'
			YEAR 1	YEAR 2	YEAR 3	
1	Organize Environmental Education Program	Prepare learning materials	3,000	1,500	1,500	6,000
		To distribute and organize meeting	500	1,000	1,000	2,500
2	Training on Environmental friendly practices	To prepare training materials	3,000	1,000	1,000	5,000
		To facilitate trainings	2,000	4,000	3,000	9,000
3	Training on Group dynamics	To prepare training materials	1,000	200	200	1,400
		To facilitate training	2,000	3,000	4,000	9,000
4	Preparation of tree nurseries and demo plots	To collect relevant soils and seeds	2,000	200	-	2,200
		To prepare demo plots/nurseries	5,000	1,000	-	6,000
		To take care of seedlings	3,000	200	1,000	4,200
5	Improved cattle breeds	To contact bull canterers for identification	1,500	-	-	1,500
		To assist farmers in cross breeding	300	1,000	1,000	2,300
6	Farmers study Tours	To contact study tour areas		1,500	1,500	3,000
		To facilitate study tours		4,000	4,000	8,000
7	Monitoring	Transport and Lunches	6,000	8,000	9,000	23,000
8	Evaluation	External evaluator	-	-	8,000	8,000
		TOTAL	29,300	26,600	35,000	91,100

CHAPTER FIVE

MONITORING, EVALUATION AND SUSTAINABILITY

This chapter presents the monitoring and evaluation framework for the project. The importance of monitoring and evaluation as key concepts in any project development is underscored. It outlines key activities to be monitored and corresponding monitoring methods; monitoring questions and important monitoring indicators and tools. Evaluation is also discussed in terms of information needed, source of information and methods to be employed. The project sustainability is discussed in terms of financial and policy relevance.

5.1 Monitoring

5.1.1 Objective of monitoring

The main objective of monitoring is to determine whether the activities are progressing as planned and leading towards attaining objectives of the project. This could ensure early adjustments of the project activities where necessary.

Table 19 presents logical sequence for the systematic project monitoring. The table summarizes the list of activities planned to be monitored (derived from the plan), time duration for each activity to be completed and the methods planned to be used in monitoring the activities. The table also shows the measure of progress, anticipated barriers and their solutions.

Table 19: Project Activities Monitoring

Activities	Duration	Methods	Current Progress	Barriers	Solutions
1. Introduce the project to the community.	First two months of the first year	Review on the group meetings minutes	-official courtesy call and other processes. Stakeholder workshop organized.	Negative perception by some people	Ensure provision of information on project implementation to the community
2. Organize and implement environmental education program to the community	First year	Review the agreement with the environmental experts -Review the community meetings minutes	-Contacts with environmental experts. -Community meetings conducted	Shortage of funds.	-DONET to set aside the needed money -Moderate allowances to facilitators
3. Train farmers on environmentally friendly farming systems	2 nd , and 3 rd , year	-Review the training material -Review the trainees register	Not done	Possibility of poor retention of the skills due to lack of education	Encourage farmers for more practical participation
4. Organize a training program for farmers on group dynamics	2 nd , and 3 rd , year	-Review the training materials -Review the trainees register	Not done	Possibility of poor attendance of participants	To use different ways of creating awareness and mobilizing people.
5. Organize farmers' study tours	3 rd year	Area visiting and preparing participants for study tour	Not yet done	Possibility of poor participation of farmers if it is very far away	To motivate farmers to participate.

The Table Format Source: Gajanayake (1993)

5.1.2 Indicators and means of verification

Table 20 shows indicators and tools for monitoring the project activities.

Table 20: Indicators and Tools

S/No.	Activities	Direct indicators	Indirect Indicators	Means of verification
1.	Prepare relevant learning materials	-Learning materials prepared -Receipts available.	-	Procurement records
2.	Conduct the program	-Correspondence letters -Implementation report	-	- Program records (files, reports)
3.	Contact the facilitators and prepare training materials	-Correspondence letters - Number of facilitators -Availability of training materials	-	Procurement records
4.	Conduct the training	- Number of participants -Training materials	understanding level of the participants Improved	-Training reports
5	Prepare nurseries and take care of seedlings	-Number of trees planted -Tree survival rate -Nursery existence	-	-Group discussion. -Minutes of the group meetings. -Observation
6	Cross breed with local breeds	Number of local cattle breed serviced	Improved breed	-Observation - expert reports
7	Facilitate study tour	-Area visited -Number of participants	-	-Study tour report -Physical inspection

5.1.3 Monitoring questions

The following are some of the relevant questions asked to different stakeholders involved in the project implementation. The questions cover key monitoring result areas of the project.

- (i) How much money was spent in different activities as compared to the original plan? Was the money used as planned? If not, why and what should have been done?
- (ii) Were the training conducted as planned? How many participants attended? Gender balance? What did they learn? Was it of help to them? What changes can be seen which are attributable to the trainings? What more do they need? Who facilitated the training? Were the facilitators effective and efficient?
- (iv) How many tree nurseries established? Who were involved? What services provided to farmers?
- (v) How many leaflets, calendars and posters on environmental education produced. Who were involved and how?
- (vi) How many farmers get services for improved breeds of cattle? How many are practicing conservation agriculture? Any evidence of zero grazing? How many study tours done? Who participated and where? What lessons learnt?
- (vii) Is there any evidence of increased income for farmers?

5.1.4 Monitoring team

The monitoring team consists of two members from DONET, two experts (an environmentalist and agricultural officer) and the community representatives (Smallholder Farmers).

5.1.5 Type of data collected

Data to be collected in this exercise include: amount of resources used and not used, number of members attended the environmental training and study tour, number of environmental training conducted and type of improved cattle breeds and breeds adopted, time used for various activities, amount and type of materials prepared. Such data can be categorized as time related, financial, human and material.

5.1.6 Monitoring study methods

A number of methods were employed to collect monitoring data as indicated below:

(i) Documentary review

Review of documents including DONET meeting minutes, corresponding letters, training manuals and registration book for workshop participants was done to identify whether stakeholders workshops was conducted as planned. Identification of environmental experts was done properly and preparation of production of training materials was implemented as planned. Focus on type of trainings and contents delivered, who were the facilitators, number of participants and their potential for implementing the training in their daily life, was obtained from documents such as training reports, correspondence letters, training materials, and plan documents.

The findings from this exercise enlightened the monitoring team on whether activities done on the ground were in line with the plan and the procedures needed so that in the future, the implementation process is properly guided.

(ii) Interviews

Interviews were conducted to DONET coordinator, project beneficiaries and project staff so as to obtain information concerning the progress of the project. A checklist of questions was used to guide the interview in which the DONET coordinator, smallholder farmers and ward leaders will be purposively chosen. This aimed at obtaining information from individuals through face to face conversation.

This method provided an opportunity to compare between what is done, with what was originally planned as evidenced from the documentary method. Where there was no match between planned and actual implementation; immediate advice was given to avoid possible implementation bottlenecks.

(iii) Observations

In order to ascertain progress made by implementing various project activities as reported through reports and interviews to stakeholders; a physical visit to the sites to observe things on ground was carried out. This method enabled the monitoring team to obtain information on availability or evidence of use of recommended farming systems, availability and use of energy saving stoves, types and number of trees planted, nurseries established, availability of improved breeds, and amount and type of produced environmental education materials.

5.1.8 Monitoring results

Monitoring conducted for initial activities of the project revealed that the organization of the stake holder's workshop was done properly as planned for 10 participants. 10 stakeholders were contacted already for the workshop and promised to attend the workshop.

The experts for facilitating the workshop were contacted and promised. Three experts were identified in which two are from the District Agricultural and Livestock Department and one from the District Natural Resource Department.

Training of farmers on environmental friendly farming system was shifted to July 2007 due to lack of funds. Other activities also were shifted to year two of the project on the same reasons. These activities are as follow:

- (i) Identifying and contacting farmers for study tour,
- (ii) Preparation of the training materials
- (iii) Training of farmers and livestock keepers
- (iv) Conducting evaluation

5.2 Planned Evaluation

The evaluation was to be conducted to assess the impact of the project and the extent to which the project objectives were achieved. This was intended to help in either redesigning the project or designing another (new) project in line with the available facts.

The evaluation will also focused on whether the objectives were achieved within a specified time frame and resources. The terms of reference for evaluation were drawn to enable measurement in the five criteria of evaluation: relevance, effectiveness, efficiency, impact and sustainability.

5.2.1 Dimensions of project evaluation

It was planned that one evaluation to be conducted at the end of third year of the project implementation. The evaluation was to focus on whether all the project activities were implemented as planned: the environmental education program, environmental training, group dynamics, and adoption of improved breeds/seeds and farming methods.

A summary of criteria used in evaluation is shown in Table 21.

Table 21: Project Evaluation Worksheet

Goal/Objectives to be achieved	Activities needed to be performed	Information needed	Information Sources	Methods/ Techniques
Environmental education program successfully implemented	<ul style="list-style-type: none"> -Conducting of community meetings -Production and distribution of relevant information materials (posters, brochures, calendars) 	<ul style="list-style-type: none"> -Number of sensitization meetings conducted -Type and amount of learning materials produced -Content of the education materials -Points of distribution and replacement of materials 	<ul style="list-style-type: none"> -Monthly , quarterly and Annual reports -Sample materials available -Knowledge by smallholder farmers and other stakeholders 	<ul style="list-style-type: none"> -Documentary review -Interviews -Discussion -Observations
Smallholder farmers trained in specific skills to enhance improved performance	<ul style="list-style-type: none"> -Environmentally friendly farming systems -Training on Group dynamics -Tree nurseries preparation - cross breeding of Livestock 	<ul style="list-style-type: none"> -Number and type of trainings -Facilitators competence -Number of smallholder farmers trained -Number of tree nurseries prepared -Availabilities of improved breeds 	<ul style="list-style-type: none"> Implementation reports Information from smallholder farmers 	<ul style="list-style-type: none"> -Review of reports -Interviews -Observations

Explore whether capacity enhancement of smallholder farmers improved agricultural productivity in the area	Conduct evaluation of the project	<ul style="list-style-type: none"> -Yield of maize, grapes per hector -Improved livestock breeds -Current farming system/methods -Use of improved stoves 	District Agriculture, Livestock and cooperative offices -Sample selected from the community	<ul style="list-style-type: none"> -Interviews -Review group records -Informal discussions
Explore whether the capacity enhancement of smallholder farmers for environmental conservation project improves living standard of smallholder farmers	Conduct household income survey	Different purposes the project is serving on environment e.g. improving agricultural productivity and sensitizing community on tree planting and the use of improved farming systems	-Formal and informal leaders.	<ul style="list-style-type: none"> -Interviews, -Review of documents, -Informal discussion, -Review the records on tree planted -Observations

The Table Format Source: Gajanayake (1993)

5.2.2 Evaluation questions

The following questions will be needed to solicit relevant evaluation information:

- (i) Have the smallholder farmers' adopted improved farming methods?
- (ii) How many smallholder farmers improved their agricultural productivity as a result of this project?
- (iii) Are the smallholder farmers' income improved?
- (iv) How many trees were planted? What proportion of tree seedlings surviving?
- (v) How many households with improved livestock?

5.2.3 Composition of evaluation team

The general meeting of the community members and key stakeholders appointed the evaluation team. The composition of the evaluation team included community members and one hired outsider.

The results of the evaluation team was presented to the same meeting after evaluation to allow timely decision

5.2.4 Evaluation methods

It foreseen that three methods as is the case in monitoring will be used during evaluation exercise:

(i) Documentary review

This focused on monthly, quarterly and annual reports of the project implementation. These gave a picture of the situation of resources, challenges and implementation lags, and the corrective measures taken.

(ii) Interviews

This method was useful in soliciting information from the people affected by the project in one way or the other. It was especially useful in getting opinions of smallholder farmers, government leaders and extension staff. Others were DONET and other NGOs operating in the area as to whether or not, the project had been of beneficial to Mvumi community.

(iii) Observation

The evaluation team carried out observation in the field of actual things done by the project or through the project: improved cattle breeds, trees nurseries, educational materials, improved stoves and farming practices.

In general term, the type of data expected to be collected during evaluation exercise includes changes in agricultural productivity, rise of smallholder farmers' income, change of farming practices and the impact of environmental conservation training program to smallholder farmers.

5.2.5 Analysis and presentation of results

Mostly, descriptive statistics analysis was used as techniques of data analysis. The results were presented in the form of tables and figures. The evaluation results were

presented to the stakeholders (village government, donors and beneficiaries) using flipcharts and handouts.

5.2.6 Conclusion

Participatory monitoring and evaluation (PAME) are vital in leading the project activities towards achieving objectives. It helps the community to do the right things. This means that efficiency and effectiveness could be attained through participatory monitoring and evaluation. By participating in monitoring and evaluation the community address the key issues relating to monitoring to ensure sustainability of the project.

5.3 Sustainability

This project is considered sustainable partly due to a number of facts. Firstly, the project was initiated community themselves during participatory needs assessment. The DONET decided to engage on this project because; the objectives of the proposed project were in line with its goals, vision and mission. Thus the community feels the ownership of the project and hence takes measures for its sustainance.

Secondly, the demonstration plots used for the operation of this project were established and managed by community members themselves. This suggests that the community doesn't depend solely on external assistance, implying that the project will be sustainable regardless the changes in external resources.

Lastly, the project members were involved in each stage of the project to ensure knowledge acquisition on project planning, implementation, monitoring and evaluation. In addition the training on environmental conservation developed interest

among community members to improve agricultural productivity and increased earning of income as well as conserving the environment. This means even with the absence of the CED advisory, the community can run itself sustainably because the project touches the most economic activity which their livelihoods depend upon.

5.3.1 Financial sustainability

Once fully implemented, the project would not demand too much financial support since it is knowledge and skills based, and the knowledge so gained by smallholder farmers through training have empowered them to continue on their own using the acquired skills and experience even when external support (fund) is over.

5.3.2 Policy relevance

The project goal of improved incomes of community members was in line with the general government policy that aims at eradication of poverty. All social and political institutions in the country are founded on this premise, and will therefore support the success of this project.

CHAPTER SIX

RESULTS AND RECOMMENDATIONS

This chapter gives a brief summary of the key issues raised in this report. It focuses on key questions such as what did the project intend to achieve and what was actually achieved and why, what can be done to improve the situation on the current project or other projects operating under similar conditions. These questions are addressed under two sub-headings, results and recommendations.

6.1 Results

It was assumed in this study that the goal and/or objectives for the project will not change during the life of the project and would be met in full extent. However due to external factors the groups were not likely to attain the goal of improving agricultural productivity during reporting time due to draught experienced in the area. The community, however, was able to attain the objective of tree planting.

6.2 Recommendations

The project could not evaluate the impact of the project on the improvement of agricultural productivity and hence high income of the people because the period for the project assignment was too short for smallholder farmers to be trained and implement their knowledge and skills learnt. Also, since the project intended to change their cultural behaviors of using traditional farming practices. Therefore it is more likely that there needed a long time to see the impacts of the project.

A research is needed to ascertain the impact of environmental conservation program on agricultural productivity and incomes of the smallholder farmers.

For successful implementation of a project on capacity enhancement of smallholder farmers for environmental conservation and improved agricultural productivity in semi arid areas like Mvumi Makulu ward (Dodoma); the following are important considerations;

(i) Focus on People's Livelihood activities

Interventions aimed at reducing environmental degradation must primarily focus on improvement of their lives in terms of improved food production and income. It is only when smallholder farmers realize that the intervention is contributing to their immediate welfare that they can take it serious. It is after that one can think of other related activities such as tree planting.

(ii) Committed and reliable support organization.

People, left on their own can easily be discouraged by the very nature of the long term projects' results such as this environmental conservation one. DONET is local NGO which is based in Dodoma. It have experienced staff to work with the people.

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