

**UNIVERSITY OF NAIROBI**

**DEPARTMENT OF SOCIOLOGY**

**An Evaluation of Kilome Division Global Environment Facility/Small Grant Programme Co-financed Land Degradation Cluster Project.**

**CSO 698 Project Paper**

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**A Project paper submitted in Partial fulfillment of the requirement for the degree of Master of Arts, in Rural Sociology and Community Development at the University of Nairobi.**

November 2012

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## DECLARATION

I declare that this project is my original work and has not been presented for a degree in any other university.

Anne Nkirote

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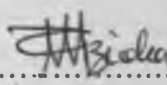
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## **DEDICATION**

This project paper is dedicated to my husband Gerrald Mugambi, daughters: Kanana and Mukami and to my late father Samuel M'murithii.

## ABBREVIATIONS AND ACRONYMS

ADB-Asian Development Bank

AfDB-African Development Bank

ASALs-Arid and Semiarid Land

CBO-Community Based Organization

FAO-Food and Agricultural Organization

FFS-Farmers Field School

FGDs –Focused Group Discussions

GEF-Global Environment Facility

Gok-Government of Kenya

HLPMS-High to Medium Penitential Areas

IaDB-Inter-American Development Bank

KID-Kenya Initiatives for Development

NGO-Non-Governmental Organization

S.H.G-Self Help Group

SDO-Social Development Officer

SGP-Small Grant Programme

SLM-Sustainable Land Management

TOR- Terms of Reference

UNCCD- United Nations Convention to Combat Desertification

UNDP-United Nations Development Program

UNEP-United Nations Environmental Program

UNFCCC-United Nations Framework Convention on Climate Change

UNIDO-United Nations Industrial Development Organization

UN-United Nations

W.G –Women Group

WMO-World Metrological Organization

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## ABSTRACT

This study was carried out on Kilome land degradation rehabilitation cluster project to explore the community involvement in rehabilitating the degraded land in Mukaa District in the Lower Eastern province in Kenya that suffers lots land degradation. To reverse and prevent further land degradation, Kenya Initiative for Development( KID) a local Non- Governmental Organization in the area together with other 10 Community Based Organizations(CBOs) received a financial grant of USD 300 in the year 2006, to implement several community projects aimed at alleviating and restoring the highly degraded land.

Both probability and non-probability sampling techniques were used. The study benefited both from qualitative and quantitative methods of data collection. Semi-structured interviews were administered using a questionnaire to respondents from 107 households. 5 Focused group discussions were held using a focused group discussion guide with 5 CBOs undertaking the projects. A total of nine key informants were interviewed, an interview guide was used. Direct observation method was used to observe physical and economic context which the respondent live, the type of land degradation and what the community was doing to mitigate the same. The community participated in the projects by; (i) building gabions (ii) building check off dams (iii) digging cut off trenches and (iv) planting trees. The project immediate benefits included: improved food security, water, reduction in soil erosion, and increase in household income through the food for work program. Challenges encountered included ;(i) drought, delay in receiving funds, misappropriation of funds and difficult working conditions and group conflicts.

Conservation activities should be broadened and integrated with other pressing community needs. Observation from this study indicate that the success of the project was not necessarily because the community was going for land rehabilitation as such, but they were able to identify solutions for other problems e.g. they dug the cut-off trenches and desilted the existing dams as a way of harvesting water and directing it to dams for future use. It would be important in future to carry out a summative evaluation of the project to establish the long term impacts of the projects to the community.

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# CHAPTER ONE

## 1.1 Background and Problem Statement

Land degradation is the deterioration of land quality, its topsoil, vegetation and/or a water resource caused usually by excessive or inappropriate exploitation or the long-term decline in ecosystem function and productivity (FAO, 2008). Land degradation is increasing in severity and extent in many parts of the world, with more than 20 percent of all cultivated areas, 30 percent of forests and 10 percent of grasslands undergoing degradation. (UNEP, 1999). It is estimated that 1.8 billion people worldwide live in areas with some noticeable land degradation reducing livelihoods and food security. The rate at which arable land is being lost is increasing currently 30-35 times the historical rate. (UNEP, 1999). Land degradation threatens our future and that of our children. Despite the stated determination of 193 countries that ratified the United Nations Convention to Combat Desertification (UNCCD) in 1994, land degradation is worsening rather than improving. Land degradation is occurring in many parts of nearly all developing countries this is being driven mainly by poor land management.

Human activities can degrade the land and negatively impact water and biological resources, thus affecting the lives and livelihoods ability of vulnerable communities. Activities that contribute to land degradation include: soil erosion, denudation, pollution, loss of organic matter, and loss of fertility, loss of vegetation cover, invasive species and habitat conversion (whether urban or agricultural). The consequences of land degradation include; reduced productivity, migration, food insecurity, damage to basic resources and ecosystems, and loss of biodiversity through changes to habitats at both species and genetic levels. Land degradation cancels out gains advanced by improved crop yields.

Land degradation also has important implications for climate change mitigation and adaptation, as the loss of biomass and soil organic matter releases carbon into the atmosphere and affects the quality of soil and its ability to hold water and nutrients. Land degradation, therefore, exacerbates poverty, which in turn exacerbates land degradation because as the pressure increases, human beings are forced to intensify over-utilization of their land for survival.(Darkoh, 1993).

A sustainable response to land degradation can be found in production systems that allow for a symbiosis of man and nature, guaranteeing the survival of both, not as separate entities, but as one integrated system (Ibrahim, 1993). The converse of land degradation is the process by which the biological and economic potential is conserved and/or improved, called sustainable resource management.

As the nation strives to achieve its development goals, including targets under the Millennium Development Goals(MDGs)and those related to Vision 2030, it is important to effectively plan and manage its environmental, as well as its economic and human resources. Environmental changes brought by human activity, such as deforestation; desertification and agricultural practices in fragile ecosystems which lead to land degradation contribute to an increase in the disastrous consequences of floods and droughts what were once purely natural weather hazards. According to a study carried out in 2008 using remote sensing to identify degrading areas in Kenya based on loss of Net Primary Productivity (NPP) between 1981 and 2003 found out that 18 per cent of Kenya's total land was degraded (Bai et al, 2008).

Kilome Division in Mukaa district in the lower Eastern Province is one area that is highly degraded, as a result of interactions between climatic and anthropogenic pressures. Evidence of land degradation in the area include: soil erosion, huge gullies, silted dams, drying water streams/rivers, deforestation, and food scarcity. Land degradation in the area as led to substantial loss of land, resource conflicts, environmental deterioration and loss of income. To reverse and prevent further land

degradation in the year 2005 Kenya Initiative for Development (KID) a local Non-governmental organization (NGO) together with 10 other Community Based Organizations (CBOs) in the division submitted a proposal to Global Environment Facility (GEF)/Small Grants Programme (SGP) and received a grant of US\$ 300,000 to implement several community projects aimed at alleviating and restoring the highly degraded land.

GEF was created in 1991 by the World Bank to help developing countries and those with economies on transition to protect and manage the global environment by providing grants. Administered by the UNDP, the SGP is one funding arm of the GEF. Since its inception in Kenya in 1993, SGP has been co-financing projects at the community level which address global environment concerns, or those addressing deficiencies in policies with a view to contributing to policy making on the issues addressed. The programme's focal areas include: biodiversity conservation, and mitigation of the global climatic change and protection of international waters.

### **1.1.1. Kilome Division Land Degradation Rehabilitation Project**

Kilome land degradation rehabilitation project area covered approximately 40.8 km<sup>2</sup>. The division is divided into two sub-ecosystems, namely: Kaketa riverine and Kavuko hills. These two ecosystems are strongly linked but display very different land degradation indicators, KID Proposal (2005)

#### **1.1.1.1 Kaketa Riverine Sub-Ecosystem**

The Kaketa River is one of several streams originating from the Kilome- Kilungu forest block, a 148.4 hectares protected area in Mukaa district. The River which runs for over 7km only was a reliable source of water for many years, leading to human settlement within reach of water. The Kaketa Riverine ecosystem was identified as fragile very early by the colonial authority that prohibited activities such as grazing or cultivation within the river bank. Likewise the Kilome forest was gazetted as a protected area partly to ensure the proper functioning of the entire ecosystem. Over the years, however,

the ecosystem and biodiversity they supported is threatened. The causes of this deterioration include:

- a) Poor management of the catchment's area through inadequate forest conservation measures.
- b) Excessive water abstraction from the river for irrigation, industrial and domestic use.
- c) Lack of management plans for the river bank and subsequent absence of the enforcement of the water Act and,
- d) Declining productivity of the landscapes occasioned deforestation and soil erosion

### **1.1.1.2 Kavuko hills, slopes and lowlands**

The existence of long land slopes down the Kilome hills, dry climatic condition and bad land use practices play a major role in accelerating land degradation in Kavuko area. Lack of grazing land for livestock resulted in clearance of indigenous vegetation for cultivation of crops for food security. Clearance of land for settlement and cultivation on the hills further exposed the fragile soil surface to rain splash resulting in soil detachment and sediment production. This condition has led to surface run-off flow resulting in channel incision for gully, rill formation and sediment transportation. With time, as more land is cleared for cultivation to cope with the increasing food demands by increased population, hills have continued to suffer more degradation. The long gullies collect substantially amount of sediments from the hills through surface run off channeling the load down the valleys and making the effect of the load so powerful that the gullies deepen even further with each rainy season.

This thesis is an evaluation of Kilome land degradation rehabilitation project Co-financed by Global Environment Facility (GEF). The thesis primarily reports on interventions, associated issues and socio-ecological lessons learnt after involving the local community in efforts to rehabilitate the highly degraded land of Kilome Division in Eastern Kenya.

## 1.2 Problem Statement

Kilome division is a classic example of how interactions between climatic and anthropogenic pressures can lead to land degradation. Land degradation in the area can be traced back to the colonial days when the local community was forced out of their lands (low lands) by the European settlers, and moved to the fragile hill slopes. Lack of grazing land resulted in clearance of indigenous vegetation for cultivation of crops in the hill sides for food security. Increased human activity on the hills has since continued to expose the fragile soil surface to rain splash resulting in soil detachment and sediment production.

There is loss of biodiversity where most of the shallow-rooted vegetation has been replaced by deep rooted vegetation which is a clear indication that much of the top fertile soil has been eroded. This condition led to surface run-off flow resulting in channel incision for gully, rill formation and sediments transportation. With time as more land is cleared for cultivation to cope with the increasing food demands by increased human population, the hills have continued to suffer more degradation. The land slopes on the other hand collect substantial amounts of sediments from the hills through surface runoff channeling the load down the valleys and making the scorching effect of the load so powerful that the gullies continue to deepen even further.

Formations of gullies have resulted to loss of land, a basic capital and resource on which social development depends. The presence of huge gullies also makes movement of people as well as livestock a challenge. Some of the huge gullies have cut across some family farms and to access the other part of the family farm one is forced to walk long distances to where an earth bridges, has been constructed in order to crossover. Though the community had made tremendous effort to construct earth bridges they were of little value during the rainy seasons. There were reported cases of people and livestock falling into these gullies leading to injuries and/or deaths. In the absence of proper management

and stabilization; these gullies posed continued threat to the farm lands of the area and finally a threat to livelihoods.

Those living on the hill slopes were forced to drop cultivation as a means of livelihood due to loss of top fertile soil, decreased soil depth and reduced water holding capacity. The lower areas where the gullies emptied their load, lots of sediments were deposited making many families continue to lose their agricultural land each year. Flooding and sand deposition during the rainy season destroyed people's crops hence promoting famine; frequently the local community was forced to depend on government relief food. As a result, some of the community members turned to sand harvesting along the river beds and charcoal burning as a source of livelihood which even degrades the land and jeopardizes their survival further.

There was loss of biodiversity where most of the shallow-rooted vegetation was replaced by deep rooted vegetation. The dominant vegetation in the area, include the acacia trees which are drought resistance and many varieties of aloe and cactus plants which flourish in degraded lands. Most of the households in the area use fuel wood for cooking purposes which is a big threat to the woody trees. Land degradation in the division also led to acute water shortages for example River Kaketa that was once a permanent source of water dried up with time. Members of the community especially women and children, walked long distances in search of water for both domestic and livestock purpose.

In attempts to remedy the situation and restore the lost land, GEF/SGP co-financed the Kilome land degradation rehabilitation project. The community projects to be carried out included: desilting already existing check dams, building new check dams, fencing the dams, reforestation, construction of gabions along the gullies, building water tanks and cattle troughs, digging of cut-off trenches on the farms and production of tree seedlings. Generally this study compares the planned activities with the actual achievements to find out how much the project has achieved the intended objectives.



Further the study seeks to investigate local community involvement in restoring its degraded land and the effects of land degradation on household food security and access to water over time.

## **1.3 Research Objectives**

### **1.3.1 General Objective**

The overall objective of this study is to evaluate the community involvement in undertaking land degradation rehabilitation interventions and the extent of their appropriateness and replicability.

### **1.3.2 Specific objectives**

- 1) To analyse the population parameters of the community likely to influence the implementation of the project
- 2) To find out to which extent the groups had implemented activities they set out to do
- 3) To establish the nature of community participation in the land degradation rehabilitation project
- 4) To establish the benefits accruing from participating in the land degradation rehabilitation the project
- 5) Highlight the various challenges community members encountered while carrying out the various interventions

## **1.4 Research Questions**

- i. What are the population parameters likely to influence the implementation of the project?
- ii. Were the intervention activities critical to the project?
- iii. Did the community groups effectively implement the interventions?

- iv. In what forms and ways were community member involved in the project activities?

## **1.5 Justification of the Study**

Kenya Vision 2030 is the country's new development blueprint for the period 2008 to 2030. It aims to make Kenya a "middle income country providing high quality life for all its citizens by the year 2030". Vision 2030 is based on three pillars: the economic, social and political pillars. In one way or another, these pillars are all interrelated and the fiber that binds them together is the natural environment, with its inherent supply of renewable and non-renewable goods and services. It is therefore cognizant that achieving Vision 2030 depends on maintaining the natural systems that support agriculture, energy supplies, livelihood strategies, and tourism.

The dual socioeconomic and ecosystem benefits of halting or reversing land degradation are directly aligned with three of the MDGs: eradicate extreme poverty and hunger (no.1); ensure environmental sustainability (no.7);and develop a global partnership for development (no.8)Given this fortunate synergy, it is timely to focus on this important issue of land degradation.

Land and its associated natural resources are vital to the well-being of most Kenyans. Despite rapid urbanization, over 60 percent of Kenyans still live in rural areas, while many urban poor rely on natural resources for at least part of their incomes. However these natural assets are being lost or degraded by extensive illegal, irregular, and ill planned settlements and illegal forest resource extraction. Such extensive and on-going destruction of the country's natural assets and their economic value is a matter of national concern. Kilome Land Degradation Rehabilitation Project addresses the issue of food insecurity in the region from the colonial period to the present. The project area has persistently experienced water shortage, declining food production and therefore

efforts' aiming at increasing the resilience of the community towards changes in the environment is a welcome enterprise

Over 10 million people in Kenya today are facing hunger or worse. Kenya's situation sadly is not unique. Drought, erratic rainfall and desertification likely intensified by climate change are realities for numerous communities that rely directly on land, soil and forests to meet basic needs. As the world marked the world environment day on 5<sup>th</sup> June 2011, it was clear that throughout Africa and much of the developing world, environmental issues were not a luxury but a basic requirement for socio-economic survival. Indeed, protecting and restoring forest ecosystems, and arresting environmental degradation, are matters of life and death.

After conceptualization and implementation of a project it is important to examine the project to ensure the goals remains on focus and also compare the planned versus actual achievement. This paper reports on community involvement in carrying out various land rehabilitation interventions. It was important to document results and progress towards objectives and generate lessons about the project which could be used to improve future designs both by the recipients and the donor. The community's experience may be instructive for similar initiatives throughout Kenya and other rural regions of sub-Saharan Africa in a similar situation.

## **1.6 Scope of the Study**

The key issues included in this study are: Global Environment Facility/ Small Grant Programme, Kenya Initiative Development Project (KID), the role of the groups in carrying out the interventions aimed in reversing land degradation, community participation in reversing land degradation, promoters of land degradation, challenges encountered in carrying out the interventions, key stakeholders in the project, and the benefit gained from participating in the projects.

## CHAPTER TWO

### 2.0 LITERATURE REVIEW

#### 2.1. The Global Perspective of Land Degradation

Land degradation generally signifies the temporary or permanent decline in the productive capacity of the land (UN/FAO definition). Land degradation describes how one or more of the land resources (soil, water, vegetation, rocks, air, climate, relief) has changed for the worse. This paper adapts the definition by UN Convention to Combat Desertification, (UNCCD) which is the definition adopted by GEF is as follows:

“Land degradation is a reduction or loss, in arid, semi- arid and dry sub- humid areas, of biological or economic productivity and complexity of rain-fed cropland, irrigated cropland, or range, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including process arising from human activities and habitation patterns such as:(i) soil erosion caused by wind and /or water;(ii) deterioration of the physical ,chemical and biological or economic properties of soil; (iii)and long term loss of natural vegetation” (WMO 2005)

According to UNCCD, over 250 million people are directly affected by land degradation. In addition, some one billion people in over 100 countries are at risk (WMO 2005).These people include many of the world’s poorest, most marginalized, and politically weak citizens. Land degradation issue for world food security and quality of the environment assumes a major significance when one considers that only about 11 per cent of the global land surfaces can be considered as prime or class 1 land, and this must feed the 6.3 billion today and the 8.2 billion expected by the year 2020 (WMO, 2005) hence land degradation has remained high on the international agenda in the 21<sup>st</sup> century.

Land degradation occurs slowly and cumulatively and has long lasting impacts on rural people who become increasingly vulnerable (Muchena 2008, WMO 2005) The UNCCD of which Kenya is a signatory, recognizes land degradation as a global development and environment issue. Sustainable land management practices are needed to avoid land degradation. Land degradation typically occurs because of land management practices or human development that is not sustainable over time.

## **2.2. Land Degradation in Kenya**

Kenya's land area is about 582 646 km<sup>2</sup>, of which 2.2 per cent is surface water. Generally, Kenya's land use is largely pastoral in semi-humid and semi-arid zones and agricultural in the moist and humid zones. A huge proportion of Kenya's land area is mainly arid or semi-arid lands, called ASALs, accounting for over 80 per cent of the total area (GoK 2004). About 17 to 20 per cent of the land has medium to high potential for agriculture; these lands are termed High to Medium Potential Lands (HMPLs). Together, forests, woodlands, national reserves, and game parks cover ten per cent of the land (Survey of Kenya 2003, NLPS 2007, WRI and others 2007).

The total average area under cultivation at a national level continues to increase, as crops are introduced in gazetted forest lands, some humid rangelands are converted to farmland, and land under fruits and vegetables increases. Crops are grown on a significant proportion of marginal land with low or variable rainfall and it is likely that more such lands are being converted to crops even though there is high risk of failure (WRI and others 2007). Amounts of land in the agriculturally productive highlands and the productivity of these lands are declining due to growing populations; an increase in competing land uses including forestry, wildlife conservation, and urban development; poorly planned settlements; new cultivation methods and cropping systems; the subdivision of land; and the introduction of irrigation schemes and sedentary farming and livestock management.

Land division is an ongoing problem in the HMPLs, where they often suffer from continuous fragmentation into sizes too small to be profitable. Social impacts include the exclusion of women in land ownership and decision-making (NLPS 2007). As a result of these changes, all areas are experiencing land degradation. The result is a loss of land productivity with impacts on livelihoods and the economy. Unsustainable human activities that take place in already fragile areas and that are aggravated by natural disturbance such as drought or flooding lead to land degradation and desertification.

Kenya's 2002 National Action Programme on desertification reported the following: "The existing ecological conditions in dry lands are harsh and fragile. These conditions are exacerbated by frequent drought and the influx of people from the high potential areas into the dry lands. Overgrazing and subdivision of land into uneconomic land parcel sizes have further worsened them. Under these circumstances, dry lands are getting more and more vulnerable to desertification in Kenya" (GoK 2002). Population growth is contributing to the influx of more people into arid and semi-arid land (ASAL), land is being fragmented into uneconomical parcels, marginal lands are increasingly being cultivated, pastures are being overgrazed, and forests encroached upon. All these conspire to degrade the land (Muchena 2008, KLA n.d.).

According to Macharia (1997) in the northern rangelands, 12.3 per cent suffered from severe land degradation, 52 per cent to moderate land degradation, and 33 per cent faced slight vulnerability to degradation. The study identified degradation in ASALs as a potential precursor to widespread desertification (KLA n.d.). In the early 2000s, approximately 30 per cent of Kenya was affected by very severe to severe land degradation (UNEP 2002) and an estimated 12 million people, depended directly on land that is being degraded (Bai and others 2008). The droughts of 1970-2000 accelerated degradation and reduced per-capita food production (GoK 2002).

More recent studies extrapolating on local findings of spatial and temporal patterns of land degradation, show that land degradation is increasing in severity and extent in many parts of the country, over 20 per cent of all cultivated areas, 30 per cent of forests, and 10 per cent of grasslands are subject to degradation (Muchena 2008). A 2006 pilot study found that potential areas of land degradation, defined as places where both net primary productivity and rain-use efficiency (the ratio of net primary productivity to precipitation) were declining, occupied 17 per cent of the country and 30 per cent of its cropland. The expansion of cropping into marginal lands accounts for much of this degradation. It identified the dry lands around Lake Turkana and marginal cropland in Eastern Province as the areas of sharpest decline (Bai and Dent 2006).

One measure of land degradation is the loss of net primary productivity (NPP), although such losses do not always indicate land degradation (Bai and others 2008). A 2008 study that used remote sensing to identify degrading areas based on loss of NPP between 1981 and 2003 found that 18 per cent of Kenya's total land area was degraded; shown in Table 1.0 on the next page.

Table 1.0: Degraded areas in Kenya and total population affected by land degradation between the years 1981-2003

Degrading area(km <sup>2</sup> )	Per cent of Kenyan territory	Per cent of globally degraded areas	Total NPP loss(tonnes c/23 years)	Per cent of total population affected	Number of people affected
104 994	18.02	0.294	6 612 571	35.59	11 803 311

Source: Bai and others, 2008

## 2.3 Consequences of Land degradation in Kenya

The impacts of land degradation include a reduction in crop and pasture productivity and fuel wood and non-timber forest products, which are closely linked to poverty and

food insecurity. The damage to soil, loss of habitat, water shortages, and siltation reduce biodiversity and ecosystem services and has economic consequences (Bai 2008). Land degradation manifests itself in many forms; among them are soil erosion, increased sediment loading of water bodies (e.g. Lake Baringo), loss of soil fertility, salinity, reduced ground cover, and the reduced carrying capacity of pastures as in Amboseli National Park (UNEP, 2009)

Developing countries, such as Kenya, are still heavily reliant on revenues from exported natural resources such as agricultural commodities. For example, in the 1990s, 53 per cent of Kenya's export earnings were derived from agricultural products such as coffee, sugar, and flowers (Nyangiton.d.). Agriculture presently accounts for 26 per cent of Kenya's GDP (NEE 2008). The distribution of poverty across Kenya varies from one province to another. Each province offers a unique blend of environmental, geographical, and infrastructure characteristics, which in turn influence poverty levels. Certain environmental factors can contribute to poverty alleviation (Precipitation Variability, Land Slope, Food Frequency, Presence of Wetlands, and Travel Time to Roads and Access to Forest)

In Kenya 57.6 million ha are devoted to agriculture. Of this, only 9.4 million ha or about 17 per cent of the total land area is classified as having high to medium potential for farming (DRSRS 2008, FAO 2000). The ASALs cover 48.0 million ha, accounting for about 83 per cent of the total land area. In the ASALs about 9 million ha can support some form of agriculture while 15 million ha are just adequate for livestock keeping. The rest, amounting to 24 million ha, is dry and only suitable for nomadic pastoralism. Productivity in lands of high to medium potential is declining in the face of growing demands for food and other agricultural products. Soil erosion, loss of fertility, flooding and biodiversity loss are increasing in all areas (Survey of Kenya 2003). Changing environmental factors related in part to land degradation have already had an impact on household food security for many Kenyans who would benefit from reliable forecasts, increased water availability, and improved soil fertility to sustain their livelihoods.



Poor households rely heavily on expenditure-saving, labor intensive activities for their subsistence and survival, such as collecting water and fuel wood or grazing animals on common lands. Common property resources or open access lands are important sources of livelihoods for the poor, providing them with a variety of goods, which can include food, water, fuel, fodder, bamboo, resin, gum, oils, construction materials, honey, medicinal plants, and spices, among others. Many poor households depend on their local environments for food security. Poor soils and low agricultural productivity, lack of control over land management, and competition from other users are some of the conditions that threaten household food security.

Food security is closely related to the achievement of a number of other MDGs: for example, poor nutrition is implicated in more than half of all child deaths worldwide (Jolly 2001), slowing the gains to be made by addressing food security in targeting goal 4, which calls for reducing child mortality. Over 36 per cent of all the rural poor Kenyans live on marginal lands or areas that are particularly vulnerable to environmental degradation, such as flood plains, coastal areas, and degraded hillsides. Depending on such lands for food can render poor people vulnerable to periodic hunger. Environmental hazards and extreme events, such as droughts, floods, forest fires, and landslides, are more damaging in marginal and degraded ecosystems and the poor living there are least able to cope with their impacts.

## **2.5. Causes of Land Degradation**

The causes of land degradation can be divided into: natural hazards, direct causes, and underlying causes. Natural hazards are the conditions of the physical environment which lead to the existence of a high degradation hazard, for example steep slope as a hazard for water erosion. ([www.fao.org/decrop](http://www.fao.org/decrop)). There is a distinction, although with overlap, between unsuitable land use and inappropriate land management practices. Unsuitable land use is the use of land for purposes for which it is environmentally unsuited for

sustainable use. An example is forest clearance and arable use of steeply sloping upper watershed areas which would have more value to the community as water sources, managed under a protective forest cover. Inappropriate land management practices refer to the use of land in ways which could be sustainable if properly managed, but where the necessary practices are not adopted. An example is the failure to adopt soil conservation measures where these are needed.

### **2.5.1. Direct Causes of Degradation**

Direct causes of land degradation are unsuitable land use and inappropriate land management practices, for example the cultivation of steep slopes without measures for soil conservation. They include:

- a) Deforestation
- b) Overharvesting of forest resources
- c) Shifting cultivation
- d) Overgrazing
- e) Non-adoption of soil conservation management practices and
- f) Extension of cultivation into marginal lands

Deforestation of unsuitable land: deforestation is both a type of degradation and also a cause of other types of degradation, principally water erosion. Deforestation in itself is not necessarily degrading, without it; most productive agricultural lands would not be available. Deforestation causes degradation when the land that is cleared is steeply sloping, or has shallow or easily erodible soils; and secondly, where the clearance is not followed by good management ([www.fao.org/decrop](http://www.fao.org/decrop)).

Over-harvesting of forest resources: rural people cut natural forests, woodlands and shrub lands to obtain timber, fuel wood and other forest products. Such cutting becomes unsustainable where it exceeds the rate of natural regrowth. This has happened widely in semi-arid environments, where fuel wood shortages are often severe. Impoverishment of the natural woody cover of trees and shrubs is a major factor in causing both water erosion and wind erosion (FAO China, 2003, Kilome land baseline report 2005, Berry et.al 2005)

Shifting cultivation without adequate fallow periods; in the past, shifting cultivation was a sustainable form of land use, at a time when low population densities allowed forest fallow periods of sufficient length to restore soil properties. Population increase and enforced shortening of fallow periods has led to it becoming non-sustainable.

**Overgrazing:** this is the grazing of natural pastures above its carrying capacity. It leads directly to decreases in the quantity and quality of the vegetation cover. This is a leading cause not only of wind erosion, but also of water erosion in dry lands. Loss of the vegetation cover, leads to a decline in soil organic matter and physical properties, and hence in resistance to erosion. Intense grazing at the end of the annual dry season, and during periods of drought, does not necessarily lead to degradation; the vegetation may recover during the succeeding rains. Degradation occurs when the recovery of vegetation and soil properties during periods of normal rainfall does not reach its previous status.

**Non-adoption of soil conservation management practices:** under arable use, management practices are needed to check water erosion on all sloping lands. In dry lands, measures to check wind erosion are necessary also on level land. Soil conserving management practices may be grouped into: Biological methods: maintenance of a "round surface cover, of living plants or plant litter; vegetative barriers, including both contour hedgerows and grass strips; and windbreaks and shelterbelts. Earth structures: terraces, and the various forms of bank-and ditch structures (bunds, storm drains, gabions etc.). Maintaining soil resistance to erosion: primarily, maintenance of soil organic matter and thereby aggregation and structure.

**Extension of cultivation, onto marginal lands;** historically the more fertile, or high-potential, agricultural lands were the first to be occupied. Population increase has led to the widespread use of lands which are less fertile or have greater degradation hazards. Such marginal lands include: steeply sloping land and areas of shallow or sandy soils.

### 2.5.2 Underlying Forces Causing Land Degradation

Underlying causes are the reasons why inappropriate types of land use and management are practiced; for example, the slopes may be cultivated because the landless poor need food and conservation measures not adopted because these farmers lack security of tenure. There are more basic reasons underlying the reasons for land degradation outlined above they include:

(i)Land shortage: It has always been recognized that land is a finite resource, but only recently has the full impact of this fact occurred. In earlier times, food shortage or poverty could be combated by taking new, unused land. When combined with increases in rural population, land shortage has led to decreases in the already small areas of agricultural land per person. These causes may include the conversion of unsuitable, low potential land to agriculture, the failure to undertake soil conserving measures in areas at risk of degradation and the removal of all crop residues resulting in 'soil mining' (i.e. extraction of nutrients at a rate greater than resupply. (FAO 2008, UNEP 2009)

(ii)Land tenure-there is many confounding reasons why land users permit their land to degrade. Many of these reasons are related to societal perceptions of land and the values placed on it. Farmers will be reluctant to invest in measures to conserve land resources if their future rights to use these resources are not secure. (WMO climate and land degradation WMO-NO.9892005). The absence of land tenure and the resulting lack of stewardship is a major constraint to adequately care for the land in some countries. Degradation is also a slow, imperceptible process, meaning that many people are not aware that their land is degrading.

(iii)Poverty: although the relationship may be complex, poverty and land degradation are closely linked because rural production depends directly on the health of the natural resource base. (Berry et.al 2005).Poverty leads to land degradation. It could almost certainly be shown that richer farmers maintain their soils in better state than the poorer ones. Any attack on rural poverty therefore must include a substantial component that

addresses increased and sustained rural productivity based on sustainable land management (SLM)

(iv) Population increase; high population density is not necessarily related to land degradation. Rather, it is what a population does to the land that determines the extent of degradation. (WMO, 2005). People can be a major asset in reversing a trend towards degradation. Indeed, mitigation of land degradation can only succeed if land users have control and commitment to maintain the quality of the resources. However they need to be healthy and politically motivated to care for land as subsistence agriculture, poverty and illiteracy can be important causes of land and environmental degradation

## **2.6. Impact of Land Degradation on Food Security and Water**

Food security refers to the availability of food and one's access to it. A household is considered food-secure when its occupants do not live in hunger or fear of starvation. Two commonly used definitions of food security come from the UN's Food and Agriculture Organization (FAO) and the United States Department of Agriculture (USDA): According to UN's Food and Agriculture Organization, food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security for a household means access by all members at all times to enough food for an active, healthy life. Food security includes at a minimum (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (that is, without resorting to emergency food supplies, scavenging, stealing, or other coping strategies). (USDA)

The food crises of 2007 and 2008 resulted in 50 to 200 percent increases in food commodity prices, which drove 110 million people into poverty and added 44 million more malnourished people in the world. As a result of population growth, increased incomes and growing consumption of meat, the demand for food will keep rising and

will require a 50 percent increase in food production in 2050; the increased contribution will partly come from greater outputs per hectare. (Nelleman et al 2009)

Even though land degradation is often visible and water shortage reported daily in the press, it is difficult to translate these phenomena into consequences for food security, it is difficult conceptually and in practice. For subsistence farmers, consequences are direct: less food with more efforts, and even: moving out. But nowadays, most farming households, however, do take part in food trade. As producers of food, degradation leads to lower yields with more efforts, so: either less food or less income. As consumers, they can buy food if they have money. Degradation may also lead to increased cost of living and to higher food prices. Household food security is affected also in the second case, albeit in a more complex manner. In fact, the relation between degradation and food security is of enormous complexity due to the interactions between land, water, populations and wealth, and the rapid changes therein. There are strong indications that consequences of degradation for food security at the household level already affect many people significantly (e.g. Bridges et al., 2001, Scherr, 2001).

Global food security, on the other hand, is not affected much, yet. For global food security, the emphasis is that sufficient food is produced in the world to meet the full requirements of all people: total global food supply equals the total global demand. For national food security, the focus is on sufficient food for all people in a nation; it can be assured through any combination of national production and food imports and exports. For household food security, the focus is on the ability of households, urban and rural; to purchase or produce food they need for a healthy and active life. Food security has always a component of production, access, and utilization. In some places, land degradation has been implicated in decreased water resources, which has had a cascading effect: increased trekking distances and water costs; more competition for declining water supplies; failed crops, increased food prices; earlier livestock migration; weaker livestock, predisposing them to diseases; and food insecurity as families are left without milk and animal products(KFSSG 2008).

Food security is key to achieving global anti-poverty goals (UN Secretary General Ban-Ki-Moon). For all these reasons, achieving the first MDG—eradicating extreme poverty and hunger—requires renewed efforts towards achieving MDG 7—ensuring environmental sustainability, through the sustainable management of land, water, biodiversity resources, and the adequate provision of urban sanitation, potable water, and waste management. While international concerns are often expressed in broad terms such as desertification or climatic change, the environmental problems of concern to vulnerable groups in marginal areas are generally localized in nature revolving around immediate issues such as the degradation of a particular range land or soil erosion on farmland or the progressive shortening of fallow or dam. These affect the poor because they are directly related to household food security. Degradation of the resource base in generally translates into decrease in production or income and thus in the availability of food. ([www.fao.org/gender](http://www.fao.org/gender))

Declining soil fertility leads to lower crop yields while range land depletion reduces off take. Degradation of common property resources pulls labor away from directly productive activities towards gathering—simply collecting non-wood and minor forest products—and probably diminishes opportunities for deriving income from this source. In addition, recurrent drought or natural calamities also directly results in progressive loss of food security prospects.

Rural women play a key role in on and off farm activities in the developing countries. Women headed households; women are becoming more and more responsible for the day to day survival of the family. Women tend to be more vulnerable than men to the effect environmental degradation because they often involved in harvesting common property sources such as water and wood. Soil degradation, chronic water shortages, inappropriate agricultural policies and population growth threaten food production in many countries ([www.fao.org](http://www.fao.org)) Securing water is critical to achieving food security and improving livelihoods. Women manage water resources for domestic and productive

uses, and are getting more attention in the planning of water projects; the projects are becoming more multi-purpose, multi-use and multi-user oriented (Wahaj, R 2007)

## 2.7 Millennium Declaration and the Millennium Development Goals

Millennium declaration was adopted in September 2000 by all the 189 member states of the UN General Assembly, Kenya included. The declaration set out within a single framework the key challenges facing humanity at the threshold of the new millennium. In recognition of need to translate its commitment into action, a broad interagency consultation arrived at the eight MDGs.(www.un.org/millennium declaration).The eight MDGs are designed to :**(i)**eradicate poverty and hunger,**(ii)**achieve universal primary education,**(iii)**promote gender equality and empower women,**(iv)**reduce child mortality,**(v)**improve maternal health,**(vi)**combat HIV/AIDS, Malaria and other diseases,**(vii)**ensure environmental sustainability, and **(viii)**develop a global partnership for development.(www.undp.org).

The MDGs provide a framework to plan and implement development, and include time-bound targets and indicators by which progress can be measured over the period from 1990 until 2015 when the targets are expected to be met.(UNEP 2009,IISD 2008). The targets for MDG 7 are indicated in table 2.0 below.

Table 2.0: Targets for MGD 7-Ensure Environmental sustainability

Target A:	Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources
Target B:	Reduce biodiversity loss,achieving by 2010,a significant reduction in the rate of loss



Target C	Half, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation
Target D:	By 2020, achieve a significant improvement in the lives of at least 100 million slum dwellers

Source: UNDP (2005)

### 2.7.1 Environmental Links to the MDGs

Environmental goods and services underpin economic and social development; thus maintaining and improving the environment's viability is essential for a country to be able to adequately support its growing population and achieve its development plans. In its efforts to achieve Vision 2030, the Government of Kenya is working towards a long-term plan based on the MDGs.

Environmental resources and conditions have a significant impact on many aspects of poverty and development, and achieving environmental sustainability. The Environment sector cuts across all other sectors and contributes directly or indirectly towards the achieving the other MDGs. One of the most powerful ways to help achieve the first MDG — eradicate extreme poverty and hunger — is to ensure environmental quality and quantity is maintained in the long term (Table 2.1). In view of this, interventions in other sectors have a bearing on the achievement of MDG 7, hence the need to mainstream environment into the National and sectoral planning.

Table 2.1: Key links between the environment and the MDGs

MDG	Link to the Environment
Eradicate extreme hunger and poverty	Livelihoods and food security depend on functioning ecosystem. The poor often have no entitlements to environmental resources and inadequate access to environmental information, markets and decision making.
Achieve universal primary education	Time spent collecting water and fuel wood can reduce time available for schooling.

	Lack of energy, water and sanitation discourage teachers to live in rural areas
Promote gender equality and empower women	Water and fuel collection reduce the time that women and girls might have available for education, literacy and income generating activities. Women do not benefit from equal entitlements to land and other natural resources
Reduce child mortality	Water and sanitation related diseases like diarrhea and respiratory infections are the two most important causes of under five mortality. Lack of clean water and fuels for boiling water contribute to preventable water-borne diseases. Increasing the provision of clean, accessible water(MDG 7)can significantly reduce child mortality(MDG 4)and fatal diseases(MDG 6)making it possible for children and women to go to school(MDG 2&3)
Improve maternal health	Indoor air pollution and carrying heavy loads of water and fuel wood affect women's health increasing risks of complication during pregnancy. Lack of energy and sanitation limit the quality of health services in rural areas
Combat major diseases	Environmental health hazards are associated with risk factors e.g. malaria, parasitic infections etc. Disease vector host from wildlife to humans due to environmental degradation
Ensure environmental sustainability	Keeping the resource base (land area covered by forests, biodiversity, water sources) and regulating energy, carbon dioxide emissions and recycling provides the foundation for the links described in this table
Global partnership for development	Global environmental problems need the participation of rich countries (that consume more resources) External debt, unfair terms of trade and predatory investment can increase pressure to overexploit environmental assets in

	developing countries. Production of pollutants as a result of development activities.
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Source: UNDP (2006)

### **2.7.1.1 Kenya's Progress towards MDG 7: Ensure Environmental Sustainability**

Kenya's environment has suffered from the impacts of human activities. Despite their role in environmental social and economic development of the nation, forest and other resources are faced with threats that include : (i) illegal encroachment, excision, charcoal burning, illegal cultivation, poaching of timber and frequent fire outbreaks. (ii) degradation of natural resources resulting from pollution and poor waste management, water catchment destruction and desertification. (iii) poverty which poses enormous challenges to environmental sustainability as the poor rely mostly on natural resources for survival. (iv) repossessioning land previously irregularly acquired. These are some of the challenges the nation needs to address in order to achieve the targets for MDG 7. Environmental considerations should be integrated in all major national and sectoral policies, plans, and decision-making processes.

The nation has increased the proportion of land area protected for biological diversity from 12.1 per cent in 1990 to 12.7 per cent in 2007 (UNEP, 2009). A number of social and political factors continue to put pressure on natural resources and compromise the effective implementation of sustainable development strategies in Kenya. They include limited government capacity for environmental management and insufficient institutional and legal frameworks for enforcement and coordination (UNDP 2005).

### **2.7.2 The importance of the Environment in achieving the Kenya Vision 2030**

Kenya Vision 2030 is the country's new development blueprint for the period 2008 to 2030. It aims to make Kenya a "middle income country providing high quality life for all the citizens by the year 2030 (GOK 2007). Vision 2030 is based on three pillars; the economic pillar, the social and the political pillar. In one way or the other, these pillars

are all interrelated and the fiber that binds them together is the natural environment with its inherent supply of renewable and non-renewable goods and services.

Development objectives and the need to protect and maintain the natural environment must go hand in hand. This is because environmental sustainability including the conservation of biodiversity, underpins human wellbeing (UN 2005). Our natural environment not only provides us with the basic goods needed for sustenance, such as water, food, and fiber, but it also purifies the air and water, produces health soils, cycles nutrients, and regulates climate. The ecosystem services provided by the environment are important for developing and maintaining human health, creating national wealth, and reducing poverty (UN 2005).

#### **2.7.1.2 Environmental Goals for 2012**

It is cognizant that achieving Vision 2030 depends on maintaining the natural systems that support agriculture, energy supplies, livelihood strategies and tourism. Table 2.2 below illustrates how the environment cuts across the Vision 2030's pillars.

To support the social pillar, Kenya aims to provide its citizens with a clean, secure, and sustainable environment by 2030. To achieve this, the nation has set goals such as increasing the forest cover from less than three percent of its land base at present to four percent in 2012 and to lessen by half all environment-related diseases by the same (GOK 2007). The strategies for achieving these goals are: promoting conservation to help achieve the MDGs; improving pollution and waste management design and application of economic incentives; and commissioning public-private partnerships for improved efficiency in water and sanitation delivery. The country also aims to enhance disaster preparedness in all disaster-prone areas and improve the capacity for adaptation to the impacts of global climate change. In addition, Kenya will harmonize environment-related laws for better environment planning and governance (GOK 2007).

Table 2.2: The cross cutting nature of the environmental issues those underlie Vision 2030's pillars

Pillars and Benefits	Sector	2012 Targets	Environmental Challenges
Economic	Tourism	<ul style="list-style-type: none"> <li>• Increase number of visitors from 1.8 million per year to three million</li> </ul>	<ul style="list-style-type: none"> <li>• Develop tourism infrastructure (accommodation, transport) with light environmental footprint so as to preserve natural assets.</li> </ul>
	Agriculture	<ul style="list-style-type: none"> <li>• Add value to crop, livestock, and fish production by processing domestically</li> <li>• Cultivate idle land and open new agricultural lands</li> </ul>	<ul style="list-style-type: none"> <li>• Plan processing plants to avoid environmental impacts.</li> <li>• ensure lands, weather conditions and water availability are suitable for cultivation; plan ahead to adapt to climate change in these areas</li> <li>• Avoid encroachment sensitive ecosystems.</li> </ul>
Social	Health, Water and sanitation	<ul style="list-style-type: none"> <li>• Lessen by half all environmental related diseases.</li> <li>• Improve access to safe water and sanitation.</li> <li>• increase irrigation and drainage levels to promote agricultural productivity</li> </ul>	<ul style="list-style-type: none"> <li>• Be proactive in preventing diseases (instead of end-of-pipe solutions) by protecting and improving access to water sources and providing adequate sanitation facilities.</li> <li>• Conserve water sources.</li> <li>• Introduce innovative water harvesting and drainage schemes.</li> </ul>

	Environment	<ul style="list-style-type: none"> <li>• Increase forest cover from less than three per cent to four per cent</li> </ul>	<ul style="list-style-type: none"> <li>• Increase forest cover, which will help sustain water catchment for hydropower agriculture, wildlife and tourism.</li> <li>• prevent erosion</li> <li>• increase biodiversity</li> <li>• sequester carbon</li> <li>• Provide timber to local people among other environmental benefits.</li> </ul>
	Housing and Urbanization	<ul style="list-style-type: none"> <li>• Increase annual housing units production from 35 000 to 200 000</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure urban plans are environmentally sustainable in terms of building material location and transport options.</li> </ul>
	Equity and poverty elimination	<ul style="list-style-type: none"> <li>• Reduce the number of people living in poverty to tiny proportion of the total population</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the equitable access of all people to the environmental resources they need to sustain their livelihoods and that these resources are managed sustainably.</li> </ul>

Source UNEP, 2008

## 2.8 Global Environmental Facility

The Global Environment Facility (GEF) is a global partnership among 178 countries, international institutions, NGO, and the private sector to address global environmental issues while supporting national sustainable development initiatives. It provides grants

for projects related to six focal areas: biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants ([www.gefweb.org](http://www.gefweb.org)2009)

The Global Environment Facility was established in October 1991 as a \$1 billion pilot program in the World Bank to assist in the protection of the global environment and to promote environmental sustainable development. The GEF provides new and additional grants and concessional funding to cover the "incremental" or additional costs associated with transforming a project with national benefits into one with global environmental benefits. In 1994 at the Rio Earth Summit, the GEF was restructured and moved out of the World Bank system to become a permanent, separate institution. The decision to make the GEF an independent organization enhanced the involvement of developing countries in the decision-making process and in the implementation of the projects. Since 1994 however the World Bank has served as the Trustee of the GEF trust fund and provided administrative services.

The United Nations Development Program (UNDP), the United Nations Environment Program (UNEP) and the World Bank were the three initial partners implementing GEF projects. Seven more agencies joined the GEF family over the years: The Food and Agriculture Organization (FAO), the Inter-American Development Bank (IaDB), the United Nations Industrial Development Organization (UNIDO), the Asian Development Bank (ADB), the African Development Bank (AfDB), the European Bank for Reconstruction and Development (EBRD), and the International Fund for Agricultural Development (IFAD).

Today the GEF is the largest funder of projects to improve the global environment. Since 1991, GEF has achieved a strong track record with developing countries and countries with economies in transition. GEF-funded projects and activities are mainstreamed into the UNDP programme. As of February 2009, UNDP- GEF-funded projects amounted to approximately US\$ 8.74 billion (US\$ 2.69 billion in GEF Grants and US\$ 6.05 in co-financing) representing over 570 full and medium-size projects as

well as more than 370 enabling activities. The Small Grants Programme, which supports small-scale activities in GEF focal areas and the generation of sustainable livelihoods by non-governmental and community-based organizations in more than 119 developing countries, is worth another US\$738.7 million (US\$ 410 million in GEF grants and US\$328.7 million in co-financing). (GEF 2009) Table 2.3 below shows the funding pathways and level of funding of GEF/SGP Co-financed projects.

The GEF Assembly is the governing body of the GEF, in which representatives of all member countries which participate. It meets every three to four years, and is responsible for reviewing and evaluating the GEF's general policies, the operation of the GEF, and its membership. Ministers and high-level government delegations of all GEF member countries take part in the meetings.

Table 2.3: GEF funding pathways and level of funding:

Funding Pathway	Funding Level(USD)	Time required for project proposal development	Preparatory funding (PDF)	Implementation period(years)
Full project	1.0million and over	6-24 months	350,000	15
Medium project	50,000-1 million	6-12 months	25,000	4
Small grant	<50,000	3-6 months	2000	2

Source: Biennial Program Review SGP-Kenya year 2009

The GEF Assembly selects a subset of its members to serve on the GEF Council. The GEF Council functions as an independent board of directors, with primary responsibility for developing, adopting, and evaluating GEF programs. Council members representing



32 constituencies (16 from developing countries, 14 from developed countries, and two from countries with transitional economies) meet twice each year for three days and also conduct business by mail. All decisions are by consensus. The Council's open door policy toward non-governmental organizations and representatives of civil society makes it unique among international financial institutions.

### **2.8.1 The Concept of Co-Financing in GEF**

Co-financing comprises of project resources that are committed by the GEF agency itself or by other non-GEF sources and which are essential for meeting the GEF project objectives. Typically, such resources are committed as part of the initial financing package, but in some cases part of the co-financing may actually be mobilized subsequently ([www.yslme.org](http://www.yslme.org)). Sources of co-financing include: the agency's own co-financing, government co-finance and contributions mobilized for the project from other multilateral agencies ,bilateral development cooperation agencies,NGOs, the private sector and the beneficiaries.

Co-finance may take many different forms, which have different values. Types of co-finance include: grants, loans, concessional, equity investments and committed in-kind support ([www.thegef.org](http://www.thegef.org)). Co-finance is important because it helps expand the resources available to finance environmental objectives, is a key indicator of the strength of the commitment of the counterparts, beneficiaries, and implementing and executing agencies to those projects; and helps ensure the success and local acceptance of those projects by linking them to sustainable development, and thereby maximizes and sustain their impacts.

### **2.8.2 Portfolio of the GEF/Small Grant Programme (SGP)**

Since its inception in 1992, the GEF and SGP has been promoting grassroots action to address global environmental concerns. SGP aims to deliver global environmental benefits in the GEF focal areas of biodiversity conservation, climate change mitigation, protection of international waters, prevention of land degradation (primarily

desertification and deforestation), and elimination of persistent organic pollutants through community-based approaches.([www.undp.org/sgp](http://www.undp.org/sgp))

SGP funding is channeled directly to communities and non-government organizations in developing countries to support the efforts of local people to conserve and restore the environment while generating sustainable livelihoods. SGP currently operates in 76 developing countries in Africa, the Arab States, Asia, Eastern and Central Europe and Latin America, as well as in Small Island Developing States. To date over 5,000 grants of up to US \$50,000 or less have been provided to non-governmental and community-based organizations addressing global environmental issues while generating local benefits. ([www.undp.org/sgp](http://www.undp.org/sgp)).

The GEF/SGP Kenya started in 1993 to fill “a unique and valuable niche not within the GEF but within all international environment and development. By the year 2005 some 165 projects had been implemented at a cost of US \$3 Million with a similar amount raised in co-financing. (GEF/SGP Kenya 2005).The Kilome Land Degradation rehabilitation project was funded by the GEF/SGP at a cost of US\$ 300,000 in the year 2006.

### **2.8.3 Kenya Initiative for Development (KID)**

KID is a registered NGO with strong roots in Mukaa District (formally Makueni District). Its overall mission is to initiate or promote integrated development programmes or projects with the aim of alleviating poverty at a community level through proper management of the environment. KID is functionally a change agent playing a catalytic role in project to stimulate or promote community action towards fulfilling their own priority objectives using their own resources. Where possible, KID solicits for resources to inject into the projects in order to assist in the removal of barriers (social, economic, legal, institutional and scientific) which inhibit action.

In the GEF/SGP land degradation cluster projects KID played a catalytic role in the preparation of the CBOs project outlines and in the interpretation of GEF/SGP call for proposals guidelines. In the implementation phase of the project KID played the role of lead NGO to ensure that the objectives agreed upon between the local community and the GEF/SGP were implemented successfully. KID also was to monitor the project implementation on regular basis and report directly to UNDP-GEF/SGP through the project coordinator based at the project site. The KID's project coordinator was to promote the land degradation project, collect information and create awareness of the overall project goals by organizing monthly meetings for all project co-coordinators, write and disburse minutes, assist local group coordinators in mobilizing the community and also part of the community which did not participate in the community directly, mediate in case of problems between groups, project and other stakeholders and be the link to UNDP/GEF/SGP by assisting in organizing project visits, informing local coordinators and groups.

## **2.9 Kilome Land Degradation Rehabilitation Cluster Project**

The Kilome land degradation cluster projects cover about 40 km<sup>2</sup>. GEF/SGP funded project at a cost of 300,000 USD. The project was aimed at reducing and/or preventing land degradation by focusing on the rehabilitation of gullies, digging cut off trenches to arrest runoff water, building gabions to arrest gully formation, building check off dams and tree planting. Ten CBOs were to carry out the activities listed in table 2.4 below. KID supervised and coordinated all the activities. The activities were to be carried out for two years (2006 to 2008)

Table2.4: Terms of Reference for the 10 CBOs undertaking the GEF/SGP project

Project Title	Implementing CBO	Activities	Grant Amount (USD)
Kavuko Community Centre	KID	<ul style="list-style-type: none"> <li>-fence Kavuko Conservation centre</li> <li>-pay for Kilome land degradation cluster projects' EIA</li> <li>-pay for project coordinators motor bike training</li> <li>-oversee carrying out of EIA and baseline information</li> <li>-purchase motor bike, laptop computer, digital camera, telephone and furniture</li> <li>-oversee the construction of 3 offices. hall, sentry and ablution block</li> <li>-cater for printing, binding photocopying services for 18 months</li> <li>-hold stakeholders seminars</li> <li>-oversee production of publicity materials</li> <li>-write and submit project final report to UNDP-GEF/SGP</li> </ul>	50,000
Kavuko hills Rehabilitation Project	Aimi ma Kavuko FFS S.H.G	<ul style="list-style-type: none"> <li>-purchase working tools</li> <li>-dig two 3 km cut-off trenches</li> <li>-plant 50 trees in each members farm</li> <li>-plant 150,000 trees and 10,000 sisal in Kavuko hills</li> <li>-write and submit final report to</li> </ul>	25,118.00

		UNDP-GEF/SGP	
Kiumoni/ Kilome Environmental rehabilitation project	Kiumoni CBO	<ul style="list-style-type: none"> <li>-Purchase working tools</li> <li>-Desilt Kwa Muulu and Kiumoni dam</li> <li>-construct two masonry tanks</li> <li>-construct manholes</li> <li>-dig 3 km cut off trenches</li> <li>-construct two water kiosk/ cow cattle trough</li> <li>-fence off the 2 water course</li> <li>-plant 50 trees on each member farm</li> <li>-plant 10,000 trees in Kilome/ /Kilungu gazetted forest</li> <li>-write and submit the final report</li> </ul>	23,822,63
Kyundu hills Reafforestation project	Kyundu pollen youth group	<ul style="list-style-type: none"> <li>-Purchase working tools</li> <li>-purchase 420 PVC pipes</li> <li>-dig a trench up the hill</li> <li>-construct a water kiosk/cattle trough</li> <li>-plant 50 trees in each member farm</li> <li>-Plant 50,000 trees and 10,000 sisal on Kyundu hills</li> <li>-Desilt Kiongwani/Tumini dams</li> <li>-Purchase bee keeping equipment's</li> <li>-Write and submit the project report.</li> </ul>	34,125,17
Kaketa-River Rehabilitation project	Meko Ma Nduuka women Group	<ul style="list-style-type: none"> <li>-purchase working tools</li> <li>-Desilt 3 check dams (Nduuka,Kaketa,Kwa Mbisi)and plant sisal</li> </ul>	31,860,40

		<ul style="list-style-type: none"> <li>-Dig 2 km cut off trenches along the Kaketa and Kwa Mbisi check dam</li> <li>-construct 2 masonry tanks(Kakete&amp;Kwa Nduuka)</li> <li>-Plant 50 trees on individual farms</li> <li>-fence the 3 check dams water course</li> <li>-Write and submit the final project report</li> </ul>	
Mbuu dam Desilting Project	Thome wa Kiima s.h.g	<ul style="list-style-type: none"> <li>-purchase working tools</li> <li>-desilt Silanga Mbuu and Molumoni dam</li> <li>-fence Silanga Mbuu dam</li> <li>-construct a cattle trough</li> <li>-Construct a water kiosk</li> <li>-plant 50 trees in each members farm</li> <li>-dig trenches on members farms</li> <li>Write and submit the project final report</li> </ul>	16,519,65
Tree seedlings production	Wasyawa Tuvilani Women Group	<ul style="list-style-type: none"> <li>-Purchase working tools</li> <li>-Desilt Kyule dam/Katheka dam</li> <li>-construct manholes</li> <li>-fence the Kyule dam</li> <li>-plant 900,000 trees seedlings</li> <li>-construct water kiosk</li> <li>-construct two cattle troughs at Kyule Dam</li> <li>-plant 50 trees in each members farm</li> </ul>	30,873 ,59

<p>Usi-Unene River and Enzai dam Rehabilitation</p>	<p>Wema s.h.g</p>	<ul style="list-style-type: none"> <li>-Purchase working tools</li> <li>-construct Usi-Unene river Gabion check dam</li> <li>-dig 4 km cut off trenches</li> <li>-construct manholes</li> <li>-construct water kiosk and 2 cattle troughs</li> <li>-desilt and fence Enzai dam</li> <li>-plant 50 trees in each members farm</li> <li>write and submit the final project report</li> </ul>	<p>23,812,21</p>
<p>Kavuko Canal Reticulation project</p>	<p>Kavuko Youth Group</p>	<ul style="list-style-type: none"> <li>-purchase working tools</li> <li>-dig 2 collection gutters</li> <li>-dig 2 reticulation canals</li> <li>-dig 3 collection reservoirs</li> <li>-fence water course</li> <li>-plant 50 trees in each members farm</li> <li>-write and submit the final project report</li> </ul>	<p>20,508,33</p>
<p>Ndaatai hill Conservation project</p>	<p>Ndaatai CBO</p>	<ul style="list-style-type: none"> <li>-purchase working tools</li> <li>-dig 6 km cut off trenches at Ndaatai hill</li> <li>-plant 130,000 trees and 10,000 sisal at Ndaatai hill</li> <li>-plant 50 trees in each members farm</li> <li>-write and submit the project final report</li> </ul>	<p>22,350,00</p>

<p>Ngongo/Kwa Kikwu Gabion Project</p>	<p>Kavuko s.h.g</p>	<p>-purchase working tools -dig 3 km/cut off trenches -construct Ngongo check dam -plant 50 trees in each members farm -construct 5 gabions weirs along Ngongo and KwaKikwu gullies -Write and submit the final report to UNDP-GEF/SGP</p>	<p>30,239,57</p>
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Source: Small Grant Program Kenya (2006)

## 2.10 Theoretical Frame Work

A theory provides the basis for establishing the hypotheses to be tested in the study (Mugenda and Mugenda, 1999). A theory is a set of interrelated constructs, definitions and propositions that present a systematic view of phenomenon by specifying relations among variables, with the purpose of explaining and predicting the phenomena (Kerlinger, 1964).

### 2.10.1 Social Capital Theory

Putnam (2000): argues that 'Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them. This arguments suggests that communities endowed with diverse stock of social networks and civic associations are in a stronger position to confront poverty and vulnerability resolve disputes and take opportunities (Moser, 1996.Narayan, 1995, Isham, 1999)



For John Field (2003: 1-2) the central thesis of social capital theory is that 'relationships matter'. The central idea is that 'social networks are a valuable asset'. Interaction enables people to build communities, to commit themselves to each other, and to knit the social fabric. A sense of belonging and the concrete experience of social networks (and the relationships of trust and tolerance that can be involved) can, it is argued, bring great benefits to people

In times of crisis, people increase their efforts to diversify their assets and sources of income. But as social institutions are important channels of access, people divert surplus from investment in directly productive activities and direct management of production towards fostering loyalty, thus failing to maximize physical output. Investments in social institutions may be seen as a kind of "social overhead capital," the effective payoff to investment is very ephemeral and highly uncertain. What we face here is self-perpetuating circle: access via social identity leads to further investment in institutions as potential channels of access which in turn, direct more and more resources away from direct productive activities.

A social network can be defined as the norms and arrangements that enable people act collectively (Woolcock, 1998). This definition points to associations and socio-cultural institutions that govern these associations and also emphasizes the concept of trust and reciprocity in the associations. Putnam, (2000) observes that in a reciprocal relationship, each individual contributes to the welfare of others with an expectation that others will do likewise. This forms the basis of many mutual organizations including the self help groups. These features of social capital such as social norms and networks increase with use and diminish with disuse.

Obligations, expectations, and trustworthiness of structure are another form of social capital. If X does something for Y and trusts that Y reciprocates in the future, this establishes an expectation in X and an obligation on the part of Y. This form of social capital depends on two elements: trustworthiness of the social environment, which means that obligation, will be repaid, and the actual context of obligation held

(Coleman, 1998) Trust between individuals thus becomes trust between strangers and trust of a broad fabric of social institutions; ultimately, it becomes a shared set of values, virtues, and expectations within society as a whole. Without this interaction, on the other hand, trust decays; at a certain point, this decay begins to manifest itself in serious social problems. The concept of social capital contends that building or rebuilding community and trust requires face-to-face encounters. (Beem 1999: 20) It is the ability of people to work together for common purposes in groups and organizations. (Fukuyama 1995)

There is now a range of evidence that communities with a good 'stock' of such 'social capital' are more likely to benefit from lower crime figures, better health, higher educational achievement, and better economic growth (Halpern 2009b). However, there can also be a significant downside. Groups and organizations with high social capital have the means (and sometimes the motive) to work to exclude and subordinate others. Furthermore, the experience of living in close knit communities can be stultifying - especially to those who feel they are 'different' in some important way.

Social capital is important in community organization because it allows citizens to resolve collective problems more easily. People often might be better off if they cooperate, with each doing her share. Second, social capital greases the wheels that allow communities to advance smoothly. Where people are trusting and trustworthy, and where they are subject to repeated interactions with fellow citizens, everyday business and social transactions are less costly.

A third way in which social capital improves our lot is by widening our awareness of the many ways in which our fates are linked. When people lack connection to others, they are unable to test the veracity of their own views, whether in the give or take of casual conversation or in more formal deliberation. Without such an opportunity, people are more likely to be swayed by their worse impulses. The networks that constitute social

capital also serve as conduits for the flow of helpful information that facilitates achieving our goals. Social capital also operates through psychological and biological processes to improve individual's lives. Community connectedness is not just about warm fuzzy tales of civic triumph. Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together' (The World Bank 1999).

### **2.10.2 Lee Staple Theory**

Ross saw community organization as: a process by which a community identifies its needs or objectives, orders (or ranks) these needs or objectives, develops the confidence and the will to work at these needs or objectives, finds the resources (internal and/or external) to deal with these needs or objectives, takes action in respect to them, and in so doing extends and develops co-operative and collaborative attitudes and practices in the community. (Ross 1955) Community organizing is rooted in the belief that those who benefit least from current social, economic, and political structures have the greatest potential to build long-term, successful movements to change those structures.

Community organizing theory maintains that members of disenfranchised communities have the self-interest to build neighborhood-based organizations that can confront inequities that negatively affect neighborhood life. Community organizing groups bring people together to analyze local problems, develop solutions, and collectively pressure the public and private sectors to implement them. This work builds social networks between residents that directly benefit individuals in a variety of ways, and creates an avenue for ordinary people to influence public affairs. Organizing provides people with an opportunity to analyze and confront the inequities they face, and to create new paths to more equitable and just societal development. .

Just as an architectural blueprint is drawn with definite functions in mind, the methods used in any organizing drive are tailored to the kind of organization one is attempting to

create. Much of the Lee Staple model could be applied more broadly, but it's designed to build community organization with the following seven prescribed characteristics.

The model has generally has been used to organize low-and moderate –income people. The constituency is usually in a relatively powerless position vis-à-vis other segments of the society. The organizing is done on a geographic 'turf' basis rather than by specific issue or constituency. The multi-constituency approach includes all low –and moderate income people in a particular neighborhood not just one group of people such as women, farmers or teacher. However this mode is also applicable to single constituency organizing as well.

Issues (problems) arise from the people one is trying to organize not the organizer. People become involved when they're convinced that the organization can produce a change on some issue which is important to them. Thus people join organization, as they do other things, because they are motivated by a perceived self –interest. As Alinsky puts it “in the last analysis of our democratic faith, the answer to all of the issues facing us will be found in the masses of the people themselves. Membership is direct membership organization. People join as individuals of families usually by paying some sort of membership dues. (Not only monetary but ones participation or time)Members to the organization (group) are recruited through door-to-door contacts, leading to all organizational formation meeting.

The model puts emphasis on producing indigenous leaders who will operate through democratic decision making structures. The organizer needs to develop the leaders, as the direct membership model tends to produce leaders who've had little prior organizational involvement. Thus leadership development is critical to this model. The general philosophy expressed here is that leaders learn through direct experience. Such leader as this is critical to the membership's sense of own power and feeling of organizational ownership. This model produces neighborhood-wide organization in which the members choose their leaders directly through democratic election. The

organization is governed by a formal set of bylaws that define the rights and responsibilities of members and leaders.

Grassroots organizations need money to operate. How and where an organization gets funding will influence every facet of its operation. The Lee Staple model is based on the premise that “an action organization should not accept funding that compromises its ability to push for maximum social change”. Funds from sources that are potential targets come with “strings attached” that can be used to leverage control, containment, and cooptation and hence highly discouraged. Generally speaking, these eliminate most government and corporate sources. Exception might occur when an organization receives funding that is insulated from interferences and largely paid in advance, but even then an organization should be seduced into significant dependence on such funds.

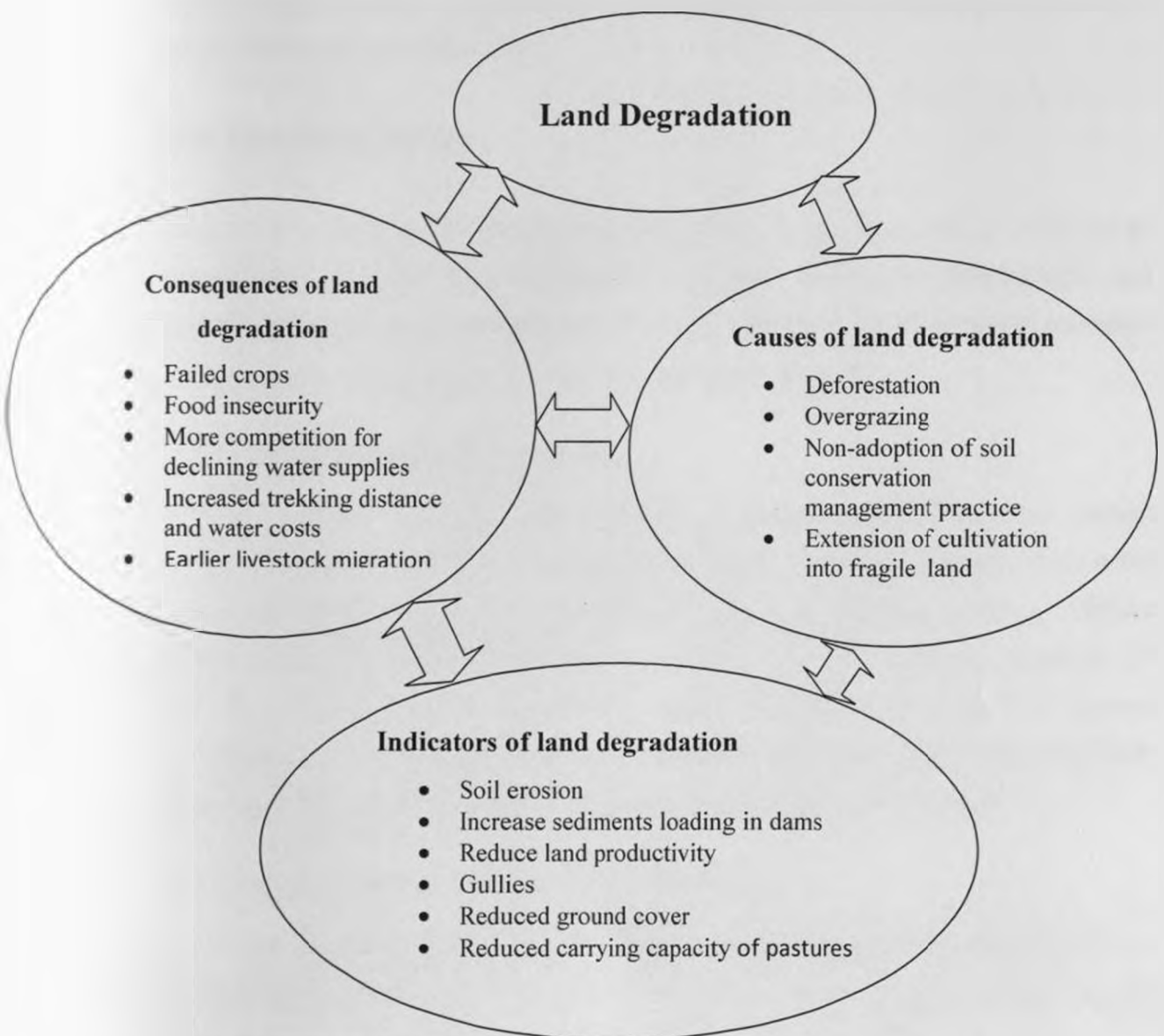
Social action organizations receive most of their funding either from the external sources or internal sources. It's desirable to raise as great portion of the budget as possible internally as this protects the organization from external interferences but, more importantly gives the membership a great sense of ownership. This model relies heavily on door-to-door recruitment; which requires major amounts of time since it's difficult to find unpaid volunteers with time, commitment, and skills to organize this intensively, part time volunteer organizer could make adjustment to this model to fit their own situations. There are many possible variations that work well, including one organizer working along a team of organizer trainees moving from house to house or a more permanent intensive staff. This is aimed at reducing staff salaries which are usually the largest organizational expense. This theory is relevant in community development studies.

## **2.11 Conceptual Framework**

Land degradation causes soil erosion which leads to loss in soil fertility and silting of the dams eventually food and water shortage. As result of these the rural community clears land that is steeply sloping, shallow and has easily erodible soils this further

causes fuel wood shortage and more land degradation. The resultant problems related to land degradation include gullied land, deaths and injuries as a result of failing in gullies, floods on the lower lands, reduced ground cover, failed crop harvest and limited drinking water. Since the rural community depends directly on health of the natural resource base, as a result of a decline in this natural resource base the community engages in uncontrolled sand harvesting and charcoal burning which further leads to more and more land degradation

Figure 1.0 Land Degradation Conceptual Framework



## **CHAPTER THREE**

### **3.0 METHODOLOGY**

#### **3.1 Introduction**

According to Singleton e al (1988) research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to research purpose with economy in procedure. This chapter describes the procedures that were followed in conducting the study.

#### **3.2 Site Description**

This section provides the background description of the study area in terms of its geographical location, area, administrative locations, and main physiographic and natural conditions. It also presents the settlement patterns of the division and also takes into account the socio-economic activities carried out in the area.

##### **3.2.1 Administrative Boundaries**

Kilome division is located in Mukaa District in Ukambani Region in the lower Eastern Province. The division borders Kajiado central district to the west, Kajiado south to the south, Machakos to the north, and Mbooni district to the East. (Makueni District Development Plan 2008-2012). It lies between latitude 1° 35' south and longitude 37° 10' east and 38° 30' east. The division covers an area of 359.4 km<sup>2</sup>.The division comprises of (3) three locations namely Kiima-Kiu, Katai and Kasikeu.The GEF/SGP land degradation rehabilitation cluster project occupies an area of 40.8 km<sup>2</sup>.

##### **3.2.2 Physiographic and Natural Conditions**

The major land formations in Kilome Division include Kilungu Hills, which lie on the northern part of the division and rise to a height of 1,900m above sea level, Kyundu

hills, which lie on the north eastern part of the division, Ndaatai Hills and Kavuko Hills which lie on the central part of the division. The southern part of the division is low lying grassland, which receives little rainfall but has an enormous potential for ranching. The northern part of the division is hilly with medium rainfall but has potential for crop production. The Kilungu area has the Kilungu gazzeted forest which is a natural forest. This area is suitable for coffee, horticulture and dairy farming. ([www.aridland.go.ke](http://www.aridland.go.ke))

The division experiences two rainy seasons, namely: the long rains occurring in the March/April while the short rains occur in November/December. The hilly parts of the division receive 800-1200mm of rainfall per year. The lower areas which include the Kavuko area are relatively dry and receive low unreliable amounts of rainfall of about 500 mm per annum (Makueni District Development Plan 2008-2012).

There are two main rivers in the division namely Kaketa and Usi-Unene which flow from the Kilungu hills but their flow becomes irregular as they move to the low-lying areas. Climate variations and extreme differences in temperatures can be explained by change in the altitude. To the north, it is usually cool while, in low lying areas of the south, it is usually hot. During the dry periods that are between May and October the lower parts of the division experience severe heat. The northern parts of the division have low temperatures especially in the hilltops. This is due to the forest and windy conditions that exist in this area. The mean temperature ranges from 20.2°C to 24.6°C averaging at 22.1°C (Makueni District Development Plan 2008-2012)

### **3.2.3 Settlement Patterns**

According to the 2009 population and Housing census Kilome division registered a total population of 63,856. The study area is fairly populated. The highest concentration of people is in the hilly areas of the division which are rich in the natural resource potential while less concentrations are in the low-lying areas



### **3.2.4 Socio-economic Activities**

The average household size is 6 and the absolute poverty level in the area is 64% (Kilome Constituency Strategic Plan 2007/2012). Agriculture contributes to 75% of the household income while rural self-employment contributes to 15%, urban self-employment 8% and others 2%. The main food crops produced in the area include: maize, beans, cow peas and pigeon peas while the main cash crop grown in the area is coffee. The main livestock reared in the area include cows, goats, sheep and donkeys. Poultry is also undertaken with main players here being chicken, ducks, and turkey. Sand harvesting is a major economic activity and provides 80% the local council's revenue.

Kilome division GEF/SGF land degradation cluster project was chosen because Kilome division is one area that has experienced massive land degradation for a very long time and the community had come together to try and reverse the situation. The study sort to study the interventions applied by the community to reduce land degradation: and whether the interventions carried out could work in other communities under similar circumstances. Since the project was winding up, it was also important to carry out an evaluation on the progress made by the community, lessons learnt and the challenges that the community had encountered while implementing the various interventions. The project is clustered in one geographical area and this greatly reduced on time and resources spent while carrying out the field study.

### **3.3 Target Population**

According to Brinker, (1988), target population is defined as the whole population from which a sample is to be selected. The target population in the this study was adults (male and female) aged over 18 years married or unmarried who are general community members within the study area in Kilome Division, Mukaa District.

### **3.4 Unit of Analysis**

Unit of analysis is described as “that which the study attempts to understand” (Babbie, 1995:193). It is therefore the entity (object or event) about which the researcher gathers information. In this study the units of analysis were community members within the project area and groups carrying out the GEF/SGP land rehabilitation project in Kilome Division

### **3.5 Unit of Observation**

Unit of observation is the subject, object, item or entity from which we measure the characteristics or obtain the data required in the research study (Mugenda and Mugenda, 1999) the unit of observation in the study were the activities community members were involved in i.e. the interventions aimed at reducing land degradation.

### **3.6 Sampling Design**

Sampling is selecting representative from the universe or the selection of few elements out of the entire population. From the above described population, probability and non-probability sampling techniques were used to select various samples to be included in the study.

A total of 107 respondents were interviewed in 107 households in the seven villages in the study area. To select a sample size of 107, non-probability sampling method was used. Specifically the research team split into two groups of two's and took transect walks in different directions, volunteer sampling technique was used where any willing adult (both male and female) were randomly interviewed within the study area. Those unwilling to be interviewed cited busy schedule and others said they were not involved in the projects and were replaced by a willing respondent in the next closest household.

Purposive sampling was employed to select five groups out of the ten groups undertaking the GEF/SGP land rehabilitation projects. The groups were picked on basis of gender and or the nature of the activities undertaken and/or the age composition of the group members. Purposive sampling is where the researcher purposively chooses the units because in the researchers opinion those units are relevant for the study. This method of sampling was to target key informers and groups carrying out GEF/SGF Co-financed funded project in the division.9 key informants were selected through purposive sampling.

The groups were picked based on either gender of most members and/or the age bracket of the group Meeko ma Kwa Nduuka W.G was picked because it was a women group whose membership is made up of elderly women and it main activity was construction of check dams. Kavuko S.H.G was selected because it main activity was building gabions and digging cut off trenches and membership was made up of both male and female, with majority aged over 35 years.

Wasya wa Tuvilani W.G was picked on the basis that it was a women group and also the only group that was to plant tree seedlings. Thome wa Kiima S.H.G was selected because it main activity was to desilt the Silanga Mbuu Dam, while Kyundu Youth Pollen was picked because it was a youth group and the only group doing the canal reticulation.

### **3.7 Methods and Tools of Data Collection**

#### **3.7.1 Methods of Data Collection**

Both qualitative and quantitative methods were used to collect data. Methods used to gather data included: focused group discussions, key informant interviews, household interviews and observation. The study benefited from both primary and secondary sources of data. The primary data was sourced by targeting households where the GEF/SGF projects were within their neighborhood, using; questionnaires, observations

and face to face interviews. Interview guides were used to obtain information from Key informants. Primary data was also obtained from FGDs using the focused group discussion guide.

Secondary data was collected from published literature that included: GEF/SGP electronic websites, books, KID baseline reports(2005/2006),KID project proposal(2005), group progress reports, Makueni district development plans, Kilome Constituency Strategic plan, journals, and as well as some unpublished literature.

### **3.7.2 Tools of Data Collection**

The following tools of data collection were used in the study.

#### **3.7.2.1 Questionnaire**

To conduct the household interviews a total of 107 questionnaires were used (appendix 1). Questionnaires are a list of questions given to the respondents to use. Open ended questions were used this allowed the researcher to capture the respondent's personal views that might not be obtained using closed questions. The questionnaires were used to obtain important information on the nature of community participation in the land degradation project, to establish the benefits the community gained from participating in the project and also to highlight the various challenges the community encountered while carrying out the various interventions

The questionnaires were written in English but during the administration of the same, local language (Kiikamba) was used to translate to the respondents. The responses were also given in local language but translated into English by the research assistants/researcher. This ensured flow of information and originality from the respondents' side, this was to take care of those respondents who were not literate or whose English language was limited. The information consent was requested of each respondent before commencement of participation in the study.

### **3.7.2.2 Interview Guide**

A total of 9 key informants were interviewed. Interview guide is a set of questions aimed at directing the flow of a discussion to desired goal. Mikkelsen (205:169) describes qualitative interview as a process whereby only some of the questions and topics are predetermined. Many questions were formulated during the study; an interview guide was used (appendix 2) to address information from key informants. Key informants are people with specialized professional background on issues being explored in the study. They are also people who have a key role to play in the community and ready to discuss matters of the community. In this study the key informants included: Divisional Officer Kilome Division (DO), Divisional Social Development Officer (DSDO), Divisional Agricultural Officer (DoA), Divisional Forestry Officer, Chiefs Kavuko and Mukaa locations, Coordinator Kenya Initiative for Development (KID) and a village elder from Kavuko village. The interview guide contained questions that enabled the researcher, to probe in order to clarify issues, and to facilitate collection of qualitative data on the nature of community participation in the land degradation rehabilitation project, the benefits the community gained from participating in the project, the challenges that the community faced while carrying out the various interventions and to establish the roles the various stakeholders in the project.

### **3.7.2.3 Focused Group Discussion Guide**

A total of 5 focused group discussion guides were used in the study. Focused group discussions (FGDs) were conducted with 5 CBO/groups undertaking GEF/SGP land degradation rehabilitation project in the division. In all the focused group discussions there was a moderator identified from the area. The focused group discussions were very resourceful, issues discussed included; the various ways the groups participated in the project, the benefits of the project to the community, the interventions the groups were to undertake to reduce land degradation in regard to GEF/SGP Co-financed projects, the interventions they had carried out, those they failed to undertake. The

stakeholders in the project, the challenges the community was facing as a result of land degradation, what they were doing to counter these challenges, role of women in the project, constraints faced and effects of land degradation on access to water and food security.

#### **3.7.2.4 Observation Guide**

The study also used direct observation method. This method allows the researcher to directly observe social phenomena in a natural setting (Babbie, 1995:230) this method was used to observe: physical, social and economic context which the respondents live; types of land degradation, what the groups were doing to mitigate land degradation, social economic activities carried out in the area and land use in the area. An observation guide was used to write what was observed. Some of the phenomena observed photographs were taken.

## CHAPTER FOUR

### 4.0 DATA ANALYSIS AND PRESENTATION

#### 4.1 Introduction

This chapter presents the data collected and puts together major findings with the focus being on the main objectives of the study. It gives the findings from the household questionnaires, key informants, FGDs and other observations that were encountered during the fieldwork.

#### 4.2 Background Information

##### 4.2.1 Gender distribution

Table 4.1: Number of Respondents interviewed according to sex

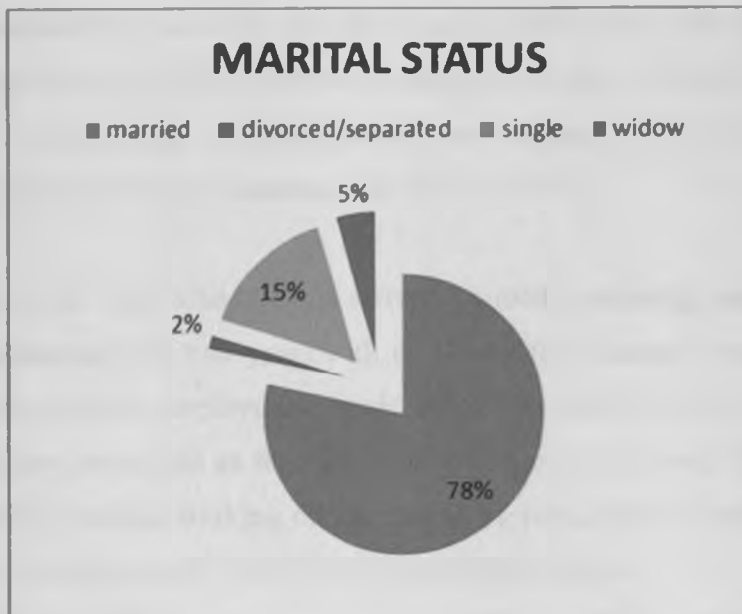
Gender	Frequency	% of Total
Male	56	52.3
Female	51	47.7
<b>Total</b>	<b>107</b>	<b>100.0</b>

From the table 4.1 above, its indicated that most of those interviewed were male 56 (52.3 %) and 51(47.7%) were female.

##### 4.2.2 Marital Status

From the pie chart Fig 4.0 most respondents interviewed were (78%) married, (15%) single, (5%) widowed and (2%) divorced/separated. This shows that the results obtained from the study area were most likely from the people who were mature and had lived in that region long enough to witness changes in their environment.

Fig 4.0: Percentage Distribution of Respondents by Marital Status



### 4.2.3 Level of Education

Table 4.2: Percentage Distribution of the Respondents by Highest Education Level Completed

Highest Level of Education Completed	Never attended school	Primary	Secondary	College	Total
Number of Respondents	10	62	30	5	107
% of Total	9.3	58	28	4.7	100.0

Table 4.2 above, gives the level of education completed by the respondents. 62(58%) completed primary education, 30(28%) secondary, 5(4.7%) college while 10(9.3%) had never attended school. It shows that most of the participants in projects aimed at reducing land degradation are to the level of primary education at 58%. This is significant in that when sensitizing the community about land degradation issues, either local language should be used or best language that can be understood by a lay man .The



educational level of the participants had a direct impact on how the projects were carried out. As indicated by one key informant many of the group officials failed to attend group donor meetings shying off due to language barrier. This had direct effect to the projects as some groups also maintained poor progress records leading to delays in receiving subsequent disbursements from the GEF/SGP.

According to the work schedule, the activities aimed at reducing land degradation were to run continuously for two years with no breaks this therefore meant that only those with no meaningful employment could afford to work in the projects. The little allowance they were paid as food for work was a big incentive to the members of the community to continue working on the various projects, the little they earned was used to meet the family's needs. One key informant indicated that,

*“One of the groups whose members were formally employed, and had no time to work on the project had to hire members of the community to work on their assigned projects”.*

#### 4.2.4 Sources of Livelihood

**Fig 4.1 Main sources of livelihood of the Respondents**

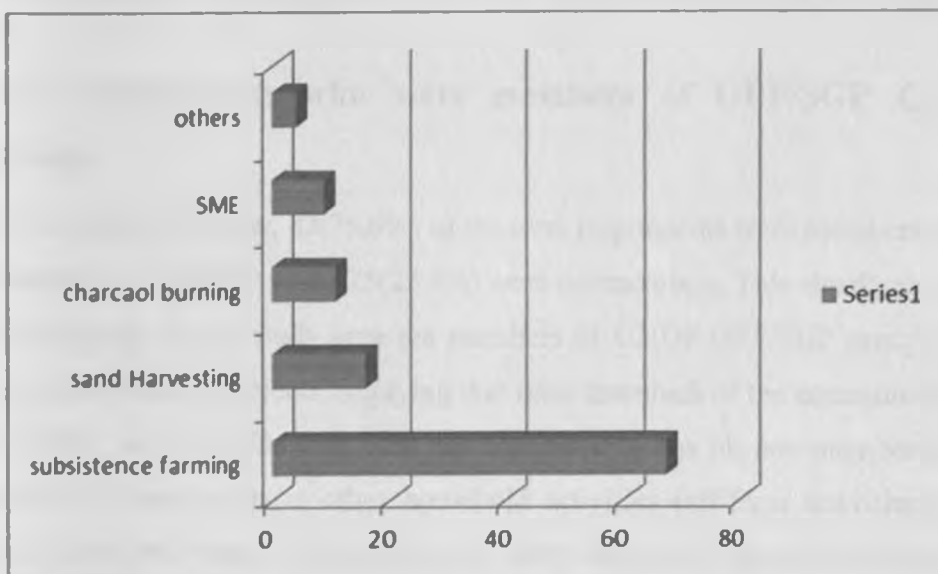


Figure 4.1 above shows the main sources of income of the respondents. Overall 67(62.6% of the respondents earn their income from subsistence farming, 16(15.0%) from sand harvesting, 11(10.3%) from charcoal burning and 9(8.4%) small scale business. Subsistence farming is the key source of income for the respondents. Sand harvesting and charcoal burning which lead to land degradation continue to be important sources of income in the area.

#### 4.2.5 Religious Affiliation

Table 4.3: Different Religions Practiced by the Respondents as a Percentage of the Total

Religion	Christians	Traditional	Muslims	Total
No. of respondents	97	8	2	107
% of the Total	90.6	7.5	1.9	100

From table 4.3 above, 97(90.6%) of the respondents practiced Christianity, 8(7.5%) traditional religion and 2(1.9%) practiced Islam religion.

### 4.3 Membership to the GEF/SGP Co-Financed Groups

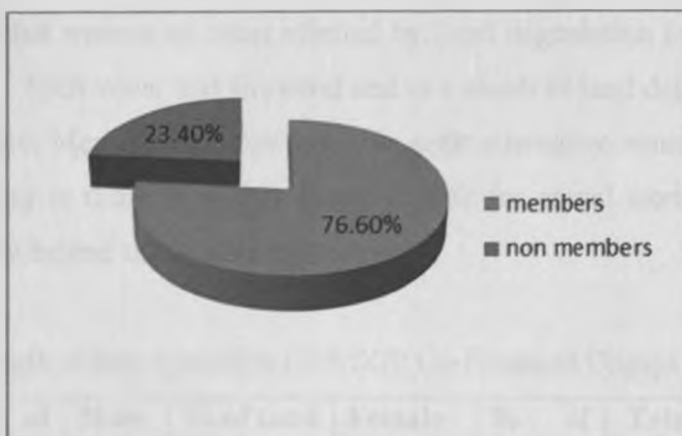
#### 4.3.1 Respondents who were members of GEF/SGP Co-Financed groups

In the figure 4.2 below, 82(76.6%) of the total respondents were members of CBOs Co-financed by GEF/SGP while 25(23.4%) were nonmembers. This clearly shows that most of the people in the study area are members of UNDP-GEF/SGP groups undertaking land rehabilitation projects, implying that most members of the community had interest in dealing with the effects of land degradation. Reasons for non-membership included: personal commitments in other household activities (off-farm activities) for instance small scale businesses, others said they were not aware when the groups were being formed or were away when the recruitment was being done. From the FGDs held with

formed or were away when the recruitment was being done. From the FGDs held with the groups most of the groups did not recruit new members. This was a sentiment supported by most of the key informants. One of the key informants had this to comment,

*“Many groups did not admit new members into their groups; groups did not want to recruit new members as they feared the money they received as food for work would greatly reduce”*

Fig 4.2: Proportion of Respondents who are members’ of GEF/SGP Co-Financed Groups



Members exited the groups either on their own will or were expelled from the groups if they failed to abide by the groups by-laws. In most cases if one left voluntarily, the groups replaced the exiting member with another member from the nuclear family. For example if one exited the group due to sickness or old age the first priority was given to the close family members of the exiting member. From the group records majority of the groups did not recruit new members in their groups and this led to hatred and conflicts among the members and non-members of the groups.

From my personal observation it was clear that some non-members had interest in joining the groups. However from the FGDs there was a general feeling among some groups that recruiting new members in the groups would reduce the wages (food for

work) that they were being paid. Other groups like Wasya Wa Tuvilani, Aimi ma Kavuko F.F.S which had been formed prior to the UNDP-GEF/SGP projects being initiated in the area were not comfortable bringing new members on bond. There were isolated cases where some of the members had multiple memberships in the various GEF/SGP Co-financed groups.

### 4.3.2 Duration of Membership in GEF/SGP Co-Financed Groups

From the household interviews 47(57.3%) females and 35(42.7%) males were members of groups undertaking the GEF/SGP land rehabilitation projects (table 4.4 below). There were more females than males in the groups supported by GEF. This can be associated with the fact that women are most affected by land degradation for instance it the duty of women to fetch water and firewood and as a result of land degradation the two had become scarce. Men on the other hand can seek alternative sources of livelihood like sand harvesting or move to nearby towns to look for casual work unlike women who have to remain behind taking care of the homes.

Table 4.4 Length of Stay (years) in GEF/SGP Co-Financed Groups According to Sex

<b>Duration of membership (years)</b>	<b>Male</b>	<b>% of total</b>	<b>Female</b>	<b>% of total</b>	<b>Total</b>	<b>% of total</b>
1-5	9	11.0	16	19.5	27	31.8
6-9	6	7.3	10	12.2	15	17.6
>10	20	24.4	21	25.6	43	50.6
<b>Total</b>	<b>35</b>	<b>42.7</b>	<b>47</b>	<b>57.3</b>	<b>85</b>	<b>100.0</b>

From table 4.4, 43(50.6%) of the respondents had been participating in activities aimed at reversing land degradation for more than 10 years this shows that the study area has been experiencing environmental degradation for a long time, and members of the community had been using their own indigenous knowledge to deal with land degradation related problems on a smaller scale without external funding. For instance

Wasya wa Tuvilani W.G started planting tree seedlings in the year 1997 while Kavuko S.H.G has been repairing roads destroyed by surface runoff and gullies since 1998.

## **4.4 Evaluation of the Land Degradation Rehabilitation Interventions**

In recognition of the adverse impacts of land degradation, the people of Kilome division with the assistance of GEF/SGP set up several interventions to control land degradation in the area. The groups included: KID as the lead NGO, Aimi ma Kavuko FFS, Kiumoni CBO, Kyundu Pollen Y.G, Meko ma Kwa Nduuka W.G, Thome wa Kiima S.H.G, Wasya wa Tuvilani W.G, Wema S.H.G, Kavuko Y.G, Ndaatai CBO and Kavuko S.H.G.

The interventions undertaken were appropriate for the study area because the area is hilly and has suffered from land degradation for many years. The community was satisfied with the interventions implemented because there have been benefits observed. For instance some gullies are now vegetated and water is easily available as result of the check dams built and the desilted dams. From the household interviews, FGDs and key informants interviews and from my personal observations, the following interventions were implemented.

### **4.4.1 Water Harvesting**

#### **4.4.1.1 Building Check Dams**

From the FGDs and the KID baseline reports a total of 5 check dams were to be built (table 4.5 below). These check dams included: Kwa Nduuka check dam along the Kaketa River and 3 gabion check dams along the Usi-Unene River and a check dam along the Ndunyuni Gully built by Kavuko Y.G was a diversion from the ToR. From the FGD this group initially was set out to build reticulation canals on Ndunyuni hills but the project was abandoned because the piece of land where the canals were to be done was communally owned, sloppy and gullied and was not environmentally feasible.

Table 4.5: The status of the various check dams built by three groups

Group	Check Dam (Target)	Done	Undone
Kwa Nduuka W.G	Kwa Nduuka	✓	0
Wema S.H.G	3 Check Dams along Usi –Unene River	✓	0
Kavuko Y.G	Ndunyuni Check Dam	✓	0
<b>Total</b>		<b>5</b>	<b>0</b>

From the household interviews, FGDs, Key informants interviews and personal observation all the 5 check dams had been completed. The photo 4.1 below shows the check dam constructed by Meeko Ma Nduuka W.G while photo 4.2 on the next page shows the check dam constructed by Kavuko Youth S.H.G along the Ndunyuni gully holding surface runoff

Photo 4.1: A check dam constructed by Meeko Ma Kwa Nduuka W.G at Kwa Nduuka along the Kaketa River



From my personal observation Ndunyuni check dam was completely filled with surface runoff after one night's rains. There is need therefore to do more check dams along the

gully to accommodate the overflow and reduce pressure on the already existing check dam.

Photo 4.2: Ndunyuni Check dam holding surface run off. constructed along Ndunyuni Gully by Kavuko Youth S.H.G



#### **4.4.1.2 Desilting Existing Dams**

A total 11 dams were to be desilted by six groups shown in table 4.6 below. From the FGD, group progress reports, information obtained from the key informants and personal observation, 5(41.7%) of dams were either completely desilted, 2(16.7%) were partially desilted while 5(41.7%) of the dams were not desilted. Table 4.6 shows the status of each dam. Wasya wa Tuvilani W.G and Kiumoni CBO completely desilted 3 dams. Reasons given by these groups for their success included: cohesive groups, good group leadership and community members who were very cooperative and willing to fully surrender their land and the funding provided by GEF/SGP which was used by groups to buy the working tools to desilt the dams and also pay (food for work) to those who worked in the dams.

Table 4.6: The status of the various dams to be desilted by the groups

Group	Dam	Completed	Uncompleted	Undone
Kiumoni CBO	Kwa Muulu dam	√		
	Kiumoni shallow well	√		
Thome wa Kiima	Kavilika			√
	SilangaMbuu		√	
Meko ma Nduuka W.G	Kaketa			√
	Kwa Mbisi		√	
	Kwa Nduuka	√		
Wema S.H.G	Enzai	√		
Wasya wa Tuvilani W.G	Kyule	√		
	Katheka			√
Kyundu Hills Y.P.G	Kiongwani			√
Kyundu Hills Y.P.G	Tumini			√
<b>Total</b>		<b>5</b>	<b>2</b>	<b>5</b>

Source: Group Progress Reports.

Both internal and external factors contributed to groups' failure to meet the intended targets. Internal factors raised by the groups included: poor group leadership, uncooperative members of the groups and misappropriation of funds by the group officials. While external factors included: land owners denying members of the group access to the dams because the dams are privately owned. This was the case of Kaketa and Kwa Mbisi dams. This could be as a result of poor sensitization of the projects dam owners felt once the dams are desilted the groups would eventually take over the management of the dams. The Kaketa dam was not desilted because the dam had also been funded by Constituency Development Fund (CDF).



Photo 4.3: Silanga Mbuu Dam Desilted partially by Thome Wa Kiima S.H.G



Desilted sand

silt

water

From the respondents interviewed and personal observation the dams that had been partially or fully desilted held water for a longer period of time as compared to those that were not desilted this is because the silt in the dams reduces the amount of water held in the dams. From my personal observation Enzai dam which Wema group was working on was dry while Silanga Mbuu dam that was partially desilted by Thome was Kiima S.G had substantial amount of water. Photo 4.3 above shows the Silanga Mbuu dam holding water.

#### 4.4.2 Building Gabions

Five gabions were to be constructed along the Ngongo/Kwa Kikwu gullies by Kavuko S.H.G and one along the Usi-Unene River by Wema S.H.G. From the FGDs held Kavuko S.H.G constructed 8 gabions while Wema S.H.G constructed three gabions along the Usi-Unene River. Aimi ma Kavuko F.F.S on the other hand constructed 4

gabions instead of planting trees (table 4.7 below). The group cited the long drought as the reason why they did not plant trees. The gabions were aimed at controlling soil erosion, by slowing the water velocity, thus preventing further expansion of gullies and reclaim the land lost through gully formation by changing the gullies to valleys and allowing the vegetation to grow. The gabions would also raise water levels used by the local community. Photo 4.4 on the next page shows one of the gabions constructed by Kavuko S.H.G. According to information given by a Key informant Kavuko S.H.G did not follow the set standards in constructing the gabions and they risked being swept away in case of heavy rains.

Table 4.7: Number of Gabions built by the groups

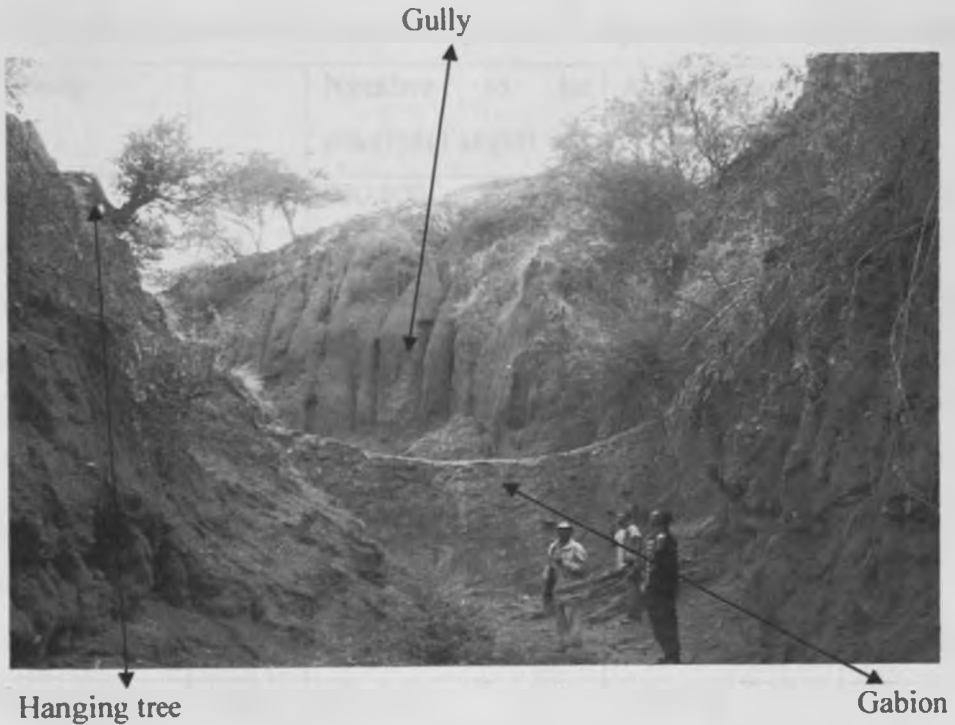
Group	Location of the Gabions	Target	Actual	% success
Kavuko S.H.G	Ngongo/Kwa Kikwu Gully	5	8	160
Wema S.H. G	Usi-Unene River	3	3	100
Aimi Ma Kavuko F.F.S	Ngongo/ Kikwu Gully	0	4	0
<b>Total</b>		<b>8</b>	<b>15</b>	<b>187.5</b>

Source: Group status reports

From my personal observation some of the gabions had very weak foundation and were already cracking. In future expertise need to be sort in constructing the gabions to ensure that they are durable and constructed according to the required standards rather than relying on the local community which might not be possessing the right expertise. Reasons for the success by the groups included: good group leadership, availability of working tools, funds to purchase the constructing materials, the food for work incentive and cooperation from the farm owners.

Other challenges cited by the groups included; financial misappropriation by some group members, group conflicts, steep and rocky terrain that made it very difficult to carry the heavy construction materials down the gullies.

Photo 4.4: A Gabion constructed by Kavuko S.H.G on Ngongo/Kwa Kikwu gully



#### 4.4.3 Reafforestation

According to the TOR, 5 groups were to plant trees and/or sisal on various hills, Kilungu forest and in their individual farms, as indicated in table 4.8 on the next page. Aimi ma Kavuko F.F.S was to plant 150,000 trees and 10,000 sisal plants on Kavuko and Kilele hills, Kiumoni CBO was to plant 10,000 trees in Kilome/Kilungu gazzetted forest, Kyundu Pollen Youth Group was to plant 50,000 trees and 10,000 sisal plants on Kyundu hills, while Ndaatai CBO was to plant 130,000 trees and 10,000 sisal plants on Ndaatai hills. All members of the groups were to plant at least 50 trees in their farms being their own contribution to the project.

Wasya wa Tuvilani W.G was to plant 900,000 tree seedlings and supply them to the four groups and to all the group members participating in the GEF/SGP projects. The objective of planting trees was to green the area, control soil erosion; provide cheap fuel wood, herbal medicine and boost honey production in the area.

Table: 4.8 Actual Number of Trees/Sisal planted compared to the target for each group.

Group		Number to be planted(Target)	Actual planted	Deficit	% of success
Wasya wa Tuvilani W.G	Trees	900,000	500,000	-400,000	55.6
	Sisal	0	0	0	
Aimi ma Kavuko F.F.S	Trees	150,000	0	-150,000	0
	Sisal	10,000	35,000	+25,000	350.0
Kiumoni CBO	Trees	10,000	3000	-7,000	30.0
	Sisal	0	0	0	0.0
Kyundu Pollen Youth Group	Trees	50,000	0	-50,000	0.0
	Sisal	10,000	80,000	+70,000	800.0
Ndaatai CBO	Trees	130,000	130,000	0	100.0
	Sisal	10,000	5000	-5000	50.0

Source: Group Progress Reports

Out of the 15 household farm owners interviewed only 3(20%) said that they had planted at least 50 trees in their farms, 5(33.3%) had planted less than 50 trees while 7(46.7%) had not planted any trees in the farms. However it was difficult to physically establish number of trees planted in the farms since many of those planted had dried up due to the long drought in the area. Those that planted the 50 trees in their farms were members of Wasya wa Tuvilani W.G and Meeko Ma Kwa Nduuka W.G which had tree seedbeds and it was compulsory that their members plant trees in farms.

Photo 4.5 below shows Wasya wa Tuvilani tree nursery. The two groups had also been trained by the Kenya forest service on the importance of trees therefore they put a lot of emphasis on this activity. Members of the other groups reported they were afraid that trees would dry up because there was drought in the area.

Photo 4.5: A member of Wasya wa Tuvilani attending tree seedlings in the one of the group tree nursery



Both local and exotic trees were planted by members of the groups. The indigenous plants include acacia and sisal trees while the exotic trees included: caliandra, gravelia, eucalyptus. Fruit trees including mangos, oranges and paw paws had also been planted for food security. The groups that were to plant trees on the hilltops mainly choose to plant sisal which is drought resistance. According to one key informant, Ndaatai CBO choose to broadcast seeds on the hilltops and along the cut off trenches rather than plant the seedlings, the seeds that geminated and survived were doing well. Ndaatai hilltop is greener compared to Kyundu and Kavuko Hills where no trees were planted and community members are getting fodder for their animals a sentiment supported by three of the key informants. The long drought in the area greatly discouraged the farm owners from planting trees.

Members of the community should be encouraged to broadcast seeds in the farms in the cut off trenches where water is retained for a longer time and the survival rates of the trees are higher. From the FGDs, groups' progress reports and key informants it was evident that the groups did not plant the required number of trees as per the set target, this is discussed further in the chapter. It should be noted that groups that planted sisal rather than trees did quite well and they surpassed their targets as shown on Table 4.8.

#### 4.4.4 Digging Cut-off trenches/Terraces

Initially a total four groups were to carry out this activity. These groups included: Aimi ma Kavuko F.F.S which was to dig a 3 km cut-off trench on Kwa Kalili and Nduyuni hills. Kiumoni CBO was to dig 4 km cut-off trench on Kilome/Kilungu hill to control surface run-off, Meeko ma Kwa Nduuka W.G was to dig a 2 km cut off trenches on Ikomoa and Kamwilani hills while Ndaatai CBO was to dig a 5 km cut-off trench on Ndaatai hill. When it became difficult for Kavuko Y.G to build the reticulation canals because the land was not environmentally feasible and Wasya wa Tuvilani could not desilt the Katheka dam because it was privately owned the two groups did the cut-off trenches instead.

Table 4.9 Cut off trenches dug by the groups versus the targets given

Group	Target(km)	Actual(km)	% of success
Aimi ma Kavuko FFS	3km	3km	100%
Kiumoni CBO	3km	4km	133%
Meeko Ma Kwa Nduuka	2km	2km	100%
Ndaatai CBO	6km	5km	83.3%
Kavuko Y.G.	3km	3km	100%
Wasya wa Tuvilani	4km	4.4km	110%

Source: Group Report

Kavuko Youth S.H.G dug a 3 km terraces on Kavuko hills while Wasya wa Tuvilaini dug 4.4km trenches on its member's farms. From the FGDs 5(83.3 %) of the groups dug

the required length of the cutoff trenches, 1(16.7%) of the groups failed to meet the required length.

Photo 4.6 below shows one of the cut off trenches dug by Meeko ma Kwa Nduuka W.G holding no water while photo 4.7 shows a cut off trench dug by Kavuko S.Y.G holding surface runoff. One key informant said that the trenches have helped reduce the speed of water and hence reduced soil erosion.

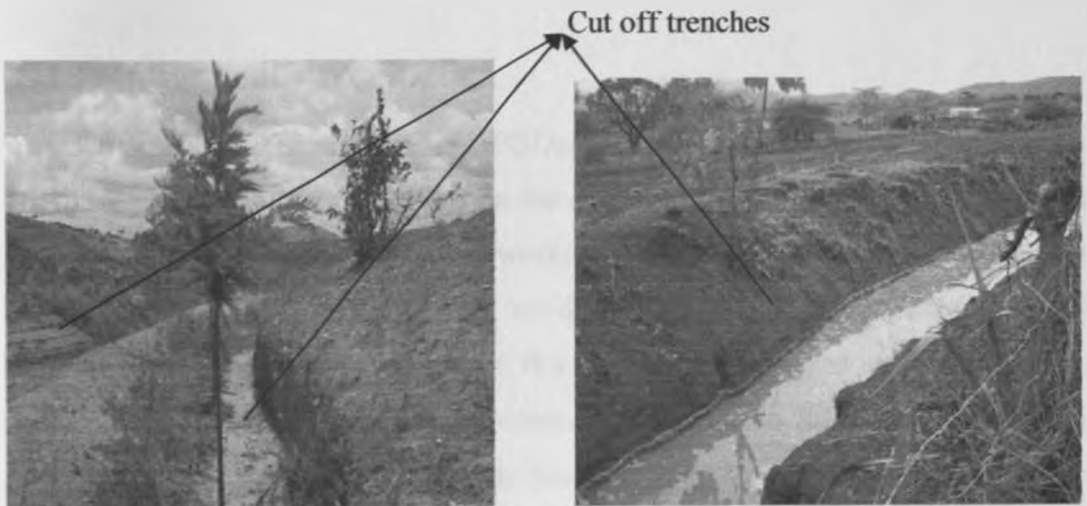


Photo 4.6: Cut off trench dug by Meeko Ma kwa Nduuka W. G

Photo 4.7: Cut off trench dug by Kavuko S.H.G holding surface run off

The groups' attributed their success to cooperation they received from the members of the community, working tools bought by GEF/SGP and the technical advice they received from the ministry of Agriculture.

#### **4.4.5 Promoting Agricultural Activities.**

Meeko Ma Nduuka and Wasya Wa Tuvilani women groups also focused on promoting agricultural activities through micro-irrigation using the flood water collected in the check dams and gabions. From the FGDs the members of Meeko Ma Nduuka used the water from the Kwa Nduuka Check dam to plant their own tree seedlings and Kales, while Wasya wa Tuvilani used the Kilimanjaro pumped water to plant fruit trees and

vegetable for their own consumption and that of their neighbors. This boosted their diet and increased their earnings from the sale of the same. Kyundu Youth group constructed a water Kiosk that they used to sell water to the members of the community. The group also had built cattle drinking troughs where animals came to drink water.

## **4.5 Participation in the Project**

### **4.5.1 Frequency of Participation**

From the household interviews and FGDs held the number of days a respondent participated in the projects depended on the nature of the project or activity. From the group discussions, the group members worked on the project for three days in a week. Out of the three days they were paid for two days and the third day they were not paid as this was their contribution to the project. If a member was engaged in other activities at home one was required to send a representative to work on his or her behalf. While watering tree seedlings was done on daily basis, digging the cut off trenches respondents were assigned portions, if one completed his or her portion then one was free to go home or one would request to do another portion until the marked area for the day was completed.

For the construction works like building of gabions and check dams members of the community engaged themselves in a specific site until the work was completed with some breaks in between to allow the cement to dry.

Non-members of the groups were also involved in the implementation of the interventions and were paid some small allowance as food for work. From the FGDs some duties were also assigned according to gender and age of an individual, the less tasking activities for instance: watering seedlings, carrying ballast, putting soil into polythene bags and making tea were assigned to the women and the elderly men while construction, carrying cement and big stone downhill was done by men.



## **4.5.2 Forms of Community Participation**

From the FGDs and personal interviews it was indicated that members of the community contributed to the project in one or several forms of the following:

- a. Labour; and /or
- b. Land; and/or
- c. Materials; and/or
- d. Management

### **4.5.2.1 Labour**

In terms of how the respondents participated in the projects, labour was ranked highest by the respondents. The various activities the respondents were involved in included: digging the cut-off trenches/terraces, constructing the check dams and gabions, planting and watering the trees seedlings, desilting the silted dams, carrying the building materials to the sites, honey production, and gathering seeds. Those who participated in the projects were paid some daily allowance as food for work.

### **4.5.2.2 Land**

Members of the community donated land where the interventions were carried out; this includes a piece of land where the Kavuko Community Conservation Center is built, which was donated by Konza Ranch and Farming Co-operative Society. The center is used by the stakeholders and groups hold their meetings. At the center Wasya Wa Tuvilani W.G has established tree nursery. Members of the community also gave land where the cut-off trenches were dug, check dams and gabions were constructed. Some members of groups also donated land where the tree nurseries were established.

### **4.5.2.3 Providing Materials**

The respondents also participated in the projects by supplying and carrying materials to the sites this included: water, ballast, sisal suckers, poly bags and plastic containers to plant tree seedlings sand, local seeds, manure, stones, jerry cans, sisal poles and ropes and 'kyondos' (baskets) and old sacks to carry some small stones, and were paid after delivery. According to one of the respondents,

*“When we were constructing the check dam if you delivered a debe of sand or stones to the construction site you were paid 25/= and this really motivated us, since the site is downhill and not many people would have done this for free, we have been working on the project for close to three years and it took so much of our time.”*

#### **4.5.2.4 Providing Working Tools**

The respondents’ also provided working tools that were used in the various interventions, they included: Jembes, spades, pangas, wheelbarrows, mattocks, Kyondos, and ropes

#### **4.5.2.5 Management of groups**

Some of the group members also participated in the management of the groups as members of the Project Management Committees (PMC). They included the group chairpersons, treasures and the group secretaries. The other key persons in group management were the group coordinators whose key role was to mobilize the local community and also the part of the community which did not directly participate in the project. The group coordinators prepared the work plans for the groups and monitored the projects progress and prepared the group progress reports in consultation with the group management committee. The coordinators were not group members and were paid a monthly allowance from the project for up keep.

#### **4.5.4 Stakeholders in the project**

The groups collaborated with various government line ministries and other NGOs in implementing the various interventions aimed at to reversing land degradation in the area. As shown on table 4.10 below

Table: 4.10: Various stakeholders who participated in the implementation of the interventions aimed at reversing land degradation in study area.

Stakeholders	Role of the stakeholder	CBOs/Groups they worked with
Ministry of Water	- Offer technical advice on building check dams, desilting dams and pumping water uphill	Kwa Nduuka W.G, Thome wa Kiima S.H.G, Wema S.H.G, Kyundu Pollen Y.G, Wasya wa Tuvilani W.G
Ministry of Agriculture	- Offer technical advice on how to construct gabions and dig cut off trenches	Kavuko S.H.G, Kyundu Hills Y.G, Ndaatai CBO, Meeko ma Kwa Nduuka, Aimi ma Kavuko F.F.S, Wasya wa Tuvilani W.G
Ministry of Livestock	- Training on bee keeping	Kyundu Pollen Y.G,
Ministry of Forestry	- capacity building on tree nursery establishment and management	Aimi Ma Kavuko F.F.S, Wasya wa Tuvilani W.G, Kwa Nduuka W.G, Kyundu Pollen Youth Group, Ndaatai CBO
Ministry of Gender and Social Services	- capacity building of the group management committee on financial and group management	All the 11 CBOs/S.H.Gs supported by GEF/SGP
GEF/SGP	- Provided funding for various interventions	All the 11 CBOs and S.H.Gs
Green Belt Movement	- Provided seeds and tree seedlings	Wasya wa Tuvilani, Meeko ma Kwa Nduuka
Local administration	-sensitize the community about the project. -project identification and implementation	Members of the community
KID	-Facilitation and coordination of the various actors	All the stakeholders.

Source: Group reports

From table 4.10 above it clearly shows that several government ministries and some NGOs partnered with the groups in carrying out the various interventions. This shows the projects received a lot support both from the government through the various line ministries and the private sector and this could ensure that the benefits that the community members will get from the project will continue to be enjoyed after the end of GEF/SGP support. For instance the training on digging of cut off trenches, management and maintenance to ensure capacity is locally available for expansion and maintenance of those dug.

#### **4.5.5 Local resources used in the projects.**

From the respondents and the FGDs, some of the local resources that were used in the project were; sand, ballast, water and land. To improve on the project, the respondents were on the opinion that experts should be hired to train communities on how to construct better gabions.

#### **4.5.6. Factors hindering members from participation**

When respondents were asked what hindered them from participating, some said that the projects were located far away from their homes, while others were of the opinion that some of the group officials were out to use them for their own selfish gain. Those formally employed said they were very busy at their places of work and could not find time to work on the project; others did not value the project.

The other major factor that hindered some people from participating in the project was low payments as there was a feeling that since the project was financed by UNDP there must be was lots of money in project and the payments (food for work) should be higher.

## 4.6 Project Benefits

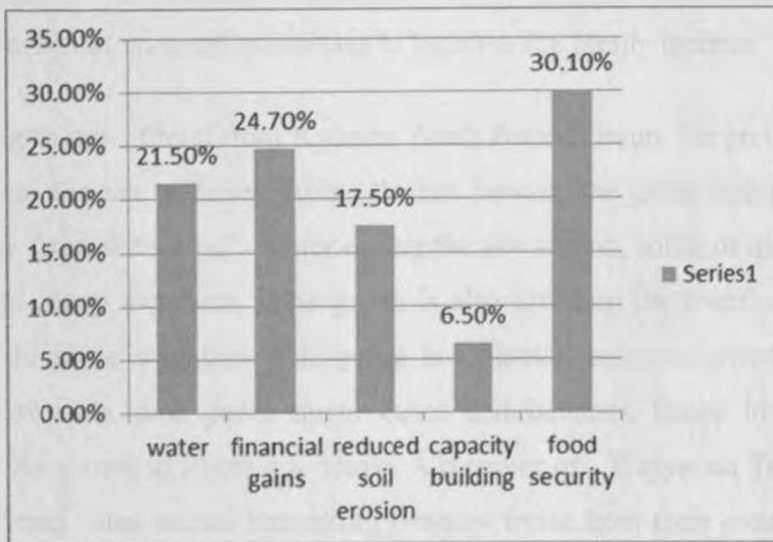
Table 4.11: Percentage of Respondents who were of the opinion that the project had met its objectives:

Number of respondents	Frequency	Percentage (%)
Yes	94	87.9
No	13	12.1
Total	107	100.0

Table 4.11 above shows that 94 (87.9 %) of the respondents think that land degradation rehabilitation projects in the area had achieved their set objectives while 13(12.1%) of the respondents were of the opinion that the projects did not meet the set objectives.

### 4.6.1 How the project has improved the lives of the community members

Fig 4.3 Benefits of the projects to the members of community



From the 4.8above 28(30.1%) of the respondents said food was a major benefit, 23(24.7%) cited financial gains, 16(17.2%) controlled soil erosion, while 6(6.5%) said it was capacity building.

#### 4.6.1.1 Food Security

Some 28(30.1%) of the respondents cited better access to food as a major benefit of the project. The horticulture activities that the groups carried out in the group farms and replicated by some of the members in their homes have improved the dietary diversity of the members. Wasya wa Tuvilani and Meeko ma Kwa Nduuka Women groups have been growing vegetables and fruits in the group farms using the water from the water kiosk and the check dam the group had constructed. Members of these groups harvest their crops once a week for their family consumption. The crops include: kales, tomatoes, paw paws and onions. The group also sells the surplus to other members of the community with the income generated being used to meet other family needs including buying food e.g. Maize and beans.

According to one group official, Meeko ma Kwa Nduuka had sold tree seedlings to the Green Belt Movement at a cost of KES 6000, the money was deposited in the group savings account as they accumulate more so that the group can start table banking, the group plans to start lending this money to its members at minimal interest so that members can start up small businesses to improve the family income.

According to one official from Kyundu Youth Pollen Group, the group had raised KES 10,400 from the sale of honey during the last harvest; the group also earns at least KES 1000 daily from the sale of water during the dry season, some of the money is shared among the group members. The group is also utilizing the overflow from the water kiosk to do some irrigation. The group has planted cassava, sweet potatoes nappier grass, arrowroots, paw paws, sugar canes and bananas, hence improving the food security. As shown in Photo 4.8 below. A member of Wasya wa Tuvilani W.G noted that the group had started harvesting pawpaw fruits from their group farm, the group sells some of the fruits and gives others to the members of the group to carry home. The group has also planted vegetables using the water from the water Kiosk and they sell to the members of the community, this was not the case before the project started.

Photo 4.8: A farm by Kyundu Pollen Y.G irrigated using the over flow water from the Water Kiosk



Water Kiosk

All those who participated (both members and non-members) in the project were rewarded financially through 'the food for work program'. Through this they earned had some income to buy food and meet other family needs. One of the beneficiaries Mama Mutuku had this to say,

*"I really thank God for this project; it is a big blessing to us. For the period that it has been here we have not slept hungry neither have we to wait for relief food as is the tradition. When we were working on the project we were paid something small to buy food and I managed to save something small which I used to buy the chicken, (photo 4.9 below) now my children can at least have an egg to eat I am sure I will have more in future that I can even sell".*

According to two key informants, 'water retained in the trenches has been used to grow tuber crops such as sweet potatoes and cassava that are drought resistant hence increasing the food varieties available to the community members. Reforestation in the

area has helped improve the vegetation cover; for instance the Ndaatai hill that was bare grass has grown on the cut off trenches and is being used as fodder.

Photo 4.9: Photo showing some chicken bought by a member of the group using the money paid as food for work



#### 4.6.1.2 Financial benefits

From the table 4.11, 23(24.7%) of the respondents said that they had benefited financially by participating in the project. The respondents participated in the project by offering labor and were compensated by being paid some money as 'food for work'. From my personal observation, the respondents were not ready to disclose how much they were paid per day as food for work.

Members of the community were also paid when they supplied the construction materials to the projects. The materials supplied included: stones, ballast, water, poly bags, sisal poles and sand among others. One respondent said that they were paid KES 25 for every *debe* of ballast they delivered to the construction site.

Through the sale of the harvests from the group's products the members of the groups had made some monetary gains. For instance from the sale of vegetables to the



community members Wasya wa Tuvilani had earned KES 7420 within 3 months. Kyundu Pollen Youth group had sold honey amounting to KES 10,400 in their last harvest; the group also sells water averaging KES 1000 daily during the dry season and at least KES 400 during the rainy season. Through the sale of seedlings to the community, Meeko ma Kwa Nduuka and Wasya wa Tuvilani women groups have earned some income.

Though not of immediate benefit some groups for example the Kavuko S.H.G, Wema and Kavuko Youth groups have the prospects of selling sand desilted from the gabions and the check dams.

#### **4.6.1.3 Water**

Some 20(21.5%) of the respondents reported that there was an increase in availability of water for domestic and livestock consumption. Time spent in search of water had also been reduced greatly. Several groups carried various activities aimed at making water more available to the members of the community they include: A check dam constructed along the Usi-Unene dry riverbed by Wema group, aided in retaining water for a longer period of time hence an increased water supply for domestic and irrigation purposes. This particular check dam is the only source of water for the people living along the river and especially so during the dry spell.

I witnessed several women and children washing clothes in the river while others bought their animals to drink water. One of the key informants had this to say,

*“This particular check dam has helped in augmenting water supply; it has also helped in recharging ground water in areas near the river. Sand and water on the check dam has made the river more reliable as a natural resource and a source of livelihood for the community. Sand has conserved the rain water underneath, this the reason we still have some water in the check dam”*

Silanga Mbuu dam which was dug during the colonial days and was filled with silt carried from the Ngongo and Kwa Kikwu gullies and partially desilted by Thome wa Kiima group still held substantial amount of water as can be seen in photo 4.10 below

The trenches and cut off trenches dug on the hill slopes have also slowed the movement of the surface runoff and reduced the amount of soil carried and deposited in the dams and more water is eventually been collected in the dams.

Photo 4.10 Silanga Mbuu Dam holding rainwater/surface runoff



From the FGD and Key informants it was reported that water from the Silanga Mbuu dam was used by a road construction company to construct part of the Nairobi-Mombasa Highway. Kwa Nduuka check dam constructed by Meeko ma Kwa Nduuka S.H.G is yet another important source of the water. (Photo 4.11) Water from this check dam apart from being used for domestic purposes is also used in Enzai shopping Centre and in the nearby Mukaa girls' secondary school.

One of the respondents had this to say;

*“The water I use in my hotel most of the time I get it from the dam down the valley constructed by Meeko ma Kwa Nduuka, it has been of great help to us and especially now that it dry. Before the dam was constructed we used to get water from Salama*

*market which 7km from here. Mukaa Girls used the water from the dam to make bricks that were used to build one of their dormitories”.*

Photo 4.11: Water containers used to carry water that has sipped down at Kwa Nduuka check dam



Check dam along the Ndunyuni gully is another very important source of water to those living nearby especially during the rainy seasons. There are reduced cases of conflict over water. One respondent Mama Wambua had this to say;

*“I was married in this place in 1987 I come from Nyeri. Before this check dam was built and some water kiosks built in this area we were really suffering, the situation was so bad. We had to go get water from the ranch across the road some 5kms from here. Since it was illegal we had to go fetch at night for the fear of being caught. I had to leave my small baby sleeping with no one to attend to her. If one was caught, the guards would take away our cans and sometimes let the dogs chase after us. I thank God that now we can fetch water with no stress thank to the project”*

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Water kiosks constructed by Kyundu pollen Youth group and Wasya wa Tuvilani groups are an important source of fresh clean water in the study area. the water is supplied by TANATHI Water Company.

Photo 4.12: Cattle drinking water from a cattle trough constructed by Kyundu Youth Pollen Group



When we visited the water kiosks we witnessed a big number of people buying water while others, brought their cattle to drink water. Photo4.12 on the above shows some cows drinking from the cattle troughs.

Water that collects on the gabions built along the Ngongo/Kikwu by Kavuko S.H.G is used by the community living nearby for domestic purposes and for livestock. Before the gabions were constructed surface runoff went into waste.

#### **4.6.1.4 Reduced Soil Erosion**

From figure 4.3, 16(17.2%) of the respondents said that there was reduction in the amount of soil eroded in the area after the interventions were put in place. This was linked to the cut off trenches that the community had dug in their farms and on the hills sides. The trenches have slowed the movement of surface runoff from the hill tops and there is less soil detachment and sediments production. As a result of reduced soil

erosion on the hills there is less soil sediments transported from the hills to the lower areas of Kavuko.

There is less loss of the fertile top soil on the hill slopes used for agricultural production. On the lower areas of Kavuko less cases of flooding have been reported according to one key informant. One of the respondents who has a farm on the lower parts of Kavuko had this to say,

*“During the rainy seasons I used to dig a trench on my farm and divert the good soil coming from the hills into my shamba since the soil is fertile I never went to buy the shop fertilizers, but for the last season there was no flooding and less soil is carried down here unlike the previous seasons ”*

Gabions constructed along the gullies have slowed the speed of water and slowed the expansion of gullies. There is growth of young vegetation in the gullies indicating that the gullies are stabilizing. The gabions hold sand that would be carried to the Silanga Mbuu dam hence there is more water in the dam water available for domestic use.

The few trees that have survived the long drought will help hold soil together and reduced the amount of soil detached by rain splash.

#### **4.6.1.5 Capacity Building**

From figure 4.3, 6(6.5%) of the respondents reported that they had learnt a lot from the various activities carried out. Members of Wasya wa Tuvilani and Meeko Ma Kwa Nduuka were trained by officials from Kenya Forest Service (KFS) on tree nursery management which includes; seed selection, nursery preparation, nursery management and transplanting. The Ministry of Agriculture officials trained some of the respondents on how to dig the cutoff trenches (the dimensions, spacing between one cut off trench to another) and how to construct the gabions along the gullies. The officers from Ministry of Livestock trained Kyundu Pollen Youth group on beekeeping with some respondents having gone ahead to replicate the same on their own farms.

From the FGDs, group management committee were trained by officials from the Ministry of Gender and Social services how to write minutes, how to keep progress reports, simple financial records and on group conflict management. The group officials were also taken through the process of opening and operating a bank account. One of the officials confessed that she had never operated bank account and when she was elected an official in one of the groups she had the opportunity of going to the bank to open the group account and today she can comfortably do the same with ease.

#### **4.6.1.6 Other Benefits**

Though project aimed to plant an approximate 1,300,000 seedlings and the actual number of trees seedlings planted were 795, 000 trees indicating a 61.2% success. The trees survival rate however was quite low because of the prolonged drought experienced in the area. It is hoped that the community will continue planting more trees in future. Increased tree density will not only assist in climate regulation and improve the quality of air we breathe, but they will provide food and shelter for the members of the community and fodder for their livestock. There will also be more cheap fuel wood and herbal medicine. Trees play a major role in erosion control, protection and conservation of water supplies and preventing floods. Because of these contributions that trees make to our environment, they are essential to our welfare.

There is ease of movement by both animals and people, the gabions and check dams are also used as earth bridges and this has reduced time spent on the travel. Members of the community who participated in the projects also formed new social networks and have been assisting one other in good and bad times.



## 4.7 Challenges Faced in implementing the interventions

Table 4.12.Challenges faced while undertaking the GEF SGP Co-financed Projects.

Challenges	Number of respondents	Frequency %
Drought	33	30.8
Financial mismanagement	31	29.0
Delay in receiving funds	25	23.4
Conflicts among the group members	9	8.4
Interference from the members of the community	7	6.5
Poor project identification	2	1.9
Total	107	100.0

From table 4.12 above,33(30.8%) of the respondents said the major challenge faced was drought,31(29.0%) said financial mismanagement in the groups,25(23.4%)delay in receiving funds,9(8.4%)conflicts among group members,7(6.5%)interferences from the members of the community and 2(1.9%)poor project identification.

### 4.7.1 Drought

According to table 4.12it indicates that 30.8% of respondents cited drought as the major challenge that they faced while undertaking the projects. The project area had been experiencing frequent rain failures since the year 2005. As a result of the prolonged drought in the area, all groups charged with the responsibility of transplanting the tree seedlings failed to do so.Wasya wa Tuvilani Women Group which was to plant trees seedlings and sell to the other groups did plant 500,000 and not 900,000 tree seedlings as indicated in the group progress report.

With the prolonged drought the group had to buy water for the seedlings. This was indeed an added cost to the group. Even after the group putting lots efforts to see that the seedlings were ready, the other groups failed to honor their commitment to buy the

seedlings. From the FGDs the groups put it clearly that they failed to purchase the seedlings because the area had not been receiving rains and they risked drying up. Wasya wa Tuvilani W.G also had a tree nursery at the Kavuko Community Conservation Centre where there was a ready source of water harvested from the roofs, from my personal observation some of the seedlings were drying up this shows that even though drought was a main challenge the group was also demoralized by the fact that they was no ready market for the seedlings. One of the group members had this to say.

*“When we were starting this project of planting seedlings it was agreed that the other nine CBOs would purchase the seedlings from us, but they did not, We had already spend on seeds, nursery attendants and also had to buy water to water the seedlings when it was too dry, when the seedlings were ready to be transferred to the farms nobody was ready to take the risk. We had nowhere to take them. As a result most of them dried up in the nurseries and the others that overgrew in the nurseries we had to cut them. This really discouraged our group”.*

From the FGDs, groups that were to plant trees on the hill sides included: Aimi ma Kavuko F.F.S, Kiumoni CBO, Kyundu Pollen Youth Group and Ndaatai CBO. Both Aimi ma Kavuko and Kyundu Pollen Youth group did not plant trees but instead opted to plant sisal which is a more drought resistance crop and its survival rates are higher. Kiumoni CBO planted 3000 seedlings in Kilungu Forest which area is cooler and wetter than the Kavuko area, as indicated in table 4.8; and Ndaatai CBO managed to plant 130,000 trees by broadcasting the seeds, though their survival rates were indeed too low. From my personal observation the Ndaatai hill is greener than the other hills as a result of the few trees that survived the long drought

As part of CBOs contribution to the project all members of the groups were to plant at least 50 trees in their individual farms (T.O.F).However from the FGDs and from the personal interviews only members from Wasya wa Tuvilani and Meeko Ma Kwa

Nduuka Women Groups planted some trees in the individual farms. It should be noted that we are all guilty of climate. According to National Environmental Management Authority (NEMA) each person should plant and care for a least one tree every year. This will absorb carbon dioxide from the atmosphere. For us to be able to realize full benefits of planting trees it should be everyone's responsibility and should not be left out to one group only (those participating in the projects). As a result of the prolonged drought respondents had to spend most of the time away from the projects looking for water and food and this meant that they would not complete their tasks on time

#### **4.7.2 Financial Mismanagement**

A number of the respondents 31(29%) cited financial mismanagement within the groups as a constraint that led the group not achieving its objectives.

Financial mismanagement was reported in some of the groups. In one group, officials were robbed of the money after withdrawing from the bank; this was linked to some members leaking information when the money was to be withdrawn as all the withdrawals were to be authorized in the group meetings. According to the one key informant misappropriation of funds and mismanagement within the groups left some of the projects either undone and/or incomplete.

From my personal observation most of the groups had some internal problems but they failed to put it across as they feared this would bring out a bad picture of the group and the project as a whole and would lead to the groups missing out on any future funding from the GEF/SGP.

#### **4.7.3 Delay in Receiving of Funds**

The third major challenge noted was the delay in receiving funds as cited by 25(23.4%) of the respondents. The delay in the first disbursement of funds from UNDP-GEF was as a result of a new requirement that phase iii GEF funding cycle would require the participating country to have developed its GEF Country Strategy. Kenya at that time

lacked a National Coordinator leading to a delay in the process of developing the strategy hence the operationization of phase iii. This delayed the disbursement by one year, instead of the projects kicking off in the year 2005 they started in the year 2006.

According to one of the key informants after the release of funds by the GEF there was a delay in release of the same at the district level. This affected the work plan greatly as the planned activities would not takeoff as planned. The activity most affected was tree planting exercise. Trees that were to be planted during the rainy season could not be planted since the seedlings were planted late and this conceded with the drought.

According to GEF regulations the funds were to be disbursed in four phases and for the group to receive a subsequent disbursement they had to submit reports for the previous project they had been undertaking. The groups were required to submit their progress reports on the various projects they were undertaking through the group coordinators to the lead NGO (KID) who would submit the same to the GEF/ SGP National Coordinator for approval. Some of the groups were slow in submitting their reports. One of the key informants had this to say,

*“The writing of the progress reports was rather too slow in some groups due to poor records, groups have had to redo their reports on several occasions, and this caused a delay in releasing funds to the other groups that had the progress reports done well and on time”*

From my own observation when I visited Kavuko Centre I witnessed some officials from one of the groups trying to reconcile their group accounts of the whole day. I was made to understand that this was not their first time they had come to the Centre to repeat the same exercise. This could be attributed to the level of education of the group members as indicated in table 4.2 which show majority of the group members had attained only primary education. From the FGDs held it was clear that some groups' officials failed to record events as they took place hence forgetting some of the

happenings and in some groups' financial mismanagement was cited and this led to delay in submitting their records on time. This meant that those groups that had submitted their reports and cleared by KID on time had to wait for those lagging behind. This eventually led to the work plan not being followed strictly which would have led to some projects not being undone or left incomplete.

Many of the respondents also complained of receiving their payment late from the groups. Once the funds had been released by the donor to the various group's accounts, the groups could not withdraw the money from the groups' account without the authorization of the Social Development Officer. This process according to some respondents caused delays in members receiving their dues.

#### **4.7.4 Group Conflicts**

A number of respondents 9(8.4%) cited mismanagement within the groups as a factor that led the groups not achieving their intended objectives. When the projects started according to information obtained from the FGDs and some key informants, some groups had leadership wrangles but with the assistance of the SDO the groups held fresh elections to replace the group officials.

According a key informant in some groups also, the group coordinators and the group management committee worked in isolation and this led to some kind of strained relationships in the group. In future the roles of each should clearly be stated and understood to avoid the repeat of the same. Cases of some group members especially the youth working while drunk were also reported hence the members could not follow instructions given by the group officials.

#### **4.7.5 Interferences from the members of the community**

As indicated in table 4.10,7(6.5%) of the respondents cited inferences from the members of the community as a major challenge in implementing the interventions, this was

mainly witnessed in groups that were to dig the cut off trenches. From the FDGs the cut off trenches were dug on individually owned land and hilltops. There were incidences where animals trampled over the trenches destroying them. Some trees planted on the hilltops had been eaten by cows and goats. According to a key informant if one was reported to the authority for having destroyed a cut off trench that person had to redo the trench afresh and if one's animals eat the trees one was to buy a pay a fine of KES 500 for a tree and KES 1000 for a fruit tree eaten.

The other challenge that the groups faced was illegal sand harvesting from the check dams and gabions. Once the sand collected in the check dams and gabions some members of the community would scoop the sand without following the laid down procedures and leave the place bare without sand to hold water. Members of the groups also complained of members of community who diverted water collected in the check dams using pipes to do irrigation in their farms. This meant that the check dams could only hold water for short time.

#### **4.7.5 Poor Project Identification**

Some 2(1.9%) of the respondents said poor project identification was a major challenge they faced while implementing the interventions. From the FDGs and information obtained from two key informants it was clear that the canal reticulation was wrongly identified since it was not environmentally feasible. According to one key informant the area identified was too sloppy, gullied, small and communally owned. In future, it important that an environmental impact assessment (EAS) be carried out before such a project is undertaken.

## CHAPTER FIVE

### 5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Summary

Kilome division in Mukaa district is a highly degraded area with huge gullies running over kilometers making many households lose their only source of livelihood (land) and also lacks water a basic commodity. To reduce land degradation, UNDP-GEF/SGP co-financed Kilome land rehabilitation cluster project at a cost of USD 300,000 in the year 2006. Ten CBOs in the division were selected to implement various interventions. This study therefore sort to take a stock of the community interventions, in restoring the degraded land. To achieve this goal both probability and non-probability sampling techniques were employed. Methods of data collection used in the study included: questionnaire, interview, focused group discussions and observations.

In total 107 respondents were interviewed comprising of 56 males and 51 females. Most of the respondents interviewed were married at 78%, with most having completed primary level of education at 58%. The main source of livelihood for the respondents is subsistence farming and sand harvesting. From the study 76.6% of the respondents were members of groups co-financed by the GEF/SGP with the majority of the members being females at 57.3%.

From the study it was established that, the groups in collaboration with the community members, government ministries and the private partners were able to implement the following activities: (i) building of check dams where a total of 5 check dams were built (ii) desilting existing dams, the study established that 5 check dams were desilted, 2 were partly desilted and 5 were undone (iii) 11 gabions were built (8 along the Ngongo/Kwa Kikwu gulley and 3 along Usi-Unene dry river bed) this was one activity

that the groups performed well as the planned number of gabions to be built were 5,(iv) 633,000 trees and 120,000 sisal plants were planted. The study established that Ndaatai CBO that choose to broadcast seeds on the cut off trenches and plant 130,000 seedlings on the Ndaatai hilltop, the hilltop was greener compared to the other hills (Kyundu and Kavuko hills)(v)digging of cutoff trenches where 21.4 km was done on farms and hillsides representing a 107%success this has greatly reduced the amount of soil carried on the low land.

The benefits accruing from participating in the land degradation rehabilitation project both at the household level and to the community include: Financial gains through the food for work program, where wages were paid to those participating in the project. Water is also readily and easily available as less time is spent searching for water as the distance one used to trek have greatly been reduced. For example water from Meeko Kwa Nduuka check dam is used by Mukaa girls and community living in Mukaa market as this is the only source of water during the dry seasons. Though the community is not fully food secure there is some improvement though on a small scale on the availability and production of food. Water from the dams is used by some groups for example Meeko ma kwa Nduuka and Wasya Tuvilani to do some small scale irrigation farming. These groups grow vegetables and fruits and have improved on their family diet.

There is also a reduction in the amount of soil eroded. The amount of soil eroded by rain water has been controlled by the cut off trenches dug on the farms and hill tops. The trenches have also helped reduce the speed of surface run-off downstream hence less soil detachment and sediments production. The decreased load from the hills has reduced the rate of gully formation and expansion. Less top soil is eroded and this implies that there are better soils which can be used for farming. On the low lands especially the Kavuko areas less cases of flooding have been reported. Gabions constructed along the gullies have slowed the speed of water and slowed the expansion of gullies. The growth of young vegetation in the gullies is a good sign the gullies are stabilizing.



By collaborating with the various government line ministries and NGOs community capacity was built on construction, management and maintenance of the various soil conservation measures in order to ensure capacity is locally available for expansion and maintenance of the same. The members of the community are also expected to integrate the soil conservation measures in their day to day activities.

From the study community members and the groups participated in the project in one or several forms which included: provision of labour, land, working materials and in the management of the groups.

The study established that the community faced the following challenges while carrying out the various interventions included: drought, delay in receiving funds, financial mismanagement, conflicts among the group members, interferences from the members of the community and poor project identification. Groups that reported financial mismanagement fared poorly in implementing the planned activities e.g. Thome Wa Kiima accomplished 28% percentage of the assigned projects compared to Meeko Ma Kwa Nduuka and Wasya Wa Tuvilani at 71% and 88% respectively which did not report cases of financial mismanagement.

Women groups were more organized and cohesive compared to youth groups and those with mixed gender. Delay in receiving funds from the donor was a major constrain in that it affected the work plans of the groups. The work plans done failed to put into consideration the time calendar of the community and there were no breaks to allow members of the community to carry out other household responsibility.

Some projects had been poorly identified for instance two check dams were not desilted because they were privately owned. Canal reticulation project which was to be undertaken by the Kavuko Youth Group could not be carried out as the area identified was not environmentally feasible

## **5.2 Conclusion**

Provision of relevant support, particularly working tools should be considered by government and/or any non-government or development support group. This is because with the limited resources of a rural household, an important activity like rehabilitating degraded land can be given less priority than it deserves. Land rehabilitation and conservation benefits are also not just limited to specific individual farms, but they affect the whole environment and so all beneficiaries should be involved in the project identification and implementation.

Good group leadership within groups and community is essential in any community-based activity. The training sessions should therefore consider training in aspects of leadership and management skills, in addition to training on land degradation. Motivations through appropriate rewards like food for work program are important because man is naturally propelled by rewards.

Conservation activities should be broadened and integrated with other pressing community needs. Observation from this study indicates that the success of the UNDP GEF/SGP land rehabilitation project was not necessarily because the community was going for land rehabilitation as such, but they were able to identify solutions for other problems e.g. they dug the cut-off trenches and desilted the existing dams as a way of harvesting water and directing it to dams for future use; some groups planted fruit trees and kept bees for food and cash supplements.

## **5.3 Recommendations**

1. There is need also to carry out an impact evaluation to systematically identify the long-term effects (positive or negative, intended or not) on individuals, households and the environment, caused by the project.

2. There is also need to encourage individual land owners to replicate the groups work by digging more cut off trenches in the farms and frequently desilt the ones dug by the groups and community so as reduce the load carried downstream from the hillsides thereby reduce the expansion of gullies and hence the amount of soil carried into the dams.

3. In future it would be important that groups undertake interventions independently rather than depend on other groups purely and if they have to collaborate then the lead NGO should closely monitor the groups.

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# APPENDICES

## APPENDIX 1

### HOUSEHOLD QUESTIONNAIRE

Questionnaire No.....

Name of the interviewer.....

Date.....

Good morning /afternoon, my name is Anne Nkirote and I am a graduate student at the University of Nairobi in the Department of Sociology. I am undertaking a study on: Kilome land degradation cluster projects for my masters' degree project paper. Kindly provide me with honest answers solely for the purpose of the study.

Thank you for creating time for this session.

#### SECTION A: BACKGROUND INFORMATION OF THE RESPONDENTS

1. Name the respondent.....

2. Sex of the respondent. (Tick where necessary)

(a) Male

(b) Female

3. Marital status. (Tick where necessary)

(a) Married

(b) divorced/separated

(c) Widow

(d) Others, Kindly specify

4. Highest level of education attained

(a) None

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#### SECTION A: BACKGROUND INFORMATION OF THE RESPONDENTS

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(a) Male

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3. Marital status. (Tick where necessary)

(a) Married

(b) divorced/separated

(c) Widow

(d) Others, Kindly specify

4. Highest level of education attained

(a) None

- (b) Primary
- (c) Secondary
- (d) Tertiary
- (e) Others, specify

5. What is your main source of livelihood?

- (a).....
- (b).....

6. What is your religion affiliation? Tick where appropriate.

- (a)Traditional
- (b)Christian
- (c) Muslim
- (d)Others

**SECTION B: MEMBERSHIP TO THE GEF/SGP CO-FINANCED PROJECT**

7. Are you a member in any of those groups undertaking GEF/SGP land rehabilitation project in this area?

- (a) Yes (go to Q8)
- (b) No

8. What is the name of the group(s)?.....

10. For how long have you been a member in the group(s) listed in 8 above?

- (a) 1-5 years
- (b) 6-9years
- (c)More than 10 years

**SECTION C: EVALUATION OF INTERVENTIONS IMPLEMENTED BY THE GROUPS**

11. List some of the activities that the groups were to carry out in regard to the GEF/SGP Co-financed land rehabilitation project.

.....  
.....  
.....  
.....  
.....

12. Did the group in 11 above meet all its set targets?

(a) Yes (go to Q17)

(b) No (go to Q18)

13. What assigned activity(s) did the group fully or partially accomplish?

.....  
.....  
.....  
.....  
.....

14. What assigned activity(s) was the group not able to accomplish?

.....  
.....  
.....  
.....  
.....

15. From your personal point of view what factors may have contributed to groups' success or failure in carrying out the assigned activities?

.....  
.....  
.....  
.....  
.....

**SECTION D: PARTICIPATION IN THE PROJECT**

16. Have you been participating in the GEF SGP Co-Financed land rehabilitation degradation project?

(a) Yes go to Q17

(b) No go to Q21

17. How often were you participating?

(a) Sometimes

(b) Always

18. Were you forced to participate or did it voluntarily?

.....

19. In what ways have you been participating? (Tick where appropriate).

(a) Providing labor

(b) Provided land

(c) Time

(d) Materials

(e) Management

(f) Others, specify

20. What local resources did you use in the project?

.....  
.....  
.....  
.....

21. What are some of the reasons that may have hindered you from participating in the projects?.....

.....  
.....

.....  
.....

**SECTION E: PROJECT BENEFITS**

22. How has the GEF SGP project in particular improved your life at household level? Rank in order of importance (before the project was started and now)

- (a) Food security
- (b) Water
- (c) Knowledge gained
- (d) Formed new networks (friends)
- (e) Travelled to new places
- (f) Financial Gains

23. How has the larger community benefited? Kindly give examples.

.....  
.....  
.....  
.....  
.....  
.....

24. Do anticipate getting more benefits in the near future from the project?

- (a) Yes (go to Q23)
- (b) No

23. Kindly list these benefits.

.....  
.....  
.....  
.....

**SECTION F: FACED WHEN UNDERTAKING THE PROJECT**

24. Highlight some of the challenges if any you faced when undertaking the project. Start with the most, significant.

- (a) Mismanagement
- (b) Conflicts among members
- (c) Delay in receiving Funds
- (d) Drought
- (e) Interferences from the community (illegal sand harvesting, grazing)
- (f) Fear of losing the project to the Government
- (g) Others, specify

25. What did you like and/ or not like about the GEF SGP project.

.....  
.....  
.....  
.....  
.....

26. What could been done to enhance the projects' benefits even further

.....  
.....  
.....  
.....  
.....

Thank you very much once again for the information you provided. I assure you this information will be treated with total confidence.



## APPENDIX 2

### KEY INFORMANT GUIDE

Key informant Guide No.....

1. How can you describe the performance of the UNDP GEF SGP Kilome Co-financed land degradation rehabilitation project from inception to date?
2. How were the members of the various groups and members of the community involved in the rehabilitation project?
3. Apart from the community members who else came in to assisted the various groups in undertaking the project?
4. What activities were the groups assigned to undertake?
5. What are some of the activities not done or done partially by the groups? Why the success or failure in some groups?
6. Are they visible benefits to the households and the community at large? Please share some specific examples? (Probe on food security, access to water, and reduction on rate of soil erosion)
7. From your perspective, what challenges or concerns were encountered with this project? Kindly share your views.
8. How has land degradation in this area affected food productivity and access to water?
9. Is there anything that could have been done differently to achieve more results?