ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

COLLEGE OF DEVELOPMENT STUDIES

The Socio-Economic and Institutional Dynamics of Integrated Watershed Management: The Case of Kanat and Magera Micro-watersheds, Amhara National Regional State

A thesis submitted to the School of Graduate Studies of Addis Ababa University in partial fulfillment of the requirements for the Degree of Master of Arts in Development Studies (Rural Livelihoods and Development) in College of Development Studies

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DEVELOPMENT STUDIES

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TABLE OF CONTENTS

Contents **Page**

List of Tables

List of Figures

List of Boxes

Box ..... Page

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List of Acronyms

ANRS	Amhara National Regional State
ARDO	Agriculture and Rural Development Office
BoA	Bureau of Agriculture
BoARD	Bureau of Agriculture and Rural Development
CDS	College of Development Studies
CPRs	Common Pool Resources
DAs	Development Agents
DTTOA	Debre Tabor Town Office of Agriculture
EHRS	Ethiopian Highlands Reclamation Study
EPLAUA	Environment Protection and Land Administration and Use Authority
ETB	Ethiopian Birr
FAO	Food and Agriculture Organization of the United Nations
FDRE	Federal Democratic Republic of Ethiopia
FGDs	Focus Group Discussions
FWAO	Farta Woreda Administration Office
FWARDO	Farta Woreda Agriculture and Rural Development Office
FWLUPO	Farta Woreda Land Use and Planning Office
GDP	Gross Domestic Product
GLCO	Gote-Level Watershed Coordinators
GTZ	The German Technical Cooperation
IFAD	International Fund for Agricultural Development
IFSP-SG	Integrated Food Security Program-South Gondar
IWMI	International Water Management Institute
IWSM	Integrated Watershed Management
KA	Kebele Administration
LLPPA	Local Level Participatory Planning Approach
masl	Meters above sea level
MERET	Managing Environmental Resources to Enable Transition to more Sustainable Livelihoods

NGOs	Non-Governmental Organizations
SGAZ	South Gondar Administrative Zone
SLM	Sustainable Land Management
SPSS	Statistical Package for Social Scientists
WFP	World Food Program

Abstract

A host of socio-economic, institutional, environmental and cultural factors are responsible for either the success or failure of a particular watershed management program. In spite of the growing interest in the literature on watershed management, there is limited attention given to the socio-economic and institutional dynamics behind the success or failure of watershed management interventions. The aim of this study is, therefore to explore this new frontier of research in watershed management by taking two contrasting micro-watersheds, Kanat and Magera, in the Blue Nile Basin. To this end, such issues as the major stakeholders involved in the watershed intervention and their respective roles; the differences in institutional arrangements and stakeholders' participation; and the root causes of success and failure of the watershed intervention in the study sites were scrutinized. The study involved both quantitative and qualitative data collection methods including, household survey, focus group discussions, key informant interviews, personal observation, and review of some secondary data.

A mix of Agrawal's synthesis of 'Facilitating conditions' for effective governance of Common Pool Resources (CPRs) and determinants of a successful watershed management identified by different scholars are used as an analytical framework for this study.

The results of the study have shown that there are clear differences between the two integrated watershed interventions in: level of participation of the beneficiaries in the program; evolution and strength of local institutions to manage the resource and the appropriation of benefits; and the level of commitment of the donor and government bodies. Accordingly, a synergy of active roles of the Kebele administration, high commitment and participation of the beneficiaries, strong commitment of a donor agency i.e. GTZ, good leadership and coordinating skill of the watershed management committee, and the active role of government bodies in creating enabling environment were the most important factors that contributed to the success of the watershed intervention in Kanat. On the other hand, weakness of Kebele Administration, lack of follow-up by the concerned government bodies, lack of strong local institutions including by-laws, and GTZ's failure to consult the community before the intervention were the most important reasons behind the failure of the watershed intervention in Magera watershed.

These results have important implications for the design of successful integrated watershed management programs. Establishment of appropriate management arrangement should be given equal emphasis to that of implementation of the program. All important actors and their respective role should be clearly identified prior to any integrated watershed intervention. Clear chain of linkage/co-operation should be established among and within the upper level institutions and the local level actors. Since community's participation highly depends on the level of awareness, awareness raising should be in the center of any integrated watershed management program. Presence of clearly defined boundaries of the resource and the resource users per se based on the

common consensus of the beneficiaries and presence of committed local leadership are important conditions for success of integrated watershed management.

Implementers should not rush to inject a package of intervention ideas into the target community and force the beneficiaries to follow them strictly. But other mechanisms such as demonstration and experience sharing visits can be used. Appropriate incentive mechanisms should be developed as part of the watershed management program to foster beneficiaries' participation. The livelihood concerns of the community and their priorities should be identified and incorporated as an integral part of integrated watershed management program.

CHAPTER ONE
INTRODUCTION

1.1. Background

The twenty-first century is a time by which the world is getting seriously confronted by issues of sustainable use of water and land resources. Despite the emerging recognition of their decisiveness for the survival of humanity on the planet, these days, water and land ecosystems are being degraded at an alarming rate (Hannam, 2003). The case is worse in developing regions, where the majority of the population depends on these resources for its livelihoods. Hence, the conservation and management of land and water resources for sustainable intensification of agriculture and poverty reduction in developing regions has remained one of the most challenging policy issues for a long time (Bekele et al., 2007). The three inherently interrelated and interdependent land resources, namely, soil, water, and vegetation are in the immediate focus of most local, regional, and international policies, programs, initiatives, covenants, protocols, and conferences that are meant to pave the way to sustainable development.

Generally, natural resources degradation is a major environmental, socio-economic and policy challenge in Ethiopia (Aklilu, 2001). In particular, land degradation in the form of soil erosion and nutrient depletion has put a perilous stress on rain-fed agriculture on which the country's economy and the livelihoods of its people largely depend (Aklilu, 2001). The combined effect of low productivity and ecosystem degradation therefore, has locked the poor in a vicious circle of poverty and environmental degradation (Holden et al., 2005).

Some of the major causes of land degradation in Ethiopia are known to be the symptoms of improper management of natural resources (FDRE, 2003). The proximate causes of land degradation in Ethiopian highlands include production on steep slopes and fragile soils with inadequate investments in soil conservation or vegetation cover, erratic and erosive rainfall patterns, declining use of fallow and limited recycling of dung and crop residues to the soil, limited application of external sources of plant nutrients, deforestation, and overgrazing (Fitsum et al., 2002; Lakew et al., 2000). In addition to these immediate

factors, the underlying factors of land degradation include population pressure, poverty, high cost and limited access to agricultural inputs and credit, low profitability of agricultural production, high risk facing farmers, fragmented land holdings, and insecure land tenure among others (Ibid). The end-result of all these is an accelerated soil loss, amounting to over 1.5 million tones per year and immediate ecological degradation (FDRE, 2003). In line with this, several studies (Atesmachew and Taye, 2006; Ayenew, 2005; Gete, 2006; Pender et al., 2001) revealed that the major causes of environmental degradation in Ethiopia are believed to be the high growth of human and livestock population, low agricultural productivity, and dependence on fuelwood.

The Ethiopian highlands represent the most degraded areas in Africa if not in the world (Terefe, 2003). As to the magnitude of the severity of erosion, 50% of the highlands are significantly eroded while 25% is seriously eroded (Alemneh, 2003). As part of Ethiopian highlands, the Amhara National Regional State (ANRS) accounts for more than 50% of the estimated annual soil loss in Ethiopia with the land estimated to be eroding at very rapid rates of 16-50tones/hectar per year (Lakew et al, 2000).

In response to heavy land degradation in the country, large scale efforts for the purpose of implementing natural resources conservation and development programs had taken place in some selected catchments starting from early 1970s. The programs mainly focused on soil and water conservation and rehabilitation of degraded lands through building physical structures and afforestation measures (Aklilu, 2001; Alemneh, 2003; Alemayehu, 2006; Woldamlak, 2003). However, it is widely recognized that the projects had little success in meeting their objectives due to several socio-economic, environmental, and technical problems *inter alia* (Aklilu, 2001; Woldamlak, 2003; Alemneh, 2003).

After seriously observing that the soil and water conservation measures had little succeeded as compared to the envisaged outcomes, watershed approach was adopted by the country in the 1980s. However, most of these watershed management programs were not also successful except some few impressive achievements observed like in MERET project as scrutinized by Gete (2005). According to Gete (2005), over the long years of project

implementation, the MERET[1] project has better succeeded in use of Local Level Participatory Planning Approach (LLPPA); undertaking focused and efficient capacity building at all levels; taking long-term commitment; and flexibility and continuous learning to accommodate new thinking and needs of beneficiary communities. Moreover, the project is known to provide interesting lessons with respect to linking conservation with improving land productivity and household income, use of participatory monitoring and evaluation system, and gender considerations (Ibid).

Since a host of socio-economic, institutional, environmental, and cultural factors are responsible for either the success or failure of a particular watershed management program, the whole issue is to understand the whole gamut of factors affecting it. Institutions are one of the key determinants of a successful watershed intervention. It is against the above-stated background that, therefore, this study focused on drawing lessons from one successful and one failed stories of watershed intervention. The study specifically was devoted to determine the socio-economic and institutional dynamics of integrated watershed management (IWSM) by taking two micro-watersheds in the Blue Nile (Abay) River basin, namely Kanat and Magera.

1.2 Statement of the Problem

Several studies revealed that large-scale efforts on natural resources conservation and development programs, which have taken place in selected catchments in Ethiopia starting from early 1970s, were not as successful as expected to be (Aklilu, 2001; Alemneh, 2003; Alemayehu, 2006; Woldamlak, 2003). Among the very reasons behind the failure were: the top down nature of the conservation approach itself, improper planning, inadequate resource allocation, recurrent drought, costliness of the structural conservation measures, labor intensive nature of the technologies, little short-term returns/benefits gained from the programs, little systematic efforts made to incorporate indigenous conservation practices, and political constraints (Ibid). On top of all these, the less emphasis given to the integrated

[1]A land rehabilitation project which has been implemented in Ethiopia, especially in the highlands since 1980 by the Ministry of Agriculture in collaboration with the WFP. The project has passed several steps since 1980 until it acquires a new name 'MERET' in 2003.

watershed management is said to be another responsible factor for the failure (Woldamlak, 2003)

The magnitude of resource degradation and the inability of the fragmented approach to counter it remained two key challenges reinforcing each other. This, therefore, called for approaches that ensure sustainable land management. As a way out, IWSM approach was introduced and has been practiced widely. According to Alemayehu (2006), watershed management approach started about a decade later than the fragmented soil and water conservation program that started in 1970s in Ethiopia. However, one can easily understand from a mere observation that degradation of natural resources is a major problem along with the concomitant and co-evolving severe famine, low agricultural productivity, wide-spread poverty and recurrent drought in the country. More specifically, resource degradation is a critical environmental problem in highland Ethiopia (Terefe, 2003; Woldamlak, 2003).

As to some crucial recommendations for effective watershed management, Woldamlak (2003) noted that given the diversity in the physical and socio-economic environments and the spatial variations in the type and severity of resource degradation in Ethiopia, any effort at conservation needs to be site-specific. Moreover, he added that the diverse environmental conditions in the country demand site-specific conservation planning, which requires site-specific investigations into the problem. Designing realistic and acceptable conservation techniques and identifying promising approaches for intervention requires a rigorous understanding of the process, extent and rate of resource degradation and the socioeconomic and institutional circumstances at the local-level (Ibid). In the integrated approach, community needs and problems should also be taken as part of a holistic watershed management scheme (Tennyson, 2005).

One of the crucial issues that need to be given emphasis in IWSM and in the management of Common-Pool Resources (CPRs) is the institutional set-up. Adger (2003) pointed out that articulation of appropriate institutions for the governance of natural resources is essential for the realization of sustainability. Bandaragoda (2000) made a remark that

understanding the existing institutions, how they affect performance, and factors affecting the institutions themselves is important to identify and assess the need for institutional change for effective watershed management. This also helps in replicating best practices and in sharing experiences for effective development of resources in watershed interventions.

So far, different scholars have been interested in the various aspects of watershed management in Ethiopia. Many of them have looked into the need for and workability of watershed management (Alemayehu, 2006; Ayenew, 2005; Belay, 2003; Woldamlak, 2003). However, given the wide spatial and temporal dynamics of watershed management, a long way remains to fill a gap in empirical work in socio-economic and institutional dynamics of IWSM.

In an attempt to contribute to fill the above-stated gap by drawing lessons from one successful and another failed case of watershed management, the study, therefore focused on assessing the socio-economic and institutional dynamics of integrated watershed management in Kanat and Magera micro-watersheds of the Blue Nile river basin. To this end, the study assessed such issues as the major stakeholders involved in the watershed intervention and their respective role, the institutional arrangements and the differences in institutional arrangements, and the major reasons behind success and failure of IWSM in the study sites.

1.3. Objectives of the Study

The general objective of this study is to examine the socio-economic and institutional dynamics of IWSM in the selected study sites with the following specific objectives:

- To identify the major stakeholders involved in IWSM in the study sites and their respective roles
- To explore the differences in institutional arrangements and stakeholders' participation between the two IWSM interventions.

- To identify the root causes of success/failure of the respective IWSM interventions in the study sites.
- To draw some policy implications for a successful IWSM interventions.

1.4. Significance of the Study

It is believed that the policy implications drawn by the study will have some contribution towards paving the way to appropriate policy for a successful integrated watershed management. It is also believed that the findings of the study will inform development practitioners to include some important socio-economic and institutional considerations in their quest for sustainable integrated watershed management. In addition, it is the researcher's conviction that the study output will motivate other researchers to take part in related applied investigations so that they, in their part, will contribute to the nation wide move against the self perpetuating and reinforcing threats to humanity viz. poverty and natural resources degradation.

1.5. Scope and Limitations of the Study

Attempts were made to look into the socio-economic and institutional dynamics of integrated watershed management at micro-watershed level. Focusing on some socio-economic and institutional issues pertinent to the whole process of implementation and establishment of the management arrangement, efforts were made to identify some important factors that determine success and failure of an IWSM.

Though the researcher has got some ground to draw valuable lessons and conclusions about the reasons behind the success and failure of the IWSM interventions from the study, he is also convinced that there would be more and more reasons behind success and failure of an IWSM intervention based on the different socio-economic and bio-physical contexts of the study sites. In addition, it is true that the size of a watershed (and also that of CPRs) is one of the important factors that need to be considered in any watershed planning. This case study provides some lessons both for the micro and macro-watershed level interventions.

But it should also be noted that most of the important factors that determine success and failure of IWSM intervention at macro-watershed level could be out of the reach of this study. One more important point is also that it is beyond the scope of this study to identify and expose the exhaustive list of the benefits accrued (both communal and personal) from both watershed interventions in precise economic measures.

1.6. Organization of the Thesis

This study is structured into seven chapters. Following the introductory part in chapter one, chapter two presents review of related literature. The conceptual and theoretical underpinnings, empirical literature, and the analytical framework make up the three broad subdivisions of the chapter. The empirical literature subdivision is further broken into five sub-sections: Ethiopian highlands: a general overview; large scale conservation efforts of the 1970s and 80s in Ethiopia: why less successful?; genesis and evolution of watershed management; the role of traditional institutions on natural resource management in Ethiopia; determinants of watershed management; and the 'commons'. In the analytical framework, two issues namely, factors that determine success/failure of watershed management and facilitating conditions for effective governance of CPRs are discussed.

Chapter three presents the methodology followed in the whole process of this research project. It is subdivided in to five sections, namely, selection of the study sites, sampling procedure, data sources, methods of data collection, and methods of data analysis. The fourth chapter is devoted to description of the study area and characteristics of sample households. To this end, four major themes, namely geography and climate, major livelihood activities, access to farmland and livestock, and constraints to agricultural production are briefly discussed. Chapter five constitutes two major sub-sections, namely land degradation and the whole process of implementation of the IWSM in the study sites. Some light was shed on the types and causes of land degradation and local responses to it. Regarding the implementation of the IWSM, some major themes,as, the rationale behind the program, the planning process, the major activities undertaken, major stakeholders involved, challenges faced and the ways out, and benefits accrued from the program are

discussed. Focusing on the establishment of the watershed management program, the sixth chapter provides some facts on the institutional arrangements and the very reasons behind success and failure of the program. The final chapter presents the major conclusions and policy implications.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

2.1. Theoretical and Conceptual Underpinnings

2.1.1. Definition of Concepts

A) Land Degradation

Land degradation is reduction in capacity of the soil or vegetation to support life, through the damage to physical, chemical or biological properties, contributing to an unsustainable ecological system (www.nwpg.gov retrieved on *April 25, 2009*). In other words, it is the decline in the overall quality of soil, water or vegetation condition commonly caused by human activities (www.en.wiktionary.org retrieved on *April 25, 2009*). It could be a human induced or natural process, which negatively affects the land to function effectively within an ecosystem, by accepting, storing and recycling water, energy, and nutrients (www.grid.unep.ch retrieved on *April 25, 2009*)

B) Watershed, Watershed Management and Integrated Watershed Management (IWSM)

A watershed is an entire area drained by a natural stream or artificial drain in such a way that all the stream flow originating in the area is discharged through a single outlet. It constitutes all the natural resources in a basin, especially water, soil, and vegetative factors (Alemayehu, 2006). Therefore, in general it is the entirety (or a complete representation) of the area including all the bio-physical and the socio-economic entities where water is an integrative component with a defined common outlet.

These days, it is recognized that management and conservation of land resources through physical structures, reforestation, and other conservation measures would not be sustainable and replicable unless people's concerns are taken in to account. Watershed management is increasingly seen as an appropriate vehicle not only for environmental conservation but also for improvement of rural livelihoods (Achouri, 2005; FAO, 2002)

The IWSM of the late 1980s was the forerunner of sustainable rural development as advocated at the 1992 Rio Summit. Both approaches share a systemic view of bio-physical and social interactions, a concern for on- and off-site and the short-and long-term effects of change, and a fundamental belief - 'appropriate social management can optimize the functioning of human ecosystems'. Both aim at generating benefits for people and environments. This shared paradigm suggests that it is difficult to distinguish between IWSM and sustainable development in watershed areas (FAO, 2006). The integrated concept has expanded to include community needs and problems as part of a holistic watershed management scheme (Tennyson, 2005).

C) Institutions

Institutions are defined in many different ways. The most widely quoted one is by Douglas North (1990) which, defines institutions as humanly devised constraints, made up of formal constraints (i.e. rules, laws, and constitutions), informal constraints (i.e. norms of behavior, conventions, and self-imposed codes of conduct) that structure human interactions, and their enforcement characteristics (Bekele et al., 2007). Putting it in similar way, several scholars, noted that institutions can be either formal (written rules, constitutions, laws, and contracts), or informal (customs, sanctions, taboos, traditions, and unwritten codes of conduct) rules that regulate access to resources (Wolde-Sellasie, 2001; Bandaragoda, 2000; Heikkila, 2004). They set the ground rules for resource use and establish the incentives, information, and compulsions that guide economic outcomes (Bandaragoda, 2000). The institutional environment is dynamic and changing; and institutions operate at all levels from the household to the international arena and in all spheres from the most private to the most public (Matsaert, 2002).

D) Property Rights

Property rights are rights that govern the use and ownership of a resource, such as with the use and ownership of land. "A right" is the capacity to call up on the collective to stand behind one's claim to a benefit stream" (Bromley, 1991 as cited by Yeraswork, 2000).

According to Irwin (2001), there are four different kinds of property systems according to who has the right to the resources:

I. **Open access:** Each potential user has a complete autonomy to use the resources, since no-one has the ability to keep any potential user out. Everybody and nobody has a claim. The resources are owned by no one and they belong to every one, with no defined property rights governing access and use of resources.

II. Private Property: Owned and used by one individual who decides who can and cannot use the resource and how. Secure claim rests with an individual.

III. **State Property**: National government is formal authority on the management of the property through central regulatory policies and legal framework. Secure claim rests with the government.

IV. **Common Property Resources**: Occur when use rights for a resource are controlled by an identifiable group and there exists rules defining who may use the resources and how and who may not use the resource. Individuals have claims on collective goods as members of a recognized group

E) Land Tenure

Land tenure is the relationship, whether legally or customarily defined between people, as individuals or groups, with respect to land (FAO, 2002 as cited by Hodgson, 2004). Explaining the critical importance of land tenure in relation to the management of land and land-based resources, Yeraswork (2000) put it as follows:

> *...Land tenure is also critical for the emergence of viable local level collective land management structures. A land tenure system, which clearly defines enforceable rights empowers land-users. As an institution, land tenure not only governs access to and control over land and land based resources and the flow of the benefits thereof, but also it is a source of expectations, a basis for actors to simulate and predict one another's behavior in the sphere of activity to which the regime applies. Thus the fundamental nature of the role it plays in society can hardly be overstated.*

F) Common Pool Resources (CPRs)

Common-Pool-Resources (CPRs) are resources that are communally owned and used by multiple users and for which there exists communal arrangement for the exclusion of non-owners, as well as for the allocation of co-owners (Berkes, 2002; Ostrom, 1990). CPRs exhibit varying degrees of two key characteristics: difficulty in excluding users and subtractability of supplies, where each resource user reduces the supply available to others (Matsaret, 2002).

Property Rights School (PRS) writers argue that common ownership of land is judged to be incapable of allocating costs and rewards in such a manner as to make a person endowed with common rights incur the costs of, or reap the benefits from his economic actions (Yeraswork, 2000). The core problem with open access and unregulated CPRs is that they do not give individuals the proper incentives to act in a socially efficient way (Baland and Platteau, 1996). Moreover, it's unlikely that collective owners of a CPR could reach agreement that would lead to the best long-term use of the land (Yeraswork, 2000). In other words, such property systems are likely to generate externalities. The proponents of PRS, hence, argue that private property is the most appropriate way to make the individuals to internalize the externalities. If every piece of land is owned by someone, in the sense that there is always an individual who can exclude all others from access to any given area, then individuals will endeavour by cultivation or other improvements to maximize the value of the land (Posner, 1977 as cited by Baland and Platteau, 1996). The counter argument came from several scholars who could show through their vast empirical work that there are evidences that societies are able to manage CPRs for the better of the resources and the wellbeing of the resource users themselves (see sub-section 2.2.6).

2.2. Empirical Literature

2.2.1. Ethiopian Highlands: A General Overview

The highlands of Ethiopia (areas of over 1500 masl), which make up about 45% of the total land area, support over 85% of human population and two-thirds of animal population.

They are also the sources of many of the country's major resources (including the Blue Nile river) (Ayenew, 2005; Alemneh, 2003).

Different studies have revealed that there is a wide spread belief that the Ethiopian highlands used to have an adequate fauna and flora, dependable soils, and climatic conditions conducive to attain high levels of agricultural production. In the course of time, however, the highlands have become the most degraded areas in Africa if not in the world (Terefe, 2003). Markos (1997) also underlined that the areas of rain-fed agriculture most under pressure from ecological degradation in the Horn of Africa lie in the northern and central highlands of Ethiopia. As to the magnitude of the severity of erosion, 50% of the highlands are significantly eroded while 25% is seriously eroded (Alemneh, 2003).

2.2.2. Large Scale Conservation Efforts of the 1970s and 80s in Ethiopia: Why Less Successful?

Large scale efforts for the purpose of implementing natural resources conservation and development programs had taken place in some selected catchments starting from early 1970s. The programs mainly focused on soil and water conservation and of rehabilitation of degraded land through building physical structures and afforestation measures (Aklilu, 2001; Alemneh, 2003; Alemayehu, 2006; Woldamlak, 2003).

However it is widely recognized that the projects had little success in meeting their objectives; and land degradation has continued to be the most serious environmental problem especially in highland Ethiopia. Among others the top-down nature of conservation approaches in the development and transfer of technologies considerably contributed to the ineffectiveness of the strategies and the failure of the projects (Aklilu, 2001; Woldamlak, 2003; Alemneh, 2003). Moreover, various socio-economic, cultural, and political constraints; improper planning; inadequate resource allocation; and recurrent drought were also known to dilute much of the efforts (Alemayehu, 2006; Woldamlak, 2003). On top of that, the less emphasis given to the IWSM is also another factor responsible for the failure (Woldamlak, 2003). Alemneh (2003), in his part, identified the

following four major shortcomings of these large-scale soil conservation efforts of the 1970s and 80s irrespective of some important ecological benefits drawn from the projects:

> *First, these structural conservation measures were found to be costly. Second, farmers were reluctant to adopt such labor-intensive measures (without getting tangible benefits in terms of food and income). Third, there was little systematic effort made to incorporate indigenous soil and water conservation techniques and not to consider the loss of farm land for conservation. Finally there was no obvious relationship between these large investments on land rehabilitation on one hand and improvement in the food security and income of farmers on the other.*

2.2.3. Genesis and Evolution of Watershed Management

Rural development over the past 20 years has been marked by a gradual shift from the intervention-based methods to approaches promoting rural people's involvement in their own development (Bonnal, 2005). Modern watershed management was born during the 20th century as a technical practice, largely based on major hydraulic engineering and forestry interventions. However, experience has shown that technical measures alone are not enough to address watershed problems (FAO, 2007). These days, world-wide environmental, socio-economic and political changes are challenging some of the foundations on which watershed management has been based for the last 20 years. Therefore watershed management is going through a period of experimentation in which "old" and "new" practices co-exist and mix. (FAO, 2006).

Watershed management has evolved and passed through several development stages. In the initial stage it was a subject of forest and forestry-related hydrology (FAO, 2006). This was purely natural resources management approach (essentially top-down) and emphasis was put on the management of land and soil, water resources conservation, and afforestation (Faures, 2005). The involvement of people was not an issue during this stage. During the second stage, it became land resources management related issue, including activities with an eye on economic benefit (FAO, 2006). At this stage the focus was on beneficiaries. It is now "participatory and integrated" watershed management with involvement and contribution from the local people (FAO, 2006). In the current and final stage, participation is at the center of the planning and development process (Faures, 2005; Tennyson, 2005).

These days it is generally accepted that sustainable use and management of land resources will only be achieved by adopting a system of improved land, water, and vegetation management and use based on an integrated approach to land resources development with the direct involvement and participation of the different actors (Achouri, 2005). Moreover in the integrated approach, community needs and problems are taken as part of a holistic watershed management scheme (Tennyson, 2005).

2.2.4. The Role of Traditional Institutions on Natural Resources Management in Ethiopia

It is obvious that, Ethiopian rural society is endowed with a variety of important traditional institutions that have different purposes, functions, and memberships (Yigremew, 1999); and that can be strengthened and transformed to assume various development roles (Alemneh, 2003). Paradoxically, lack of strong grass roots/community organizations is one of the major constraints to operationalizing and translating policies enunciated at the federal level in to action at local level and community levels particularly in the areas of natural resources management. In the past, even when local institutions existed, they were used to enforce unpopular government conservation measures such as community forestry, hillside closure, and labor demanding conservation measures (Ibid).

Recently there has been a strong revival of traditional and indigenous institutions to assume a self-help and development role in rural Ethiopia. Realizing the potential of these community based organizations/institutions such as *Idir*[2], these days, several NGOs have used these organizations for various development activities including agricultural input supply, saving and credit, natural resources conservation, and health care (Bekalu, 1997 as cited by Yigremew, 1999; Alemneh, 2003). Alemneh, (2003)recommended that government should make a concerted effort to support and strengthen indigenous community organizations as they have the potential to be an important vehicle for

[2]*Idir is a voluntary association, which is usually organized on a neighborhood or locality basis for the purpose of mutual support on the events of death in any of the members' households (Yeraswork, 2000). It also serves several other social roles.*

facilitating community based approaches in natural resource management and self-help development activities

2.2.5. Determinants of Success in Watershed Management

Successful watershed management is a function of a range several factors. Watershed management activities are undertaken in a local, state/regional, and national policy context where there is always in place a framework of laws, regulations, institutional mechanisms, cultural and social mores, and market systems that govern and guide the activities (Brooks et al., 2003). Effectiveness and capacity by which a society manages its watershed resources is, therefore, mediated by different factors, namely, natural factors (e.g. climate, soil conditions, landform, drought, famine, etc.); economic, technical, and administrative capacity; social governance capacity; and the legal framework (Contreras, 2004; Brooks et al., 2003). Hence, any IWSM program should consider the whole range of these bio-physical, institutional, and socio-economic elements, which are inter-related and interact among themselves to determine the sustainability and productivity of the agro-ecosystems (Alemayehu, 2006).

Do Policy and Other Formal Institutions matter?

Appropriate policy environment is the pre-requisite for being able to implement watershed management processes that satisfy the objectives specified by the interested parties (Brooks et al., 2003). Watershed governance is unlikely to succeed if a supportive policy environment is lacking (FAO, 2007). The national economic policies play a great role in fashioning the institutional framework for any given social context. Institutional mechanisms like markets and non-market incentives and public investment in research, education, and extension have significant impact on water and land management practices (Quinn et al., 1995 as cited by Brooks et al., 2003; Pender et al., 2001). Access to rural financial services also plays a key role in rural development initiatives (Yohannes and Middlebrook, 2001). The highly contested reality, the land tenure issue, also may have a power of either constraining or promoting peoples' participation in watershed management.

Is There a Need to Consider Livelihood Concerns?

Livelihoods should be the most important concerns of watershed management programs (see Fig. 2.1). Owing to the pivotal role of human population in watershed health and balance, local livelihoods are major issues in sustainable watershed management (FAO, 2007). Therefore, priorities and needs of the targeted beneficiaries should be carefully examined before one opts for implementation of a certain watershed management program. In his study devoted to review *experiences of selected NGOs in natural resources management in Ethiopia,* Ginjo (2001), suggested that NGOs should not only seek for technical/biological solutions to natural resources degradation, but they should also be able to address the issues of other life-supporting systems to be made available for the rural poor. It is fair to say that technologies focused narrowly on arresting soil erosion without fully considering the underlying causes of low soil productivity, socio-economic factors, and the need for tangible benefits will not be attractive to poor farmers (Alemneh, 2003).

What portfolio of actors Plays Role in the Watershed Intervention?

Experience has shown that empowerment of the main stakeholders in watershed management projects/programs to plan and implement appropriate activities is essential if a project/program is to have any chance of sustainability (Tennyson, 2005). The decisions of a wide range of governmental and non-governmental actors that are involved in watershed management influence the health and integrity of ecological systems (Imperial and Hennessey, 2000 as cited in Genskow and Born, 2006). The important stakeholders in watershed management could be government development agencies, local government and line agencies, research institutes, agricultural/environmental education institutes, farmers, landholders, regulatory agencies, donors and NGOs (Gete, 2006; FAO, 2007). The way these interact with each other and the level and extent of participation in management of natural resources in the watershed have an implication on the success/failure of a watershed management program. The challenge for a watershed governance program is, therefore, to get this portfolio of actors work together more effectively (Genskow and Born, 2006).

The Whole Approach Matters?

The top-down approach in natural resources management, which was prevalent during the 1970s and 1980s, has been replaced by the grass roots bottom-up approaches. However, it appears that neither of the extremes is a recipe for success (Tennyson, 2005). The correct sustainable approach is somewhere in between. The proper mix would include factors such as bio-physical, social, cultural, financial, and political considerations for all concerned stakeholders (Ibid). IWSM planning should involve and enable all stakeholders within a watershed to identify local natural resource issues and then to develop and implement watershed plans that promote environmentally, socially, and economically sustainable development (FAO, 2006).

Watershed ecology is primarily a human ecology. So a thorough understanding of watershed stakeholders' views, logic, and knowledge is necessary (FAO, 2006). Moreover, farmers' decision to conserve natural resources in general and soil and water resources in particular is largely determined by their knowledge of the problems and perceived benefits of conservation (Aklilu, 2001. Awareness rasing among the beneficiaries, therefore, is crucial. Besides this, integrating the "modern" natural resources management technologies with indigenous ones in most cases is witnessed to improve the chance of adoption of technologies (Ginjo, 2001).

Why did Many Watershed Programs Fail?

Putting the major reasons behind failure of most of the watershed management programs in Africa, Achouri, (2005) argued as follows:

> *Many watershed management programs have failed to achieve their objectives mainly owing to the following reasons: focused too much on natural resources conservation; they were designed in little attention to human activities and priorities and needs of people; they neglected the beneficiaries' involvement and contribution to the planning and implementation of watershed management intervention; they were frequently limited in span and scope and lacked the long-term commitment needed to address underlying causes and long term management issues in satisfactory ways.*

It is understood from this argument that inappropriate approach, failure to consider the livelihood concerns of the beneficiaries, and failure to identify and involve the relevant stakeholders are the major reasons behind the failure of most of the watershed management programs in the past.

2.2.6. The 'Commons'

Scientific interest in the commons grew throughout the 1970s and early 1980s largely in reaction to Hardin's 'tragedy thesis" of the 1968 and the frightening new ideas about sharp population declines of many species, particularly from the ocean (Dietz et al., 2002). The central message of Hardin's paper is a revamped Malthusian warning against unrestrained freedom of reproduction in a world of finite resources; and his prescription was coercive regulation (Yeraswork, 2000).

A key challenge to Hardin's model came from researchers familiar with diverse common property institutions in the field. The first type of criticism maintains that the characterization of the common property as a system that necessarily leads to competitive over-exploitation and the unavoidable destruction of resources is based on unfounded assumptions and dubious conceptual grounds (Yeraswork, 2000; Dietz et al., 2002). While *Property Rights School* somewhat sticks to that of Hardn's view, significantly large number of scholars, through their vast empirical work, could testify that there are evidences that CPRs have been successfully managed and that CPRs users often devise institutional arrangements to resolve these dilemmas (Wade, 1988; Ostrom, 1990; Baland and Platteau, 1996; Agrawal, 2002; Matsaert, 2002).

Many scholars have recognized that institutions play a key role in shaping how CPRs users coordinate their actions to solve supply and demand dilemmas (Heikkila, 2004). As to the effectiveness of CPRs management, the balance of evidence from *the commons'* literature of the past few decades is that neither purely local-level management nor purely high level management works well by itself. Rather, there is a need to design and support

management institutions at more than one level, with attention to interaction across scale from the local level up (Berkes, 2002).

What have Some Scholars Suggested for Effective Management of CPRs?

Since Hardin's influential paper, a lot of scholars have been interested in looking for some viable solutions for effective CPRs management. While Property Rights School somewhat sticks to that of Hardin's view, several scholars argued against and tried to forward alternative ideas. Ostrom (1990) listed eight design principles in her defining work on community level governance of resources (Agrawal, 2002). Wade (1988) finds fourteen conditions to be important in facilitating successful management of *the commons* he investigated. Baland and Platteau (1996), in their comprehensive and synthetic review of a larger number of studies on *the commons*, came up with similar position to that of Ostrom (Ibid). The under-listed are some of the basic recommendations/principles for effective management of CPRs set by Baland and Platteau (1996), Wade (1988), and Ostrom (1990) (see the synthesis in Box 2.1).

- The smaller and the more clearly defined the boundaries of the CPRs, the greater the chance of success.
- Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must be the boundaries of the CPR itself.
- The smaller the number of users the better the chances of success. But it is also true that large groups may sometimes succeed in carrying out CPR-management schemes.
- The greater the overlap between the location of the CPR and the residence of the CPR users, the greater the chances of success.
- The better the knowledge of the users of sustainable yields the greater the chances of success.
- The more the users have already joint rules, for purposes other than CPRs use, and the more bite behind those rules, the better the chances of success.
- The more noticeable is cheating on agreements the better the chances of success
- The less the state can or wishes to undermine locally based authorities, the better the chances of success.

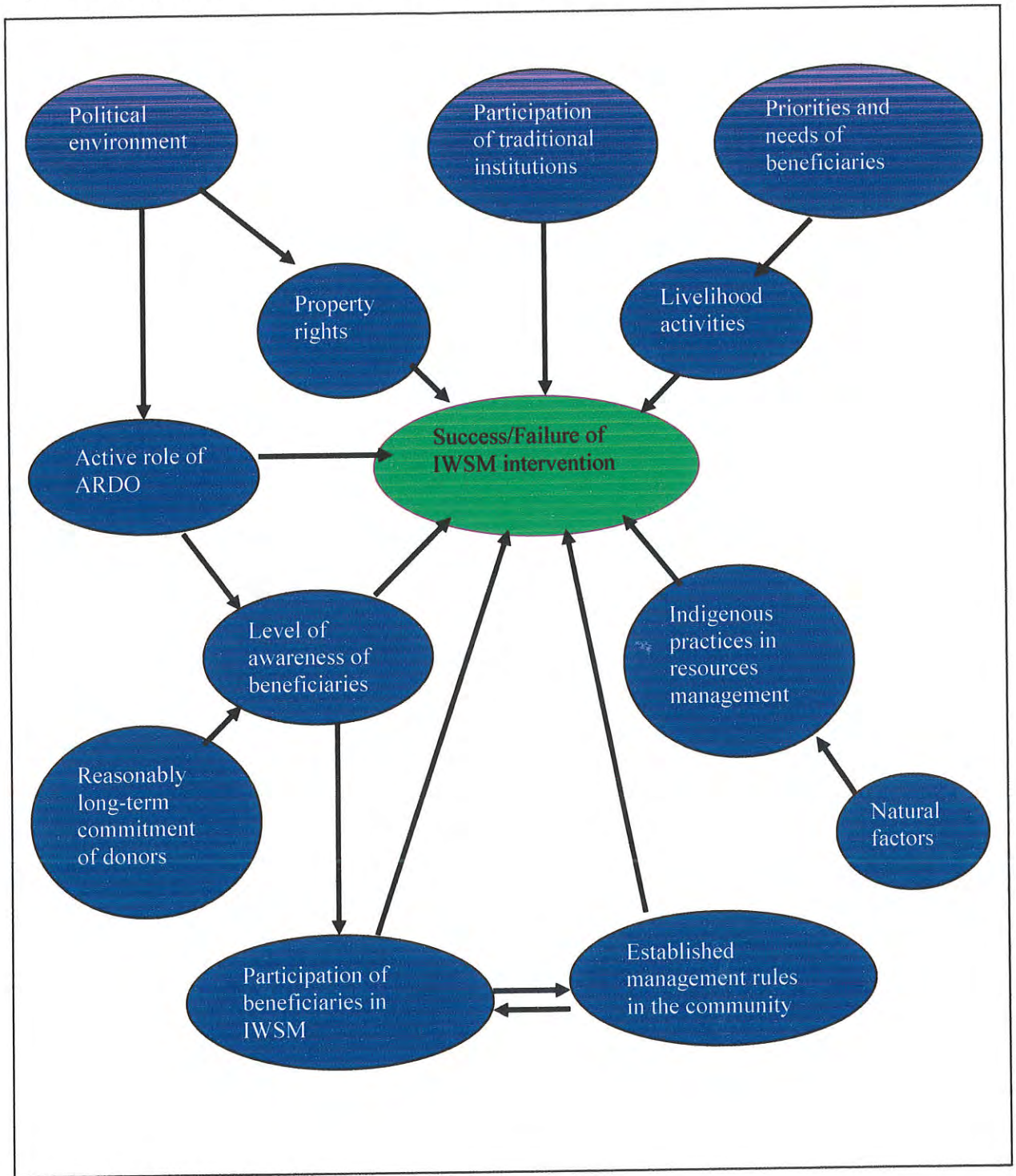
- The better the perception of the users of the potential benefits of collective action the greater the chances of success.
- In situations involving conservation problems, the higher the external provision of appropriate economic incentives, the greater the chances of success. Every proposed CPR initiative must offer meaningful incentives to the people who should carry it out (IFAD, 1995).
- Appropriate conflict resolution mechanisms should be in place.

2.3. The Analytical Framework

2.3.1. Factors that Affect Integrated Watershed Management

As discussed in sub-section 2.2.5 above, success/failure of a particular watershed management program depends on several factors, which could be bio-physical, socio-economic, and institutional. Factors such as political environment, property rights, livelihood activities, priorities and needs of beneficiaries, participation of different stakeholders in watershed intervention, natural factors, level of awareness of beneficiaries, indigenous practices in resources management, traditional institutions, and established management arrangement play key role in the success/failure of a certain watershed management program (see Fig. 2.1).

Fig 2.1: Linkage between the different determinants of a successful IWSM



Source: developed by the author
Note: the factor at the head of the arrow is affected by the one at the tail of the arrow

2.3.2 Conditions for Effective Governance of CPRs

Box 2.1 summarizes the different facilitating conditions identified by Wade, Ostrom, and Baland and Plattea to be important in promoting sustainable use of CPRs.

Box 2.1: A synthesis of facilitating conditions for effective governance of CPRs identified by Wade (RW), Ostrom (EO), and Baland and Platteau (B&P)

1) Resource system characteristics
i) Small size (RW)
ii) Well-defined boundaries (RW, EO)
2) Group Characteristics
i) Small size (RW, B&P)
ii) Clearly defined boundaries (RW, EO)
iii) Shared Norms (B&P)
iv) Past-successful experiences-social capital (RW, B&P)
v) Appropriate leadership- young, familiar with changing external environments, connected to local traditional elite (B&P)
vi) Interdependence among group members (RW, B&P)
vii) Heterogeneity of endowments, homogeneity of identities, and interests (B&P)
(1 and 2) Relationship between resource system characteristics and group characteristics.
i) Overlap between user group residential location and resource location (RW, B&P)
ii) High levels of dependence by group members on resource system (RW)
iii) Fairness of allocation of benefits from common resources (B&P)
3) Institutional Arrangements
i) Rules are simple and easy to understand (B&P)
ii) Locally devised access and management rules (RW, EO, B&P)
iii) Ease in enforcement of rules (RW, EO, B&P)
iv) Graduated sanctions (RW, EO)
v) Availability of low-cost adjudication (EO)
vi) Accountability of monitors and other officials to users (EO, B&P)
(1 and 3) Relationships between resource system and institutional arrangements
i) Match restrictions on harvest to regeneration of resources (RW, EO)
4) External Environment
i) Technology: Low-cost exclusion technology (RW)
ii) State:
a) Central government should not undermine local authority (RW, EO)
b) Supportive external sanctioning institutions (B&P)
c) Appropriate levels of external aid to compensate local users for conservation activities (B&P)
d) Nested levels of appropriation, provision, enforcement, governance (EO)
Sources: Wade (1988); Ostrom (1990); and Baland and Platteau (1996)

Source: Agrawal, 2002

Irrespective of their wider dimensions and meanings, as to the scope of this study, the terms, success and failure are operationally limited to be measured against three broad indicators. These indicators include: the achievement of the program objective, application of proper implementation process, and establishment of appropriate management arrangement. Emphasis is also given on the management of CPRs. The presence/absence of the following specific indicators was considered as a measure of success/failure of the watershed intervention.

- Better current bio-physical condition of the micro-watershed (as a result of the watershed intervention) as compared to the situation before treatment.
- The presence of locally evolved, simple, clear, enforceable, and well articulated rules/by-laws for the management of the micro-watershed.
- Participatory approach in the whole process of intervention.
- Cleary defined boundary of both the resource and the resource users per se
- Appropriate and committed local leadership; and upper level supportive institutions
- Mutual consent among the watershed community on benefit and cost sharing
- Effective conflict resolution mechanisms
- Willingness and commitment of the beneficiaries to participate in the whole process of intervention, maintenance, and further development.
- Active participation of all stakeholders in with clear and working chain of linkage/co-operation among and within the local (internal) and upper level (external) actors.

CHAPTER THREE
METHODOLOGY

This chapter presents the research methodology followed in an attempt to address the stated objectives of the study. It is sub-divided in to five sub-sections, namely, selection of the study sites, sampling procedure, data sources, methods of data collection, and methods of data analysis

3.1. Selection of the Study Sites

Having the stated objectives and defined criteria of success and failure in mind, preliminary assessment was done by the researcher in the Blue Nile basin among the GTZ treated micro-watersheds from the year 2001-2004 under the GTZ-IFSP-SG. Magera (failed) and Kanat (successful) micro-watersheds, located in Farta w*oreda*, in South Gondar Administrative Zone (SGAZ) of the ANRS are found to be appropriate for a number of reasons; First, the testimony from different stakeholders and personal observation of the sites in light of the specific criteria set forth indicated that Kanat is successful while Magera is failed out of the twenty five treated micro-watersheds in South Gondar Administrative Zone (SGAZ). Second, it is known that no any previous specific evaluation or empirical study has been conducted in the sites with respect to socio-economic and institutional dynamics of the IWSM. Third, it is found to be convincing that it is rational to draw lessons from one successful and one failure cases under similar or nearly similar socio-economic and bio-physical contexts than considering two cases under different contexts. Because this gives the researcher a chance of having better control over the influence of the difference in contexts on the output of the study; and thus a chance to better avoid possible biases. Fourth, the researcher is convinced that for studies that focus on institutional dynamics of IWSM, comparative approach is appropriate than both the *before-and-after* and *a control-experimental* approaches.

3.2. Sampling Procedure

Kanat micro-watershed with a total of 230 beneficiaries constitutes four *gotes*[3] of a *kebele*[4] (KA), namely Hiruy Abaregay in Farta *Woreda. In the same way, Magera micro-watershed* with a total of 250 targeted beneficiaries constitutes four gotes of a KA, namely Wowana Magera of the same woreda (see table 3.1). All the beneficiaries in both micro-watersheds live in a confined area and all the *gotes* are adjacent to each other. Moreover, all the *gotes* are found to be geographically convenient (easily accessible) to conduct household survey questionnaire without unnecessary waste of time and cost. Given these conditions, it was decided to draw sample households purposively from each *gote* so as to increase the representativeness of the sample.

In consultation with the *woreda* agriculture office staff, *Kebele (KA) administrations*, and development agents, a total of 96 households heads (46 [20%] from Kanat and 50 [20%] from Magera) were purposively selected from the eight *gotes*[5] in the two *Kebeles* for the household head interview (see table 3.1). While selecting the households purposively, three major factors, namely social responsibility, sex, and age of the individuals are considered. The sample size is found to be reasonable for the researcher given the time, budget and the required information.

[3] *Gote* is a local name for hamlets. It is a subdivision of *kebele*
[4] Kebele is the smallest administrative echelon in Ethiopian government structure

Table 3.1: Distribution of sample households over the different *gotes*

Micro-watershed	***Gotes***	**Number of total households in the *gotes***	**Number of sample households**
Kanat	Melaja	56	11
	Dinsr	58	12
	Addis alem	62	12
	Abiredagn	54	11
Magera	Wado Mender	58	12
	Koleha	62	12
	Matina	64	13
	Girgy	66	13

Source: own household survey, 2009

Purposive sampling was preferred for a number of reasons. It is found to be convincing for the researcher to include people purposively from different social responsibilities like religious leaders, elders and influential leaders, *KA* leaders, and ordinary community members (see Table 3.2). Given the different roles, experiences, and outlooks of these people in the community, collecting data from such a diverse group is believed to help have a better investigation in to the issues in question, especially, conflict resolution, the nature of land degradation before intervention, and the role of traditional institutions. This explanation also holds true for considering the different age ranges purposively. Moreover, purposive selection enables the researcher to include female respondents. Table 3.2 provides a summary of some important characteristics of the purposively selected survey respondents including, sex, social responsibility, and age of the respondents.

Table 3.2: Some selected characteristics of the survey respondents

Characteristics		Kanat		Magera	
		Frequency	Percentage	Frequency	Percentage
Sex	Male	35	76.1	39	78.0
	Female	11	23.9	11	22.0
	Total	46	100	50	100.0
Social Responsibility	Religious leader	8	17.4	5	10.0
	KA leader	3	6.5	2	4.0
	Elder	9	19.6	11	22.0
	Ordinary community member	26	56.5	32	64.0
	Total	46	100	50	100.0
Age	30-40	6	13.0	4	8.0
	41-50	20	43.5	22	44.0
	51-65	19	41.3	20	40.0
	>65	1	2.2	4	8.0
	Total	46	100.0	50	100.0

Source: own household survey, 2009

3.3. Data Sources

Multiple data sources were used for the study so as to help the investigator come up with valuable explanation for existing relations among the variables of interest. Primary data was collected from all the involved stakeholders by using different research instruments. The stakeholders include the beneficiaries, *woreda* and zonal level agricultural experts, land use and administration experts, DAs, and GTZ-SUN Amhara Debre Tabor staff. Secondary data is also collected from published and unpublished sources.

3.4. Methods of Data Collection

3.4.1. Primary Data Collection

With the aim of making the data collection process manageable, the investigator first made contact with the local authorities/administration, w*oreda* ARDO staff, GTZ staff, and the relevant development agents and had some preliminary general discussions. The discussion focused on such issues as land degradation, local response to land degradation, the implementation of the watershed intervention, and major stakeholders involved. Semi-structured household survey questionnaire was used to interview the selected households. In addition, checklists were used to gather facts from focus group discussions and key informant interviews. Personal observation was also undertaken.

A) Semi-Structured Household Survey Questionnaire

Semi-structured household survey questionnaire was employed to gather data from the sum total of 96 selected households from both sites. The questionnaire was pre-tested by the researcher and two trained enumerators and some slight amendments were made to it. Then further briefing was done for the enumerators based on the feedbacks obtained from the pretest so as to ensure the appropriateness of the data to be collected from the field. The survey was then conducted by the enumerators and the researcher. The survey mainly focused on gathering facts on constraints to agricultural production, the causes and types of land degradation in the study sites, the most important stakeholders involved in the watershed intervention and their respective roles. The survey was also aimed at gathering information on the basic reasons behind success and failure of the respective watershed interventions, the contribution of the different actors to success/failure, sources and ways of handling conflict, and the benefits accrued from the watershed intervention.

B) Key Informant Interviews

During the preliminary assessment and discussions with some stakeholders, the researcher identified some people (from all the stakeholders) that have directly and actively involved in the watershed intervention. A total of eight (three from beneficiaries, two from GTZ, and three from government staff) key informants were selected from these people and interviewed. The key informant interviews were employed to collect facts on land degradation, the whole process of implementation of the watershed intervention, and the establishment of the management arrangement. The major stakeholders involved, the reasons behind success and failure, and the overall institutional arrangements were also scrutinized through the key informant interviews and cross-checked with the data from the household interview and FGDs.

C) Focus Group Discussions

Five FGDs (two from beneficiaries, two from government staff, and one from GTZ staff) were conducted with participants from the major stakeholders (see Annex IV). The stakeholders include beneficiaries from the two micro-watersheds, Debre Tabor town Office of Agriculture (DTTOA) staff, FWARDO staff, and GTZ staff. Both the government and GTZ staff FGDs included those that have different roles in the whole process of watershed intervention and that have good knowledge about the socio-economic and biophysical background of the study sites. They are selected based on the information obtained during the preliminary assessment as it holds also for the key informants. The farmers' focus groups were selected based on the information given by KA administration, *woreda* ARDO experts, and DAs about their know-how and level of participation in the whole process of watershed intervention and establishment of the management arrangement. The discussions included all the issues addressed by the household survey and the key informant interviews.

D) Observation

Observation was held by the researcher by using a transect walk within the micro-watersheds and the *kebeles* at large with key informants. Some pictures were also taken at different sites to help the researcher clearly document/present the current bio-physical state of the micro-watersheds. Moreover, during the transect walk, the researcher was comparing the current state of the micro-watersheds with some pictures of the site taken by GTZ before and during the implementation of the watershed management program.

3.4.2. Secondary data Collection

Secondary data sources, namely, research reports, official reports and plans, information pack/basic information records, and stakeholders' meeting Minutes were also used to support and triangulate data from primary sources. Most of these are obtained from GTZ-SUN Amhara Debre Tabor office and FWARDO.

3.5. Methods of Data analysis

Statistical Package for Social Scientists (SPSS) version 15 was employed to tabulate the responses from household survey. Simple analytical tools, namely, descriptive statistics like percentage, frequency distribution for single variable and multiple responses, and mean were employed. Analysis of qualitative data obtained from the FGDs and Key informants was began side-by-side with the field data gathering process and later on aligned with the analysis of quantitative data throughout the write-up process. Field notes taken each day were carefully written in organized manner that same day and categorized under the major themes of the research. Content analysis technique was employed to critically identify important points and notes related to the objectives of the research. These qualitative facts are analyzed and incorporated in to the report through narrative description and direct quotation of the key informants whenever necessary. Data from secondary sources were also carefully reviewed and checked for their reliability, validity, and consistency. Data from different sources were cross-checked thoroughly throughout the analysis process so as to maintain objectivity.

CHAPTER FOUR

STUDY AREA AND SAMPLE HOUSEHOLDS CHARACTERISTICS

The first sub-section of his chapter provides some facts on the geography and climate of the study sites. Following this, four important issues related to the socio-economic situation of the households, namely livelihood activities, access to farmland and livestock, constraints to agricultural production, and some facts on land degradation are briefly discussed.

4.1. Geography and Climate

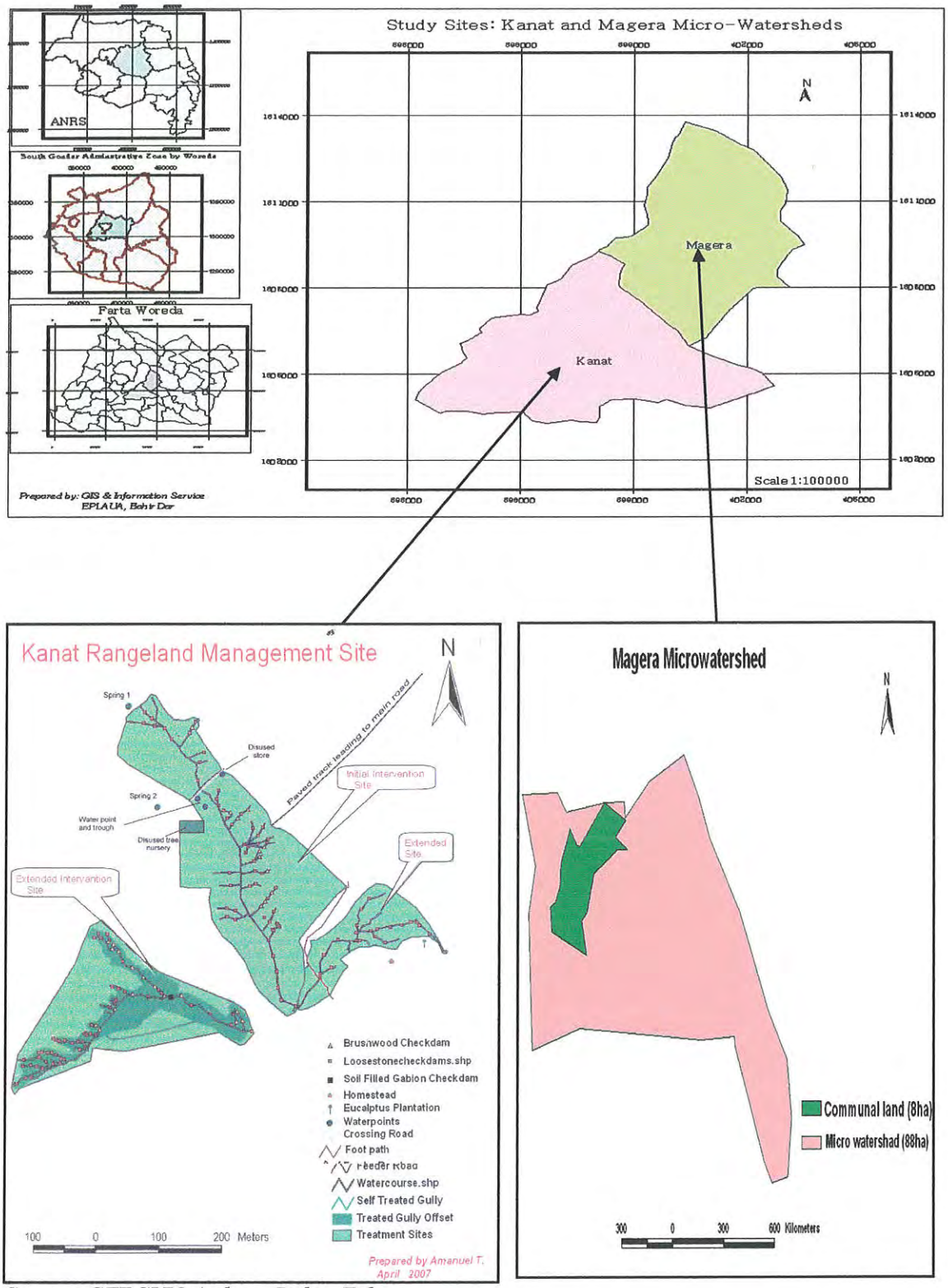
South Gondar Administrative Zone (SGAZ), with a total area of 14, 300 km^2 is one of the administrative zones of the ANRS. It is known for its mountainous rugged terrain type of topography with an altitude ranging from 1800 - 3300 masl. The average mean annual temperature is 17^0C. With typical unimodal pattern (from May to September), the total annual rainfall falls within the range of 700 – 1200 mm per annum. Andosols, Rigosols, and Cambisols are the dominant soil types. The Zone hosts approximately 2 million inhabitants with an average population density of 137 persons per Km^2 and with an average family size of six persons.

Farta *woreda*, where the study sites, namely, Kanat and Magera, are located is one of the *woredas* located in SGAZ. It lies at $11^0$32' to $12^0$3'N latitude and $37^0$31' to $38^0$43'E longitude, and covers an estimated area of 1118 Km^2. Regarding the topography, 45% of the total area is gentle slope, while flat and steep slope lands account for 29% and 26% respectively (Yitbarek, 2007). *Woinadega* (moderately cold), *dega* (cold), and *wurch* (very cold) account for 56%, 41%, and 3% of the *woreda*'s major agro-ecological zones respectively (FWARDO, 2006). The average annual minimum, maximum and mean temperatures are 9.7 ^{0}C, 22 ^{0}C and 15.5 ^{0}C respectively. The rainfall pattern is unimodal stretching from May to September. Annual rainfall ranges between 1097 and 1954 mm with a long term average of 1448 mm (Tamene H/Giorgis, 1997 as cited by Yitbarek, 2007). The dominant soil types include those that are mentioned for SGAZ.

Kanat (a total of 112ha) and Magera (a total of 88ha) are micro-watersheds located at 5Km and 8Km east of Debre Tabor (the capital of SGAZ) respectively along the Woldiya-Woreta road. They are found in adjacent *Kebeles* in Farta *Woreda*, the former being in Hiruy-Abaregay *Kebe*le and the latter in Wowana-Magera KA. The average rainfall, temperature and altitude of the study sites are 1450mm, 17^0c, and 2630 masl respectively. The sites are among the micro-watersheds that were under the GTZ-IFSP-SG. Out of the 112ha of Kanat micro-watershed, 75ha is communal grazing land while the rest 37ha is farmland. Out of the total 88ha of Magera, 80ha is farmland while the rest 8ha is communal grazing land.

The micro-watersheds are two of the total of 25 micro-watersheds that were treated by German Technical Cooperation-Integrated Food Security Program-South Gondar (GTZ IFSP-SG) in 2004 and 2003 respectively. Kanat micro-watershed, where there are a total of 230 beneficiaries is claimed to be successful by different stakeholders including GTZ, some beneficiaries, and FWARDO staff (among the treated sites). It is known that the site has remained a typical experience sharing center for farmers from different administrative zones in ANRS. On the other hand, Magera, where there are a total of 250 targeted beneficiaries and, which has undergone almost similar treatment, is claimed by the stakeholders to be a complete failure. Though the treatment had stopped heavy gully formation and heavy soil erosion by water for a certain period of time, the problem has re-appeared shortly after GTZ's interaction ceased. Testimony from all the involved stakeholders and the researcher's personal observation of the current bio-physical condition of the site indicated that there have been persistent land degradation in the form of soil erosion and overgrazing in the site. The site represents one of the typical failure cases of watershed interventions.

Fig 4.1: Map of the study sites



Source: GTZ SUN-Amhara Debre Tabor

4.2. Major Livelihood Activities

Livelihood activities of beneficiaries in a watershed dictated by priorities and needs of the community, play key roles in the success/failure of a certain watershed management program (see Fig 2.1). The beneficiary *kebeles*, namely, Hiruy Abaregay (where Kanat is located) and Wowana Magera (where Magera is located) are typical of the so-called mixed crop-livestock farming system. Crop production stands as the major form of economic activity followed by livestock production. Survey results have shown that very few people are engaged in non-farm activities including carpentry, petty trade, and agricultural labour work as a supplementary source of income. As to the type of the major crops produced in the area, maize, potato, pepper, triticale[6], wheat, teff, barley, and field peas are widely grown in the beneficiary *kebeles*.

4.3. Access to Farmland and Livestock

It is known from the household survey that most of the respondents have their own livestock (87.5%) and farm land (89.6%) (see Table 4.1). According to FWARDO (2006), the average land holding size of Farta *woreda* in general is 0.75ha. The survey result (see table 4.2) has shown that the average land holding size is 0.63ha and 0.67ha for Kanat and Magera respectively. Discussions with key informants and FGDs also indicated that sharecropping is the most important means to access land by those who do not have their own land.

[6] is a cereal crop and a cross between wheat and rye.

Table 4.1: Access to farmland and livestock.

Do you have your own farmland?		Kanat (N=46)		Magera (N=50)		Total (N=96)	
		Responses	**% of cases**	**Responses**	**% of cases**	**Responses**	**% of cases**
1	Yes	42	91.3	44	88.0	86	89.6
2	No	4	8.7	6	12.0	10	10.4
Total		46	100.0	50	100.0	96	100
Do you have your own livestock?							
1	Yes	41	89.1	43	86.0	84	87.5
2	No	5	9.9	7	14.0	12	12.5
3	Total	46	100.00	50	100.0	96	100

Source: own household survey, 2009

Table 4.2: The mean, minimum and maximum land holding size of the sample households in *ha.*

What is the size of your land in ha?	N	Minimum	Maximum	Mean
Kanat	46	0.25	1.25	0.63
Magera	50	0.25	1	0.67

Source: own household survey, 2009

Regarding the trend in land holding size, the survey results and discussions with farmers' focus groups have shown that it is decreasing (91.7%) over time due to repeated reallocation among family members (see Table 4.3). The decline in land holding was emphasized by the respondents to be one of the big challenges to agricultural production. This response aligns with the information available for SGAZ in general (see Fig 5.1).

Table 4.3: Trend in land holding size

What is the trend in your land holding size?		Kanat (N=46)		Magera (N=50)		Total (N=96)	
		Responses	%of cases	Responses	% of cases	Responses	% of cases
1	Increasing	-	-	-	-	-	-
2	Decreasing	40	87.0	48	96.0	88	91.7
3	No change	6	13.0	2	4.0	8	8.3
	Total	46	100.0	50	100.0	96	100

Source: own household survey, 2009

4.4. Constraints to Agricultural Production

Delayed rainfall, prompt cut of rainfall, lack of farm oxen, disease and pest, soil fertility loss, high cost of agricultural inputs, frost and wind, soil erosion by water, and shortage of farm land are the major challenges to crop production and productivity in Farta *woreda.* With regard to animal production, the major challenges are shortage of range land, animal disease, lack of enough feed, and range land invasion by toxic grass and weed species (FWARDO, 2006; GTZ and BoA, 2002; GTZ, 2004). Primary data from the study sites have also shown that most of these constraints are evident in the study sites too.

Table 4.4: Constraints to crop production

What are the major constraints to crop production in your locality?		Kanat (N=46)		Magera (N=50)		Total (N=96)	
		Responses	%	Responses	%	Responses	%
1	Erratic rainfall	40	87.0	42	84.0	82	85.4
2	Labor shortage	12	26.1	10	20.0	22	22.9
3	Input shortage	36	78.3	43	86.0	79	82.3
4	Drought	32	69.6	38	76.0	70	72.9
5	Land shortage	38	82.6	44	88.0	82	85.4
6	Soil erosion by water	40	87.0	46	92.0	86	89.6
7	Pest and disease	11	23.9	23	46.0	34	25.4

Source: own household survey, 2009

Among the aforementioned constraints to crop production, input shortage, land shortage, and soil erosion by water are given special emphasis during the FGDs with farmers and the government staff. Input shortage here is specifically to refer to limited access to improved seeds and agro-chemicals including fertilizer, pesticides, and herbicides. It was noted that except some few farmers, most of the farmers have no capacity to afford the sky-rocketed prices of fertilizers. Besides this there is no enough access to fertilizers sometimes even for those who can afford it. It was known from the discussions that though there is a branch office of Amhara Credit and Saving Institutition at Debre Tabor town (5Km and 8Km from Kanat and Magera respectively), most of the respondents have no experience of having loans from it for agricultural inputs. Hence, most of the farmers usually sow their crops without fertilizer and harvest low yield per hectare as a result. Livestock production in the study sites is constrained by repeated drought; feed shortage; animal disease; and lack of enough access to veterinary services (see Table 4.5). This findings agree with the general constraints identified by FWARDO for the w*oreda* in general (FWARDO, 2006).

Table 4.5: Constraints to livestock production

What are the major constraints to livestock production in your locality?		Kanat (N=46)		Magera (N=50)		Total (N=96)	
		Responses	%	Responses	%	Responses	%
1	Repeated drought	30	65.2	31	62	61	63.5
2	Feed shortage	35	76.1	42	84	77	80.2
3	Animal diseases	27	58.7	32	64	59	61.5
4	Lack of vet services	29	63	26	52	55	57.3

Source: own household survey, 2009

4.5. Some Facts on Land Degradation

4.5.1 Types of Land Degradation

Both primary and secondary data sources indicated that the study sites were among the most degraded ones in the *woreda*. Soil erosion by water, deforestation, overgrazing of

grazing land, and gully formation by a heavy rainfall were said to be the major types of land degradation before the watershed intervention in both sites (Table 4.6). In the case of Magera, these situations still hold true

Table 4.6: Types of land degradation in the micro-watersheds before the watershed intervention

What were the major types of land degradation before the watershed intervention?		Kanat (N=46)		Magera (N=50)		Total (N=96)	
		Responses	%	Responses	%	Responses	%
1	Soil erosion by water	36	78.3	44	88.0	80	83.3
2	Deforestation	34	73.9	36	72.0	70	72.9
3	Overgrazing	40	87.0	43	86.0	83	86.5
4	Gully formation	39	84.8	45	90.0	84	87.5
5	Water logging	21	45.7	11	22.0	32	33.3

Source: own household survey, 2009

It is mentioned in sub-section 4.4 above that the *woreda* in general is known for heavy soil erosion by water. It was emphasized by FGDs and key informants that soil erosion by water is one of the most important factors that have been translated in to decline in crop production and productivity year after year. Increase in both animal and human population coupled with decline in land holding size has resulted in the third threat, overgrazing, which again and further exacerbates the fourth element in the vicious circle viz. soil erosion by water. According to the discussants, soil is heavily washed from all types of lands in the *kebele* including farmlands, grazing lands, and marginal lands.

4.5.2 Causes of Land Degradation before the Watershed Intervention

The lion share of land degradation was accounted to overstocking (86.5%) in the case of the communal area with all its spillover damages to the farmland. Free grazing regime was (still holds in the case of Magera) a typical culture among both communities. The picture[7] in the right (Fig 4.2) shows that there were overgrazing and soil erosion reinforcing each other in Kanat before the watershed intervention. Cutting trees for fuel wood and construction coupled with limited and ineffective use of conservation structures were also among the immediate causes (next to overstocking) that exacerbated land degradation before the watershed intervention. Heavy rainfall was also among the proximate cause of degradation in both micro-watersheds before treatment. In the case of Magera, the degrading effect of heavy rainfall is somewhat augmented by the steep topography. Table 4.7 shows the major causes of land degradation in the micro-watersheds before the watershed treatment as responded by the household head interviewee and also as further elaborated by FGDs and key the informants.

Fig 4.2: Overstocking as a cause of land degradation

[7] Unless labeled 'own', all the pictures in this thesis are taken from GTZ and BoA, 2005 (a power point presentation document)

Table 4.7: Causes of land degradation in the micro-watersheds before the watershed intervention

What were the immediate root causes of land degradation before the watershed intervention?		Kanat (N=46)		Magera (N=50)		Total (N=96)	
		Responses	**%**	**Responses**	**%**	**Responses**	**%**
1	Overstocking	39	84.8	44	88.0	83	86.5
2	Cutting trees	30	65.2	41	82.0	71	74.0
3	Limited use of conservation practices	29	63.0	32	64.0	61	63.5
4	Heavy rainfall	27	58.7	36	72.0	63	65.6
5	Steep topography	-	-	34	68.0	34	35.4

Source: own household survey, 2009

The following picture (Fig 4.3) shows partial view of the state of the micro-watersheds before the watershed intervention

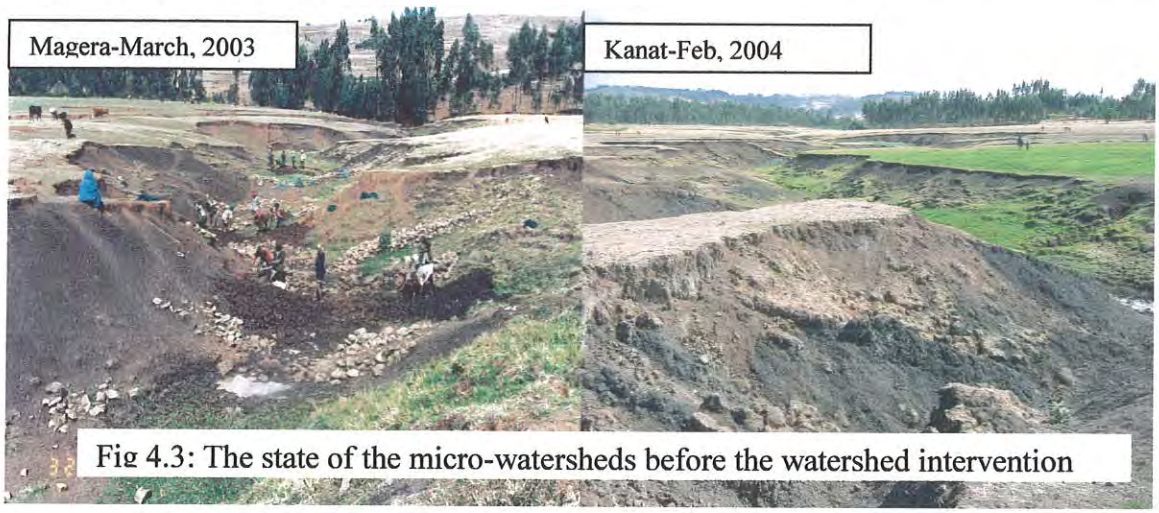


Fig 4.3: The state of the micro-watersheds before the watershed intervention

4. 5.3. Local Responses to Land Degradation

According to the survey respondents both from Magera and Kanat, terraces and stone bunds were the most frequently used physical structures used for soil and water conservation in the sites before the watershed intervention. However it was noted from the discussions held with FGDs and some key informants that the terraces and the stone bunds

were of poor quality that stay only for a short period of time, in fact until they face a repeated heavy rainfall. Moreover, the potential positive impacts of the conservation attempts had also been reversed by the simultaneous devastating act of the farmers themselves, viz. free grazing. No promising biological mechanisms were used till GTZ IFSP-SG has introduced the plantation of multi-purpose fodder and tree species meant to serve a double purpose – rehabilitation of degraded land and tackling the problem of livestock feed shortage.

CHAPTER FIVE

The Integrated Watershed Management Intervention in the Study Sites

This chapter presents the whole process of the implementation phase of the watershed intervention in the study sites. To this end, such major themes as the planning process, implementation, major stakeholders involved, major activities undertaken, benefits accrued from the intervention, and challenges faced during the implementation are discussed. The facts and figures are all based on the household survey, FGDs with the major stakeholders, key informant interviews of the major stakeholders, secondary data, and personal observation.

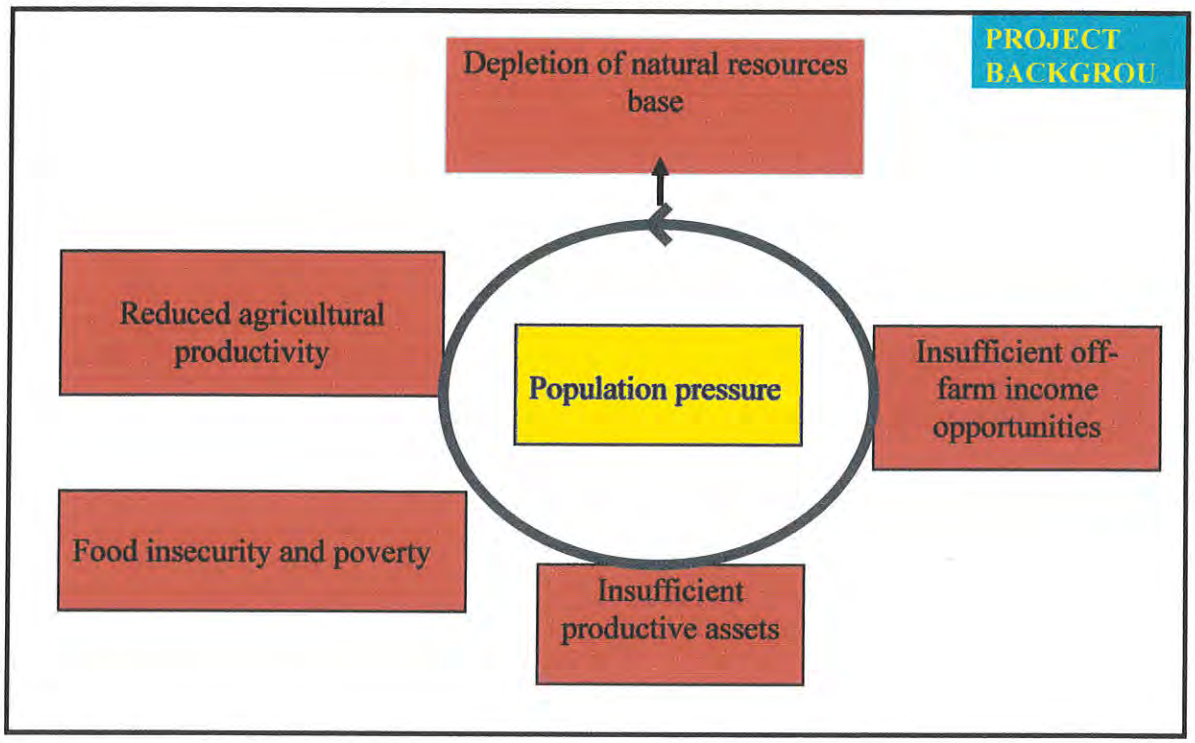
5.2.1 Background and Rationale to GTZ IFSP-SG

SGAZ has a history of food shortage and has experienced several serious famines, also in recent years (GTZ, 2004). It is evident that a large number of farm families are even in normal years hardly capable to produce sufficient food or to generate sufficient income for their subsistence needs. This has progressively impoverished the population and exhausted its productive capacity. The main causes of the insufficient food production are repetitive droughts, but also crop damages due to hail attacks, frost and pests. Nevertheless, the root causes of the problem are shortage of productive land, inappropriate means and techniques of production, and improper agricultural and natural resources management practices. Poor infrastructure, inadequate extension services and limited off-farm as well as on-farm income generating and marketing opportunities, among others, are also factors limiting the households' purchasing power (Ibid).

In general, population pressure, high dependency of rural population on agriculture, deforestation and depletion of forage resources, soil erosion, and soil compaction are known to be the major problems in SGAZ, leading to accelerated deterioration of natural resources, low agricultural productivity, food insecurity, and high dependency on food aid (BoA and GTZ, 2002). Moreover, South Gondar with its high demographic dynamics experienced different misutilization and mismanagement of natural resources. The fertile

top soil has been washed down resulting in the reduction of the productive potential of different land use types (GTZ, 2006). Centered by population pressure, the vicious circle below (Fig 5.1) shows the nexus among depletion of natural resource base, reduced agricultural productivity, food insecurity and poverty, insufficient off-farm income opportunities, and insufficient productive assets in SGAZ.

Fig 5.1: Vicious circle that shows the rationale behind GTZ IFSP-SG.



Source: BoA and GTZ, 2002

Given this background, IFSP-SG, which started in mid 1996, is a program financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented in cooperation with BoA, Amhara Region and Tigray Region in some selected *woredas* in the regions. The programme aimed at improving the situation of food insecure households in SGAZ and selected areas in Tigray Region by the application of innovative production methods and techniques on the basis of a sustainable management of natural resources (GTZ, 2004).

After some years of project implementation, GTZ IFSP-SG has concentrated all interventions into an "Integrated Watershed Management" since 2001. Accordingly, all project components have been implemented in micro-watersheds. The major components/activities undertaken under the micro-watershed treatment program include: introduction of triticale; gully rehabilitation including nursery development, stabilization of field bunds by vetiver grass in combination with leguminous fodder shrubs and/or fast growing grasses; introduction of modified plough, supporting road construction and maintenance, and watering points development activities (protection of springs and hand dug wells) (Ibid). Kanat and Magera of Farta *woreda* are two of the total 14 micro-watersheds treated across the 6 target *woredas* until the end of 2004.

5.2.2 The Planning Process

A proper planning of watershed intervention is the one which considers the whole range of important bio-physical, social, cultural, financial, and political considerations for all concerned stakeholders (Tennyson, 2005). According to Achouri (2005), improper planning is one of the reasons behind failure of most of the watershed management programs in Africa. The less success of soil and water conservation programs of the 1970s and 80s in Ethiopia has also a lot to do with improper planning methods followed. The planning process was essentially top-down where the involvement of the grass root communities was not considered to have any significant contribution.

Having lessons from its own and others' past experiences and based on the *"Local Level Participatory Planning Approach (LLPPA)"* GTZ has developed its own *Participatory Project Approach* (see Box 5.1). The approach focuses on enhancing the community's capacity to plan and manage their own watershed programs.

Box 5.1: Participatory project approach of GTZ IFSP-SG for IWSM

1. *The population in the project area is informed about the possibility to request project support for the rehabilitation and the development of their watershed.*
2. *Interested communities submit their requests to the respective Office of Agriculture (OoA), and OoA undertakes further prioritization.*
3. *In each selected watershed, planning according to the "Local Level Participatory Planning Approach (LLPPA)" is undertaken by Development Agents (DA) and Experts of the OoA.*
4. *An integrated watershed development plan is prepared, a watershed committee elected by the local population, and an agreement made on the activities to be undertaken, including the required contribution of farmers. Farmer to farmer visit programmes proved to be very successful.*
5. *The watershed development plan is submitted to IFSP-SG for technical assistance and funding of activities.*
6. *The activities according to the watershed development plan are implemented.*
7. *Training is given in the sustainable utilization (management) of the rehabilitated areas, with an emphasis on "cut and carry" system*

Source: GTZ, 2004

Most of the survey respondents, all the key informants and FGD members in Kanat have assured that the above steps were more or less strictly followed during the planning process. Ato Markos Habtu, the KA administrator and a key informant put the actual planning steps followed during the watershed intervention as follows:

1. *After observing some sites treated by GTZ elsewhere, we (the KA administration) asked GTZ to treat our degraded communal land and farmland around it in Feb, 2004. ourobjective was to have our degraded land healed.*
2. *Then a concerned GTZ staff told us that GTZ is willing to accept our request but if and only if we were to take the responsibility for sustainability of the intervention and contribute our share as per the project demand.*
3. *Then I and other five people from our KA together with one DA have visited Magera (previously treated micro-watershed found at adjacent KA) and we found it very interesting.*
4. *Then we (those who visited other sites) organized meeting for our community and convinced them after a long discussion*
5. *Then we reported to GTZ that we all are convinced and are ready to contribute our share if they (GTZ) were willing to support us.*
6. *GTZ then came and assured it in another meeting organized in the presence of all the beneficiaries*
7. *It is after this process that the intervention started in late Feb, 2004. The major undertakings include introduction of triticale, gully rehabilitation, watering points development, feeder roots and foot paths construction, and introduction of improved plough.*

Ato Olana Sifen, a key informant and a *Natural Resource Senior Officer* in GTZ IFSP-SG at Debretabor, in his part put the planning steps followed in Kanat as follows:

1. *Farmers from Kanat first visited (by own willingness) other sites treated by GTZ prior to Kanat.*
2. *They then submitted a proposal through their KA administrator to GTZ for technical and financial support in Feb, 2004.*
3. *GTZ then told the KA administrator that the organization wants to make sure that whether the whole community agrees with the idea of intervention or not.*
4. *Meeting was arranged and discussions were held with the whole community*
5. *General consensus was reached in the meeting where the majority of the community got convinced while some still not*
6. *Temporary watershed committee (WSC) of 10 members (out of which 3 were female) was established. The different age groups were also considered during the establishmenet.*
7. *The established committee was taken to another watersheds for experience sharing visit*
8. *The committee organized another meeting for all the community when they came back. During this meeting the committee clarified what they have seen and convinced the community that they have hope for their own degraded land to be rehabilitated. However, even at this stage not everyone in the community was not convinced.*
9. *Then it was decided for 30% of the cost to be covered by the community by providing their free labor and provision of local construction materials while the rest 70% of the cost is covered by GTZ (through provision of material and technical support).it after going through all these steps that the investment in field started. The major undertakings include introduction of triticale, gully rehabilitation, watering points development, feeder roots and foot paths construction, and introduction of improved plough.*

The planning steps in Magera, however, took completely different line from that of Kanat. Regarding this, Ato Olana Sifen put it in the following way:

> *...in the case of Magera, we haven't followed the right planning* [the one shown in box 5.1 above] *process. What we did all was that we first brought the idea of intervention to the KA chairperson and some* 'active farmers' *in Feb, 2003* [remember that in the case of Kanat it was the community itself that requested for the intervention]. *We then had some discussions with them and directly started the intervention without seeking the consent of the whole community.*

Most of the survey respondents and key informants from Magera complained that GTZ had failed to consult and involve them in the whole process of implementation of the watershed intervention. The planning steps discussed in box 5.1 were not followed during the intervention in Magera. What was done is that GTZ first had discussed with the KA

chairperson and some farmers around the grazing land and immediately started the treatment. No long process of awareness creation and internalization process was witnessed to be followed. Though some farmers participated in the food and cash for work during the implementation of the project, it seems (from the survey respondents' and the focus group discussants' responses) that they were not convinced of the importance of the intervention.

According to some renowned CPRs Scholars (Wade, 1988; Ostrom, 1990 ; Agrawal, 2002; Baland and Platteau, 1996), one of the facilitating conditions for effective governance of CPRs is the presence of clearly defined boundaries of the resources and the resource users *per se*. With regard to the grazing land, one of the big differences in the planning process is the delineation of the boundary of users of the communal areas. In the case of Kanat, though it was only based on the administrative boundary (see the detail in sub-section 6.3), the number of beneficiaries is clearly defined during the planning process. But in the case of Magera, GTZ, FWARDO, and the KA Administration decided to close and protect the treated grazing land (which before intervention was an open access) without consent of the whole community and where there is no any defined number of users. In addition to this, gully rehabilitation was planned and undertaken on private farmlands without fully involving them in the planning process. The farmers were not empowered to manage and enhance the bio-physical conservation structures built in their farms.

It is clear from the responses that there is a big difference in the whole process of evolution of the intervention idea and the planning process between the two watershed interventions. In the case of Kanat, the source of the intervention idea is the community itself while in the case of Magera, the idea was imposed by a donor agency, namely GTZ. Here it is also important to note that the planning process followed in Kanat unlike that of Magera is essentially a kind of iterative, participatory, and empowering where the program targets are highly involved in the process starting from the very beginning. A long way of awareness raising was traversed during the whole process of planning in Kanat as opposed to that of Magera, where basically a sort of top-down approach was followed.

5.3 Major Activities

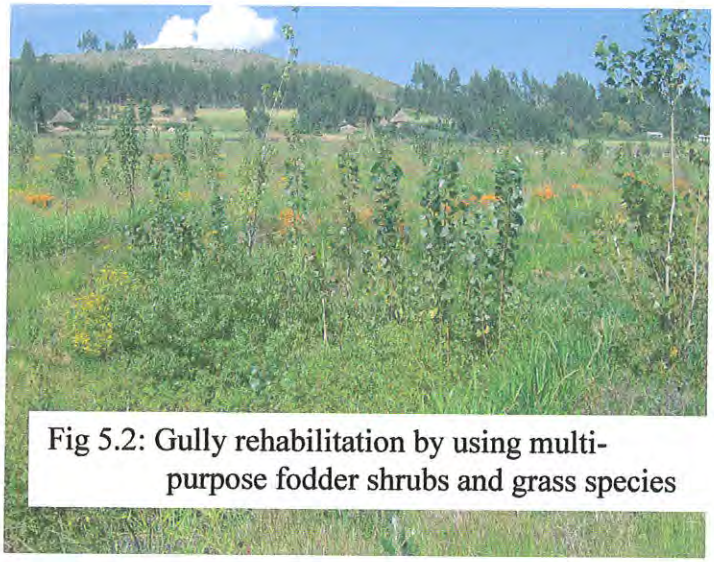


Fig 5.2: Gully rehabilitation by using multi-purpose fodder shrubs and grass species

According to Ato Olana and also as documented in GTZ (2004), GTZ's conviction was that, in practice, watershed rehabilitation is achieved by "bio-physical" soil and water conservation approach combining physical structures with biological treatment by means of the utilization of multi-purpose trees and shrubs, legumes, and grasses. The approach includes the comprehensive treatment of all land-use types, i.e. cultivated lands, grazing lands, forest areas and marginal lands within the watershed. Moreover socio-economic issues of the community are integrated to ensure sustainability of the program.

Accordingly, the watershed treatment in Kanat and Magera has included the following activities in integrated manner, which will briefly be discussed one by one:

- Introduction of triticale.
- Gully rehabilitation including nursery development
- Introduction of fast growing multipurpose leguminous fodder shrubs, trees, and grass
- Supporting roads (feeder rots and foot paths) construction and maintenance
- Watering points development.
- Introduction of the *Tenkara Kend* [8]plough
- Capacity building trainings and experience sharing visits (both for the community and DAs).
- Farmland treatment
- Alley cropping

[8] *Tenkara Kend* (an Amharic phrase to mean 'strong arm') is an oxen-pulled 'improved version of Ethiopian traditional plough developed by GTZ in consultation with a south African consultant by the name Gavin Armstrong.

A) Introduction of Triticale

Fig 5.3: Triticale production

Triticale (see Fig 5.3) is a cereal crop; and a cross of rye and wheat with some outstanding characteristics. According to GTZ (2004) the outstanding characteristics that initiated GTZ to introduce it include: its superior performance under unfavorable production conditions, including acidic soils, degraded and poor soils, severe disease and insect attack, and drought; its high yielding ability; and its excellent nutritional value both for human consumption and for livestock rations. The crop is also known for its ability to withstand heavy wind, rain, frost, and hail far better than conventional cereals such as wheat and barley. Moreover, its high biomass production and re-growth capacity after grazing are other important excellent qualities of the crop that convinced GTZ to take commitment to introduce it. The last but not least is its tolerance to water logged conditions far better than other commonly grown cereals in the sites like wheat and barley.

During the intervention the crop was sown widely in both micro-watersheds to serve a double purpose of soil bund stabilization and food provision. Discussions with several stakeholders, primarily with the beneficiaries indicated that the crop is now becoming a very promising popular crop in the *Woreda* itself. In addition to this, owing to its outstanding characteristics mentioned above, these days, there is a tendency among farmers to replace other cereal crops with it.

B) Gully Rehabilitation Including Nursery Development

i) Gully Rehabilitation

Gullies, which are intermittent stream channels larger than rills, are created by concentrated rainfall runoff from surrounding sloping land (GTZ, 2004). Usually gullies follow sheet erosion or result from neglect of rills. Most of the reasons behind gully formation include: deforestation, cultivation of steep slopes, limited fallow or vegetative cover, over-grazing, insufficient soil conservation measures following road construction or earthworks, and low cohesion between soil structures due to low soil organic matter content (Ibid).

Acciording to the key informants and survey respondents, most of the aforementioned factors behind gully formation are testified to be existent and to be the major causes of land degradation in the study sites before the watershed intervention (see Table 4.7). Review of some documents and picture galleries from GTZ also substantiated this fact. It goes without saying that gullies threaten and considerably reduce farming land, and even hinder the communication between villagers due to the destruction of footpaths and access roads (GTZ, 2004).

In general the GTZ IFSP-SG approach includes construction of physical structures such as arc weirs, gabions and loose stone check-dams in accordance with the bio-physical characteristics of the study sites. Gully rehabilitation was undertaken in both micro-watersheds both in farmland and communal grazing lands. According to the FGDs from Government offices, GTZ, and beneficiaries, the physical structures were stabilized by complementing them with the appropriate biological treatments. With regard to biological treatment, attention was given to the utilization of multipurpose plants both with immediate and envisaged long-term benefits for the beneficiaries.

Box 5.2: Strategies for gully treatment method

Strategies for a new gully treatment method

GTZ IFSP-SG believes that effective and large-scale gully rehabilitation can only be achieved through a farmer-driven approach. Hence, GTZ IFSP-SG has applied strategies for the year 2003 according to the following conditions:

- *The technical requirements should be within the scope of farmers' skills and abilities. External support and/or inputs to be eliminated. Materials required should be locally available.*
- *Immediate and long-term benefits to be provided to the farmers.*
- *By an initial period of assistance, farmers to be prepared to further improve and manage the gully on their own.*
- *The owners of rehabilitated gullies to be encouraged to become mentors to new "gully farmers".*
- *"Cut and carry" system to be put forward as a norm.*

Source: GTZ, 2004

One of the big challenges to conservation programs of the 1970s and 80s was that the technical requirements were not in the scope of farmers' skills and abilities (Alemneh, 2003). The gully rehabilitation program by GTZ IFSP-SG seems to be informed of these challenges and hence aimed at incorporating locally available materials and mechanisms (see fig 5.4). Fast return biological measures are also aimed at providing immediate benefits to the farmers with an ultimate objective of paving the way to the realization of long term goals of the program. This has successfully been practiced in the case of Kanat.

Fig 5.4 Physical Structures built from local materials for gully rehabilitation

One important point to be noted with regard to the approach is that GTZ focused on an initial period of assistance, where farmers are to be prepared to further improve and

manage the gully on their own (see Box 5.2). Therefore, basically the approach is a kind of empowering the local people to involve in their own issue. The self-driven measure taken by Kanat community (see sub-section 6.3) to expand the intervention to the adjacent site and to keep the treated site from damage according to the provision of the by-laws (see Box 6.1) is one of the indicators that the local people are somewhat empowered.

It is discussed above that overstocking is one of the major reasons behind heavy land degradation in the study sites as it also holds true for the ANRS in general (see Table 5.1 above). The final bullet point in Box 5.2 above which reads as *"Cut and carry system to be put forward as a norm"* is meant to reverse this problem. In the case of Kanat, this has successful been practiced (but not in Magera).

ii) Nursery Establishment

The biological approach is based on the utilisation of different planting materials, which are raised, tested, and multiplied in GTZ's nurseries (see Fig 5.5). In the case of Kanat, nursery was established temporarily within the micro-watershed itself and species were tested there. This was aimed at facilitating mass production of seedlings, reducing wastage of seedlings during transportation, production of healthy seedlings that can easily adapt the area, and transplanting the seedlings without any long process hardening.

Fig 5.5: Nursery established for multiplication different tree and grass species

C) Introduction of Multi-purpose Fodder Trees, Shrubs, and Grass Species.

Regarding the biological conservation, both introductions of new multi-purpose fodder trees, grasses, shrubs, and leguminous plants and enhancement of the local tree species were practiced in both sites. According to Ato Ayalew Beza, an agronomist in GTZ IFSP-

SG at Debre Tabor, careful observation of the performance (bio-mass formation) of all species was done at project nurseries before disseminating them. The under listed are those tree, grass, and legumes introduced/enhanced in both micro-watersheds:

- Introduced tree species: Tagasaste/tree lucerne (*chamaecytisus palmensis*), teline (*teline canariensis*), susbania (*sesbania sesban*), weeping wattle/Port Jackson willow (*acacia saligna)*, green wattle (*acacia decurrens)*, *acacia abysynica*, Grey poplar (p*opulus canescens*), willow, *hagenia abysynica*,
- Grass species: Bana grass (*pennisetum purpureum*), green gold (*pennisetum sp*), vetiver grass (*vetiveria zinzanioides*), elephant grass *(pennisetum purpureum)*, reed, kikuyu grass (*pennisetum clandestinum*), tall fescue (*festuca arundinaceae*), Phalaris *(phalaris aquatica)*, wild oats
- Creeping legumes: Crown vetch *(coronilla varia)*, common vetch
- Crop: triticale
- Enhanced indigenous trees: Bermuda grass (*cynodon dactylon*), cyperuss spp.

Ato Ayalew also added that fast growing trees and shrubs like susbania, and poplus were first introduced so that the beneficiaries could observe their fast bio-mass return and hence accept easily. In other words, GTZ employed a habit of introducing technologies that convince beneficiaries with their fast return and also out of which beneficiaries can draw immediate benefits. According to most of the respondents and key informants in Kanat, continuous advisory services were also given by GTZ to the farmers on how to use and care the tree and grass species.

D) Watering Points Development

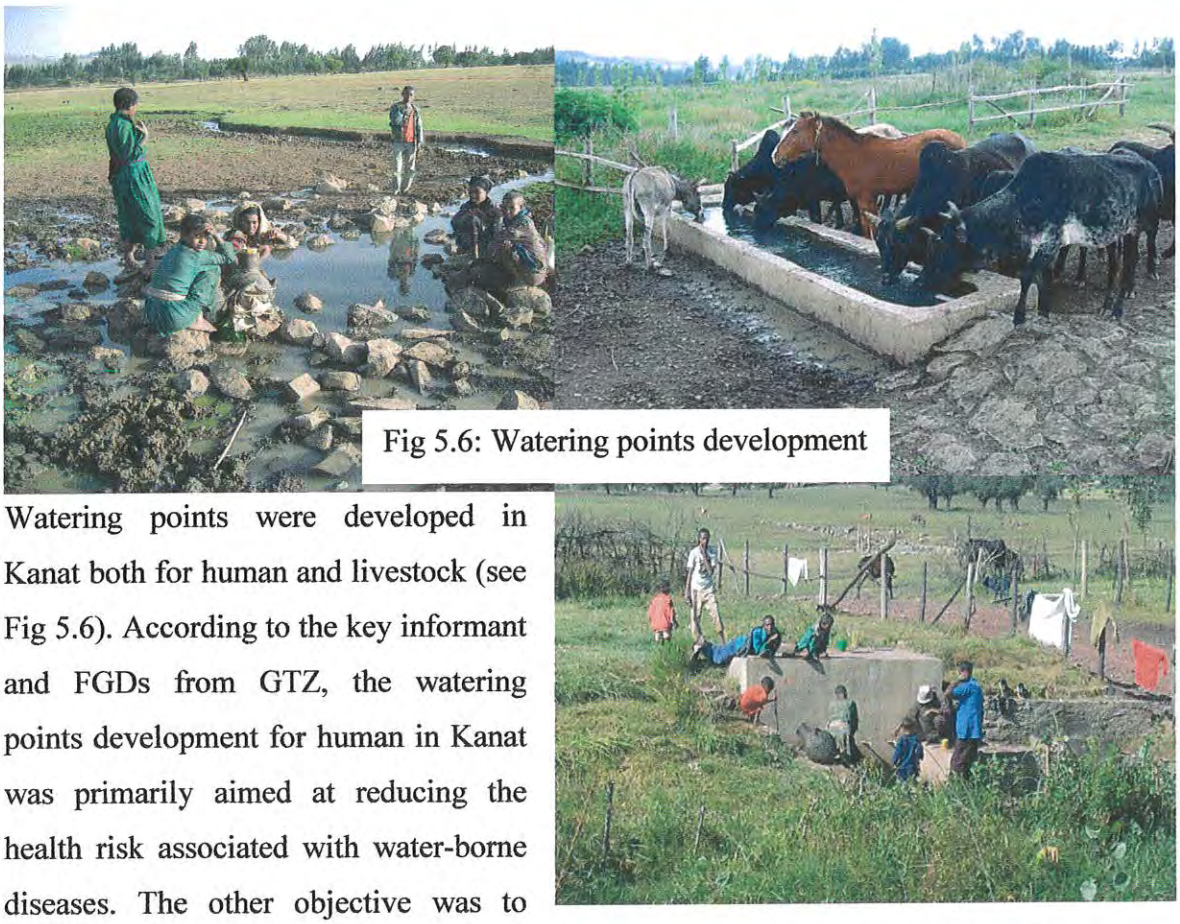


Fig 5.6: Watering points development

Watering points were developed in Kanat both for human and livestock (see Fig 5.6). According to the key informant and FGDs from GTZ, the watering points development for human in Kanat was primarily aimed at reducing the health risk associated with water-borne diseases. The other objective was to avoid the challenge of traveling long distance for fetching water and all the concomitant drawbacks. On the other hand, the side-by-side development of livestock watering point combined with the introduction of multi-purpose fodder trees was aimed at improving the productivity of cattle. It is worth mentioning here that having lessons from previous failure and success stories, in the case of Kanat, GTZ has attempted to incorporate some important livelihood concerns of the target beneficiaries in the whole process of the watershed management program. Ato Simachew Fetene, a key informant from SGAZ and Ato Olana Sifen from GTZ have argued in line with this argument.

E) Introduction of *Tenkara Kend* Improved Plough

Fig 5.7: *Tenkara Kend* plough

According to GTZ (2004), one of the major limiting factors to increased crop production in the Ethiopian Highlands was the widespread existence of a plough-pan, or compacted soil layer, in cultivated fields. Given this problem, *Tenkara Kend* plough (see Fig 5.7) was introduced with the envisaged benefits of increased water infiltration into the deeper layers of the soil; and improved soil-moisture holding capacity leading to decreased runoff, a reduction in water logging, and reduced levels of soil-borne and fungal diseases in crops; and oxygenation of the subsoil leading to increased microbial activity in the soil and an increase in the availability of soil nutrients. It was noted from the discussions held with key informants and FGDs that the plough was widely accepted in the beneficiary communities for the its aforementioned advantages over the traditional plough.

F) Capacity Building

Trainings and experience sharing visits aimed at building the capacity of both the community and the development agents for a sustainable management and development of the micro-watersheds were undertaken repeatedly throughout the program implementation in Kanat. The trainings included both practical and theoretical sessions. Some representatives of beneficiaries have also visited different previously visited sites before the actual treatment begins to take place. However, according to the survey respondents, in the case of Magera, no any such organized capacity building measures were undertaken.

G) Others

Access roads and foot paths were constructed in both micro-watersheds to make the implementation and follow-up of the program easier and create easier access to the resources in the micro-watersheds besides tackling the problem of shortage of feeder roots in the community. In the case of Magera, alley cropping was introduced in some farms in the upper catchments of the micro-watershed. The purpose of alley cropping was to check the aggravating effect of soil erosion by water and gully formation in the upstream on the wellbeing of the communal area in the downstream.

5.4 Challenges Faced during Planning and Implementation and Measures Taken

According to the focus group discussants from Kanat beneficiaries, GTZ, and government staff, the big challenge to implementers during the very first steps of planning was to get farmers' acceptance of the whole idea of intervention. It was said that significantly large number of the community members were resistant to the program when the idea first came. Several mechanisms were employed to counteract this resistance, namely organizing awareness raising meetings, organizing visits to other treated sites, and using fast growing trees and shrubs. Moreover, GTZ in consultation with the beneficiaries introduced an idea of fattening cows during the first year of intervention (see Fig 5.8). Each beneficiary brings one ox/cow every day and ties it in the treated site from 3-5:30pm. Ten people are assigned from the beneficiaries every day to cut grass and feed the cattle. The strategy enabled to fatten 240 cow/oxen hence served as a means to better income in that

Fig 5.8: Fattening oxen/cows

particular year. During the same year, triticale was sown on the communal land and 24 quintals was harvested and sold for ETB 4700. The money was equally distributed to the beneficiaries. Both the fattening and triticale production used as an incentive to the farmers and a compensation for their temporary lack of access to the grazing land (due to closure during treatment) on which their cattle had freely been grazing.

The focus group discussants elaborated that during the national election 2005 of the Ethiopian Federal Democratic Republic Government, the resistance by the beneficiaries reappeared. While trying to take their own advantage, certain opposition party candidates both from Kanat and Magera have disturbed the intervention by mobilizing the community against the KA administration by saying *'the chairperson is going to sell your land to ferenj* [ferenji refers to the then white GTZ IFSP-SG co-coordinator at Debre Tabor] *and you will not get it back'*. These people were boldly claiming that they will 'restore' the land to the community if they were to be elected. The community then fired GTZ out. It was noted that this was a point where the GTZ staff, KA administration, and the temporary WSC has almost lost all the hope.

In an attempt to tackle this problem, the KA administration organized repeated meetings to the whole community in the presence of elders. During these meetings, serious discussions were held and the community was convinced again. The KA administration then called GTZ back and the intervention started to be run smoothly as it had been before. The contribution of the respective KA administrations to success and failure of the interventions will be discussed in detail in the sub-section 6.4.

5.2.5 Major Stakeholders Involved

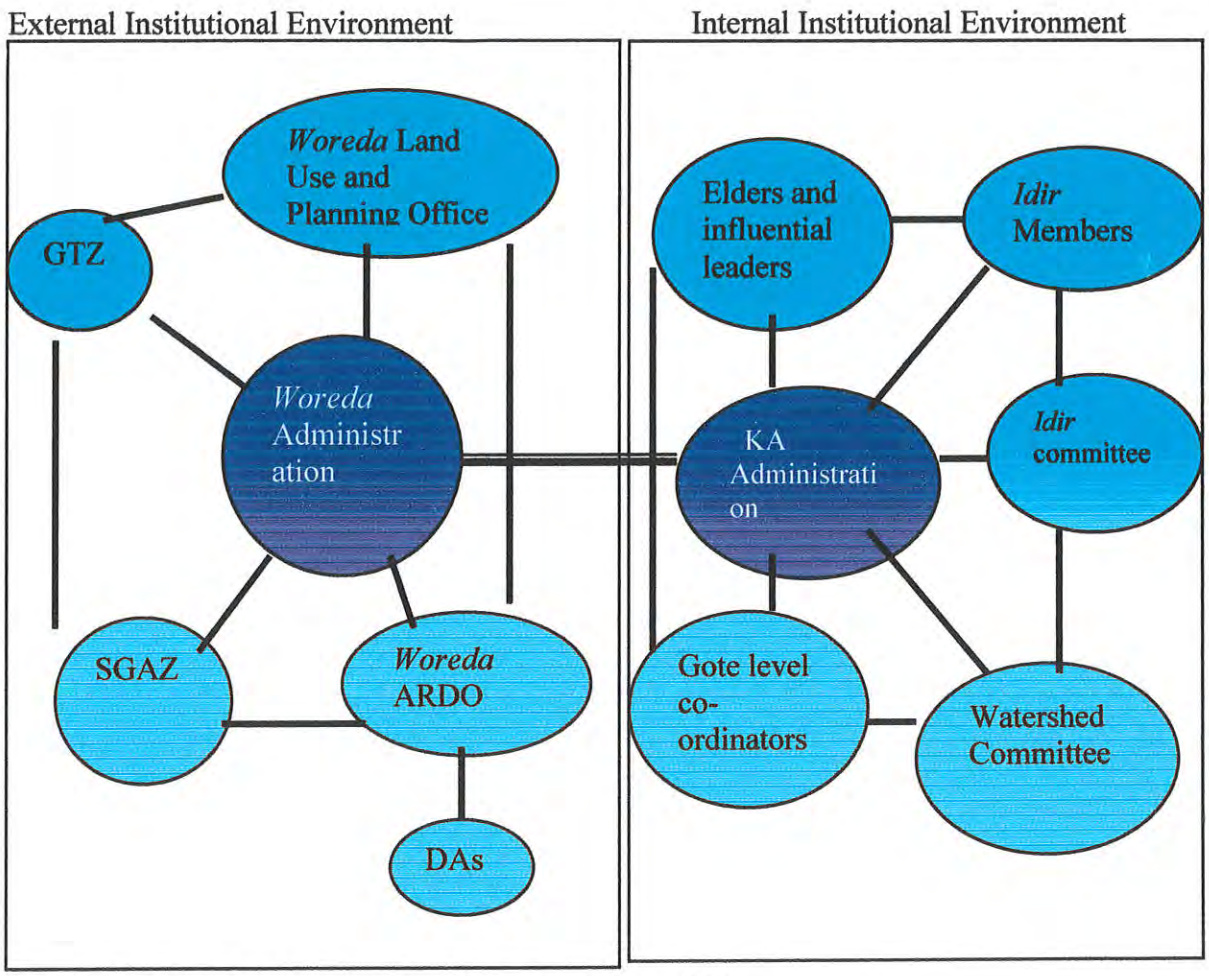
Active participation of all stakeholders in integrated manner (as opposed to fragmented efforts); presence of supportive upper level/external[9] institutions; and clear linkage among and within the local (internal) and upper level (external) stakeholders are some of the

[9] external refers to those upper level formal supporting institutions which are outside the community while internal refers to those actors from the community itself.

factors that serve both as means and end to a successful watershed management. The way the different stakeholders interact with each other and their level of participation has a big implication on the success/failure of a watershed management program. One of the challenges for a watershed governance is also to get a portfolio of relevant actors work together more effectively (Genskow and Born, 2006).

Twelve different major actors are observed to have had different but integrated roles in the integrated watershed management (IWSM) in Kanat (see Fig 5.9). Six of them are internal/within the community while the rest six are external. The internal ones include: *Idir* members/beneficiaries, *Idir* committee, watershed committee, *gote*-level watershed co-coordinators (GLCO), elders and influential leaders, and KA Administration. The external ones are GTZ, Farta *Woreda* Agriculture and Rural Development Office (FWARDO), DAs, Farta *woreda* Administration Office (FWAO), Farta *Woreda* Land Use and Planning Office (FWLUPO), and South Gondar Zonal Administration Office (SGAZO). The local by-laws formulated by the community (see Box 6.1 and Appendix E) also clearly presented a clear link for cooperation among the different stakeholders (especially the internal ones). Both in the internal and external institutional environment, every actor is closely linked at least to one other actor in a cooperative manner. Here below is a figure showing the chain of linkage/cooperation among the different actors.

Fig 5.9: Chain of linkage/cooperation among different actors in Kanat watershed intervention



Source: developed by the author based on primary data, 2009

In the case of Magera, however, only three actors, namely, GTZ, FWARDO, and some farmers from the community were known to involve during the intervention.

a) What a Unique Role is there for each Actor in Kanat?

I. KA Administration

The presence of appropriate and committed local leadership is one of the determinants of a sucessful watershed management. According to almost all sources of primary data for this study, the role played by the KA administration has been instrumental to the integration of

all other stakeholders' roles in Kanat IWSM (see Tables 6.1, Table 6.3, and box 6.1). The KA administration began its role prior to the actual investment in field by inspiring the community with the idea of intervention and taking self-initiated commitment to visit other treated sites to have lessons. The genesis and evolution of the whole idea of intervention, therefore is highly influenced by the KA Administration. As it can clearly be seen from the above diagram (fig 5.9) that in the internal institutional environment, the WSC, the *Idir* committee, and the *Idir* itself work in co-operation with the KA administration. The major roles played by the KA Administration are:

- Awareness raising among the community before, during, and after intervention
- ensuring the enforcement of the by-laws in cooperation with other internal actors
- Bridging between external and internal actors
- Mediating conflicts (see Table 6.1)

II. Watershed Committee (WSC)

WSC here refers to a three members permanent *(not the temporary committee that was established during the onset of the intervention)* committee in Kanat established by the beneficiaries themselves during the handing over of the site by GTZ to the community in December, 2007 (see Box 6.1). The committee works in cooperation with the KA Administration. The major roles of the committee include:

- Reporting any cases of miss utilization or theft to the *Idir* committee
- Enforcing the by-laws in alliance with the *Idir* Committee.
- Managing and facilitating just and equitable distribution of benefit from the communal land.
- Mobilizing members for action e.g. for maintenance and harvesting grass
- Directing the village level-coordinators

III. The *Idir* /beneficiaries

Almneh (2003) recommended that government should make a concerted effort to support and strengthen indigenous community organizations/traditional institutions as they have the

potential to be an important vehicle for facilitating community based approaches in natural resource management and self-help development activities. All the 230 beneficiaries in Kanat belong to the same *Idir* which serves several social roles. All members participated actively to cover 30% of the project cost through provision of free labor and local materials. As testified by most key informants from the community, GTZ, and the Government staff, the success of the intervention in Kanat has a lot to do with the active involvement of *Idir*. *Idir* works closely and in cooperation with KA administration, especially in enforcing the by-laws and effecting sanctioning as per the provision of the by-laws. One more important role of *Idir* is also that it serves as a medium for any other internal actor, for instance WSC, to share any new ideas or even grievances; and also to mobilize members for action.

IV. The *Idir* Committee

Idir committee, assigned by the *Idir,* is an already existing committee with a mandate of handling several social roles in the community as it holds for all other rural and urban communities in the country. It assumed a role in watershed management because it was identified and involved as a major stakeholder in the intervention starting from the planning phase. The major task of *Idir* committee in watershed management in Kanat is ensuring sanctioning as stated in the by-laws in cooperation with the *KA* administration and the watershed committee. The committee is also responsible for reporting the case to the *Idir* whenever a person who breaks the by-laws is not willing to accept the charge according to the provision of the by-laws.

V. Elders and Influential leaders

Information from FGDs and key informant interviews revealed that elders and influential leaders play three important roles in IWSM in Kanat. The first and the most important role is arbitrating conflicts. The second instrumental role of elders is that they support WSC in mobilizing the community for action. Moreover, elders support the watershed committee in enforcing the by-laws.

VI. *Gote* Level Coordinators (GLCO)

The two important functions of GLCO are: assigning members every day from their gote to keep the treated communal area from damage and informing members of their respective gotes for action whenever the WSC or *Idir* members pass a certain message. GLCO performs all this in collaboration with the WSC, the *Idir* committee, and the KA Administration..

VII. GTZ

The major roles played by GTZ in the whole process of intervention as pointed out by the respondents, FGDs, and the Key Informants include:

- Coverage of 70% of the total watershed intervention cost.
- Technical and advisory service in the area of agronomy and natural resources management
- Continuous follow-up of the treated sites until their handover to the community.
- Organizing awareness raising meetings among the beneficiaries before, during and after treatment; and support in institution-building
- Organizing experience sharing visits for beneficiaries and government staff.
- Resolving conflicts

VIII. Government Offices

Government offices here stands for FWARDO, FWAO, FWLUPO, and SGAZO. According to most of the respondents and the key informants from farmers, government offices have played key role in creating enabling environment and conflict resolution. The [illegible] government staff in conflict resolution will be discussed [illegible]

roles played by the government staff in conflict resolution will be discussed in sub-section 6.4.

5.6 Bio-physical Condition of the Micro-watersheds after Treatment

According to the survey respondents and the FGDs in Kanat, these days the magnitude of land degradation has at large been cut short by the watershed treatment. As it can be observed from Fig 5.10, the intervention has brought some observable positive changes in the bio-physical condition of the micro-watershed. In the case of Magera, however, land degradation stands out to be serious problem; getting a higher and higher momentum year after year. Though the intervention has brought some physical cure initially, the situation reappeared with in the short period of time after GTZ left the site (see Fig 5.11). The personal observation of the researcher has also testified this fact.

The following pictures (Fig 5.10 and Fig 5.11) indicate the bio-physical condition of part of Kanat and Magera before and after the watershed intervention.

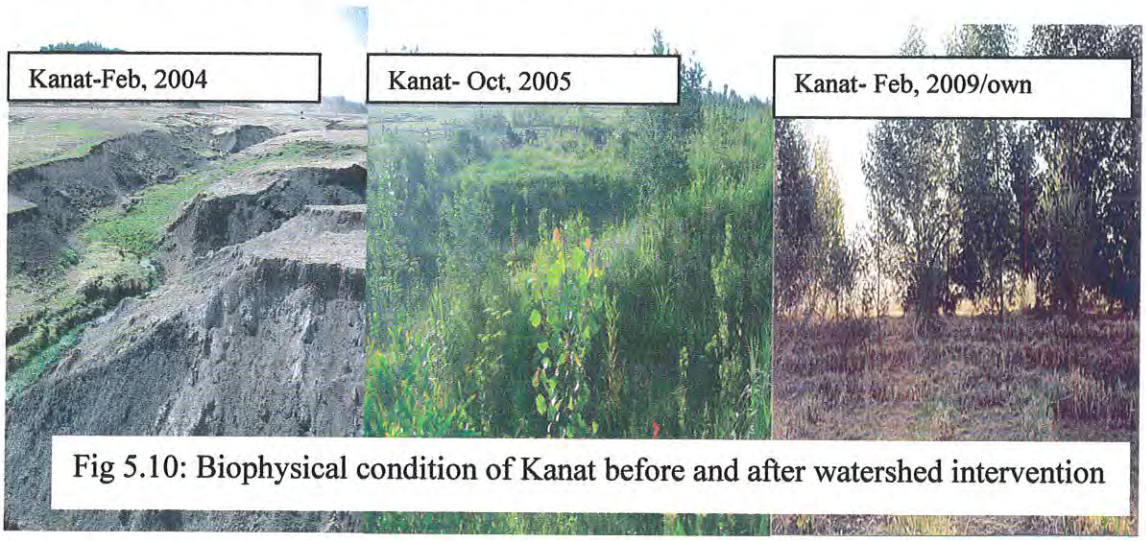


Fig 5.10: Biophysical condition of Kanat before and after watershed intervention

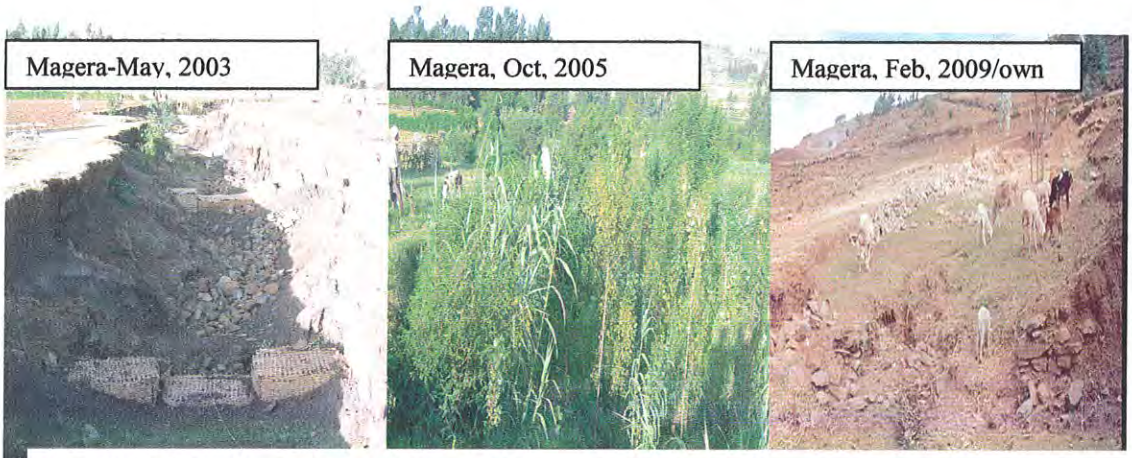


Fig 5.11: Biophysical condition of Magera before and after watershed intervention

5.2.7 Benefits Accrued by the Community from the Intervention in Kanat

The immediate objective of the watershed management program of both sites was rehabilitating the degraded lands with an ultimate goal of pulling the beneficiaries out of the vicious circle of food insecurity and environmental degradation. Besides successful rehabilitation of the degraded land, the program created access to watering points (both human and livestock), feeder roots, and foot paths in Kanat. The treatment has also 100% checked the devastation of downstream residence, infrastructure, water points, and farm land by heavy flood that originates in the upstream (the now treated area). Moreover, triticale crop, which was first introduced for the purpose of treatment of the micro-watershed, has now become popular high yielding crop in the whole *kebele* (This also holds true for Magera) and other adjacent *kebeles*. Having experience, from the treatment of the communal area, some of the survey respondents told the researcher that they are practicing the bio-physical methods of soil and water conservation mechanisms in their own farm.

CHAPTER SIX
INSTITUTIONAL ARRANGEMENTS AND REASONS BEHIND SUCCESS AND FAILURE

Devoted to look in to the established systems for the overall management of the micro-watersheds after the introduction of the watershed intervention, this chapter sheds some light on two important themes of this research project. The first section dwells in looking in to the established institutional arrangements in place. Three important issues, namely, by-laws, graduated sanctions, and conflict resolution are discussed under this sub-section. Based on all primary sources of data for the study, the second section scrutinizes the very reasons behind success and failure of the respective watershed interventions.

6.1. By-laws

The presence of locally evolved, simple, clear, enforceable, and well articulated rules/by-laws for the management of a watershed is one of the indicators of a successful watershed management. In the case of Kanat, there is a formal document (see Box 6.1 and Annex 5) the first two pages of which present the by-laws established by the community during the handover process of the site by GTZ to the community (no any such by-laws in Magera). The rest pages of the document consist the name list and signature of the members as a conformation to the agreement to obey the by-laws. These by-laws clearly indicate the rights and the responsibilities of the community, the *KA* administration, the WSC, *Idir* committee, and *GLCO*. Included in the by-laws are also well articulated sanctioning mechanisms.

According to most of the key informants, establishment of the by-laws in Kanat was initiated by the KA administration. Initiation, here, is to mean facilitating the overall process of the formulation; otherwise it is not to say that the by-laws are articulated by the KA administration. As to the process of development of the by-laws, Ato Markos Habtu put it in the following way:

During the handover of the site, the Kebele administration asked the community whether they were willing to establish by-laws or not. All the beneficiaries agreed that establishing by-laws will help them to manage the site sustainably. All the regulations that should be included in the by-laws are proposed and discussed in detail. Among these, those which are agreed up on by the majority are written on paper in organized manner. Finally all the beneficiaries signed as a conformation to their agreement.

Here below are the by-laws translated in to English from Amharic.

Box 6.1: Local by-laws in Kanat watershed management

***Date**: 05/04/99 E.C (14/12/07 G.C)*
***Venue**: Kanat*
***Participants:** Kanat micro-watershed beneficiaries*
***Purpose of the meeting**: the purpose of the meeting is to establish by-laws that enable us to use, protect, care, and develop the micro-watershed treated and handed over by GTZ to us today.*
Bylaws:
1) We all the beneficiaries of the micro-watershed will care and maintain all the biological and physical soil conservation structures in the micro-watershed. We will also further develop the micro-watershed based on the advisory services we get from experts and we will also share equally all the benefits from the micro-watershed.
2) We will also protect the grass and the tree species from free grazing. Each of us will keep (guard) the site turn by turn [being appointed by the watershed committee].
3) We have elected a watershed committee because we are convinced to do so. The committee is responsible to ensure that the rehabilitated micro-watershed is kept undamaged, make a follow up, and punish (in collaboration with the *Idir* committee) *those who break the bylaws.*
3.1. The List of watershed committee members:
1) Ato Birara Engida
2) Ato Woreta Darcha
3) Ato Belachew Molla
4. Conditions that lead to punishment and the types of punishments
4.1. If an assigned member (for that given day) to keep the site fails to do so, he/she will be charged ETB 30.
4.2. If the assigned member lets his/her own cattle feed in the communal area, he/she will be charged ETB 3 per cattle.
4.3. If the assigned member to keep the site is punished more than three times he/she will be excluded from sharing the benefit and also from membership in Idir.
5. Duration of time for keeping (guarding) the site for the assigned members will be from 7am in the morning to 6 pm dawn.
5.1. Any body that lets his/her cattle to the communal area before 2 am in the morning and after 6 pm dawn will be punished ETB 30.
5.1. If he/she repeats the type of fault mentioned in sub-article 5.2 once more, he/she will be excluded from membership for good.
5.3. If a member refuses to obey the assigned members and lets his/her cattle graze in the communal land forcefully, he/she will be charged ETB 10/ per cattle?.
5.4. Four members will be assigned to keep the site for a day. When they found any body breaking the by-laws, one will accuse while the rest three will be witnesses.

6. The under listed four people are exempted from being assigned to keep the site and they are given a responsibility to assign others for the task. [These people are assigned from each gote so that each will assign one person from the gote for a day].
1. Ato Feleke Wondimagegne
2. Ato Tegaw Kasse
3. Ato Mersha Yigzaw
4. Ato Wondim Aseffa
7. GTZ will repair the water points in the micro-watershed and then we will use it in a sustainable manner by repairing it.

8. The Role of KA Administration
8.1. Strengthening the watershed committee and ensuring that it is discharging its responsibility properly.
8.2. Making a weekly meeting to evaluate the situation of watersheds and propose a possible solution for problems at hand.
8.3. Watching the watershed committee and facilitating punishment [of the committee members themselves] *according to the provision of these by-laws when they are found to break the by-laws*
8.4. Making a follow up and excluding the committee members from membership if they break the by-laws more than three times
The provision of these by-laws shall also apply to all the committee members the same way it does for all ordinary members.

According to most of the respondents, the by-laws are carefully enforced and even that there are some recently added rules, which were not included in the original by-laws. For instance, recently the community reached on a consensus that any visitor who comes to visit the site will be charged ETB 1 per head.

6.2. Sanctioning Mechanisms

One of the facilitating conditions for effective governance of CPRs is the presence of graduated sanctions (Wade, 1988; Ostrom, 1990; Agrawal, 2002; Baland and Platteau, 1996). Given the above-stated by-laws in Kanat, when any community member or the assigned persons found somebody breaking the by-laws, they immediately report the case to the watershed committee. The watershed committee then reports to the *Idir* committee thereafter which both committees execute the punishment process according to the provision of the by-laws. If the person refuses to accept the punishment, the *Idir* committee reports to the *Idir* where after which the person has only two choices- exclusion from *Idir* membership or accept the charge and pay the money immediately. According to Ato

Markos Habtu, *KA* chairperson and a key informant from Kanat, there is a general consensus among the community that there is a possibility for a case to become a court case eventually if a person is not willing to accept the charge in any of the above stages. However, according to the FGDs, exclusion and court cases has not yet been practiced to date.

6.3. Conflict: Causes and Ways of Handling

6.3.1. Source of conflict

Conflicts are common features where there is a certain group, which, is bound by a common rights to and responsibilities for a given resource. The presence of appropriate conflict resolution mechanisms is, therefore, one the most important conditions for an effective management of the resource and the wellbeing of the resource users. Respondents from both micro-watersheds said that they haven't witnessed serious internal conflicts within the micro-watersheds except some slight disagreements among the beneficiaries. In the case of Kanat, there has surfaced strong conflict with the neighboring KA (Wowana Magera) residents over the resources in the treated area. The conflict surfaced in 2008 when beneficiaries of Kanat have started to extend the intervention in to other parts of the grazing land by themselves. Some of the bio-physical structures are damaged during the conflict. A key informant from Kanat, put the reason behind the conflict as follows:

> *...some people from the neighboring KA were used to use the grazing land together with us before the watershed intervention. But during treatment these people didn't participate because they were not willing to do so. But after treatment, when they see all the benefits we get from the program, they raised a question that they have equal right to share the benefits with us. This is the source of the conflict*

But according to Selamawit Bekele, Land Use and Administration Expert of Debre Tabor Town Office of Agriculture (DTTOA), the conflict was not spontaneous and the reason behind is also beyond and more than the issue of immediate benefit sharing. Tracing back to the first serious conflict 20 years from now, she elaborated the underlying source of the conflict as follows:

> ..... *Before the watershed intervention, the grazing land had been used by some people from both KAs. But conflict between the two adjacent Kebeles was common even during the Derg* [the former military government of Ethiopia] *regime. The major source of conflict was not only an issue of immediate benefits sharing from the communal land but on the ownership of the land per se. Both kebeles have been claiming that the land belongs to them and the big challenge to the concerned government bodies was to decide and allocate the land to either. In 1991 (immediately after the downfall of Derg) it was decided that the land should belong to Kanat kebele and its boundary was clearly delimited. The conflict reappeared once again in 1992. After some process of revisiting the case, this time also the land was decided to belong to Kanat. The recent conflict, though it seems to be only on benefits from the grazing land, the reality on the ground and the historical evidences show that the source of conflict is not on the immediate benefit; but on the ownership of the land itself.*

It is understood from the above discussions that the underlying cause of the conflict is more of the issue of property rights than immediate benefit sharing. Though there is clearly defined number of users and the boundary of the grazing land itself, that the delineation of the boundary accorded primacy to the administrative boundary to the neglect of the locally experienced one.

6.3.2. Conflict Resolution

A joint force of FWARDO, FWAO, SGAZO, KA administrations (of both k*ebeles*), elders, and influential leaders have played important role in mediating and resolving the conflict (see table 6.1).

Table 6.1: Major role players in conflict resolution in Kanat

Who Played the major role in conflict resolution?		**Responses (N=46)**	**Percent of Cases**
1	Elders	35	76.1%
2	KA administration	38	82.6%
3	Watershed committee	30	65.2%
4	GTZ	34	73.9%
5	*Woreda* administration	31	67.4%
6	Zonal administration	21	45.7%
7	Relatives from both sides	25	54.3%

Source: Own household survey, 2009

Following the serious conflict surfaced in 2008, both KAs reported the case to their respective *Woreda*. A key informant from Kanat elaborated the situation during the time as follows:

> *...the conflict was very serious. So many people from Wowana Magera (the neighboring Kebele), came with their large flocks of cattle and let their cattle to the extended intervention site* [additional area treated later on by the community itself] *in the communal land where we invested a lot. The conflict then starts to grow more and more serious. But in the mean time FWAO sent a police force to our Kbele. The police took very harsh measures and jailed some of us without properly investigating in to the root causes of the conflict.*

The conflict grew stronger and stronger and in the mean time it was known that the issue is beyond the capacity of FWAO. The administrator of the SGAZ has intervened in the process and decided the grazing land to be freely grazed by cattle of both communities. His decision was based on wrong information given to him by FWAO. Almost all the stakeholders consulted for data for this study by the researcher said that the decision was *"wrong and uninformed"*. This decision didn't brought lasting solution as the conflict started to grow more and more serious.

After observing that the decision of the administrator didn't bring viable solution, a one day workshop involving all stakeholders was facilitated by GTZ and held in Debre Tabor town. Fortunate enough, the researcher had also a chance to participate in the workshop.

Speaking in the workshop, the administrator of SGAZ, Ato Muluselam Hawaz himself asked excuse for his wrong decision and said: *"The decision I passed was wrong. I shouldn't have decided the grazing land to be freely grazed in the form of open access".*

During the workshop, a task force was established from zonal administration and *woreda* Land Use and Administration Offices. Assignments were given to elders and KA administrations of both Magera and Kanat to identify people from Magera who are around the border of the range land and who had been using the grazing land before intervention together with beneficiaries in Kanat. Currently, the task force has successfully accomplished its assignment and the proper users were identified based on the consensus of both community.

Two of the design principles for effective governance of CPRs by Ostrom (1990) and also other CPRs scholars are having clearly defined boundaries of the resource and the resource users *per se*. Here it is important to note that beneficiary selection based on the administrative boundaries only may lead to life-threatening conflicts and the failure of the conservation program itself. Therefore, the wisest delineation of boundary of resource users is the one that considers the local experiences and resource use pattern. Moreover, the commitment of the different actors to go through the long process of resolving the conflict and seeking for alternative solutions is important when such conflicts happen to appear.

6.4. Success and Failure: What Forces are behind?

Successful watershed management and (and also of CPRs) is a function of a range of bio-physical, socio-economic, and institutional factors. It goes without saying that the whole approach of intervention is one of the key determinants to success. The presence of committed local leadership and supportive upper level institutions, conducive policy environment, and appropriate incentive mechanisms is the way to success. A couple of paragraphs below present the very reasons behind success and failure of the respective watershed management programs in light of this range of factors.

Table 6.2: The assessment of the performance of watershed interventions

How do you appraise the performance of the watershed intervention in Kanat/Magera?		Kanat (N=46)		Magera (N=50)	
		Responses	**% of cases**	**Responses**	**% of cases**
	Successful	38	82.6	-	-
	Satisfactory	7	15.2	-	-
3	Failure	-	-	48	96
4	Missing	1	2.2	2	4
Total		46	100.0	50	100.0

Source: own household survey, 2009

Most of the survey respondents (see Table 6.2) and the focus group discussants have rated the performance of Kanat watershed intervention as successful. In the case of Magera, however almost all the respondents have rated the performance of the intervention to be a complete failure.

According to the survey respondents and FGDs, a synergy of active role of the KA administration, high commitment and participation of the beneficiaries, strong commitment of a donor agency (GTZ), strong participation of *Idir* as a dominant traditional institution, and excellent commitment and coordinating skill of the WSC are the most important factors responsible for the success of the watershed intervention in Kanat (see Table 6.3).

Table 6.3: Major factors that have contributed to the success of the watershed intervention in Kanat

	...what are the major factors that have contributed to the success of the intervention?	**Responses (N=46)**	**% of Cases**
1	Commitment of KA administration	39	84.8
2	Active participation of the beneficiaries	41	89.1
3	Active facilitating role of government staff	18	39.1
4	Strong support and participation of GTZ	41	89.1
5	Excellent commitment and coordinating skill of WSC	37	80.4
6	Strong participation of *Idir*	40	86.9

Source: own household survey, 2009

On the other hand, regarding Magera watershed intervention, weakness of KA administration, lack of follow-up by the concerned government bodies, and lack of by-laws are the most important reasons behind failure (see Table 6.4). In addition, GTZ's failure to consult the whole community before the intervention was also mentioned to be the one equally important to the above reasons. Surprisingly these explanations were shared by all the interviewed stakeholders including GTZ staff itself.

Table 6.4: Major factors that contributed to the failure of the watershed intervention in Magera.

	...what are the major factors that have contributed to the failure of the intervention?	Responses (N=50)	% of Cases
1	Weakness of KA administration	42	84.0
2	Lack of follow-up by the concerned government bodies	39	78.0
3	Lack of by-laws	40	80.0
4	GTZ's failure to consult the whole community before intervention	39	78.0

Source: own household survey, 2009

6.4.1 The Strength and Commitment of KA Administration

As indicated in Box 2.1, local authorities are important figures that play typical role in effective CPRs management. The persistent commitment of KA administration starting from the very beginning to post-intervention handling of the treated site is one of the most important factors that have contributed to the success of the watershed intervention in Kanat (see Table 6.3). FGDs from GTZ and DTTOA have also given testimony that the strength of the KA administration especially that of the KA chairperson has contributed a lot to the success of the intervention. One of the most important contributions of the KA chairperson is creating awareness among the community as mentioned in sub-section 5.2.5. The strong local institutional basis is also the fruit of the commitment of the KA administration and GTZ to create an aware and committed community before starting the actual intervention. Ato Simachem Fetene, a Planning Expert of South Gondar ARDO, has also argued the same way the FGDs pinpointed.

As opposed to that of Kanat, in the case of Magera, however, the weakness of the KA administration in general and that of the KA chairperson are said to contribute a lot to the failure of the intervention. Ato Gobeze Asmamaw, a DA in Magera KA and a key informant, substantiated that the then KA chairperson and the KA administration in general were very weak and it seems that they had no any concept about the negative consequences of degradation of natural resources on the wellbeing of the community. FGDs of experts from DTTOA, FWARDO, GTZ staff and a key informant from Zonal ARDO have all argued in line with Ato Gobeze's argument.

6.4.2 The planning Process and Participation of the Potential Beneficiaries

According to Achouri (2005), one of the major reasons behind failure of most of the watershed management programs in Africa is ignorance of the beneficiaries' involvement and contribution to the planning and implementation of watershed management interventions. It goes without saying that it is difficult, if not impossible, to create a sense of ownership among a community which doesn't participate in intervention of such type.

Moreover, it will be a recipe for loss if implementers of such project rush forward without making sure that there is mutual consent among the watershed community on benefit and cost sharing. It was noted from the discussions with different stakeholders that in the beginning, there was very strong resistance against the whole idea of intervention by a large number of beneficiaries in Kanat (see the detail in sub-Section 5.2.4).

Two important questions to be asked in relation to active participation of beneficiaries in Kanat are *'what is the reason behind this active participation?* and *'who contributed to it?'*. All the mentioned reasons behind success (see Table 6.3) are interdependent and reinforcing each other. As it has repeatedly been mentioned elsewhere in this chapter, the commitment of KA administration and GTZ to create awareness among the community was said to be one of the most important reasons behind active participation of the beneficiaries. The long way they traversed to break the resistance of the community against the implementation of the project can be a good reason to say that these bodies were committed to bring about active participation of the beneficiaries.

As opposed to that of Kanat, GTZ's failure to strictly follow participatory approach of planning is emphasized by most of the focused group discussant to be the root cause of failure of the intervention in Magera. The involvement and contribution of the beneficiaries was neglected during the early stage of watershed intervention. This resulted in lack of two important central determinants of a successful watershed management, namely, a sense of ownership and willing participation of the beneficiaries. Though they appreciated the whole idea of intervention brought, most of the respondents and key informants blamed the government bodies and GTZ mainly for the following three reasons:

- Lack of having consultation with the whole community before intervention
- Leaving the site without handing it over properly to the whole targeted beneficiaries after healing the land
- Not facilitating the establishment of by-laws before handing the site over to the community.

Attempting to show that the whole process of intervention followed at Magera was not participatory, Ato Olana Sifen, a key informant and a Soil and Water Conservation Senior Advisor of GTZ-SUN Amhara – Debre Tabor put it as follows:

> *At Magera, unlike Knant, where the community itself has brought the idea of intervention, we (GTZ) ourselves had initiated the whole idea of intervention. No enough awareness creation work was done as it was in Kanat. Rather, the intervention was started in collaboration with the KA administrator and some innovative farmers. The whole steps of planning followed were not participatory. Even the handing over process of the treated site to the community was held where there was no any legal/government body.*

6.4.3 Facilitating Role of Government Staff

The presence of supportive upper level institutions is one of the facilitating conditions for successful governance of CPRs (See Box 2.1). According to most of the survey respondents in Kanat, government bodies have played critical role in creating enabling environment for the implementation of the project and conflict resolution. Here the government staff refers to the concerned professionals from FWAO and FWARDO (including DAs). Unlike this, however, it is recognized that the concerned government staff is the one who can by no means escape the blame for the failure of the watershed intervention in Magera. DAs and FWARDO staff were said to have given no attention even when the community was damaging the biophysical structures introduced into the site. Masresha Ababu, a key informant and the chairperson of a Magera *Kebele,* expressed the failure of government staff to play its role in the following way:

> *... as soon as GTZ left the site all the community let their cattle freely graze in the treated area and intentionally damaged the physical structures by their own hands. Even at this stage the concerned government bodies failed to take corrective measures to halt this devastating act of the community.*

6.4.4 External Support

Appropriate levels of external aid to compensate local users for conservation activities is one of the facilitating conditions for effective governance of CPRs and also for the success of any watershed management intervention. One of the problems with the soil and water conservation programs of the `1970s and 80s was that they focused too much on natural

resources conservation; and they were designed in little attention to human activities and priorities and needs of people (Alemneh, 2003). The unreserved technical and advisory service and timely provision of materials given to the farmers by GTZ are said to be some of the important reasons behind success of the watershed intervention in Kanat.

6.4.5. Level of Beneficiaries' Awareness

According to the FGDs of experts of DTTOA, one of the most important factors that have contributed to the success of Kanat watershed intervention was the continuous awareness creation that was made by GTZ from the outset more than that was done at Magera. According to Simachew Fetene, GTZ has given more attention to Kanat than Magera, which according to him is one of the most important reasons behind success. Ato, Gobeze Asmamaw, a DA in Magera KA and a key informant, in his part elaborated the reason behind the failure of watershed intervention in Magera as follows:

> *Due to the fundamentally low awareness of the community, there was a mismatch of goal of the community and GTZ during the intervention. GTZ was focusing on natural resource conservation (healing the land) but the community was interested in their daily earnings that were offered by GTZ through food for work and cash for work. That is why they didn't care about the sustainability of the intervention after they have collected their cash/food for that work. A Committee was elected in the presence of a few beneficiaries when GTZ left the site. But the committee had no any function since the community itself destroyed all the bio-physical structures the moment GTZ left the site. The hand over process was not also done in the presence of all the beneficiaries. The big challenge to the sustainability of the intervention in general was lack of sense of ownership by the community.*

Tamagnsew Abaselam, a key informant and Natural Resource Conservation and Land Use team leader at FWARDO, in his part, argued the same way Ato Olana did:

> *...Most of the beneficiaries in Magera haven't internalized that the intervention is for their own best, probably because no much awareness creation was done and they were not consulted in advance. That is why the beneficiaries themselves destroyed the bio-physical structures introduced.*

6.4.6 Commitment and Coordinating Skill of WSC

As discussed in sub-section 5.2.5 above, one of the important roles of the WSC in Kanat is enforcing the by-laws in alliance with the *Idir* committee and mobilizing members for action. The commitment of the committee to ensure the enforceability of the by-laws was emphasized by most of the survey respondents to be one of the important reasons behind the trust of the community on the committee. It was also noted from the discussions with the focus group discussants that the committee treats all the members equally.

6.4.7 Established Rules: Appropriation rules, graduated sanctions, and Conflict Resolution Mechanism

Box 6.1 (see also Appendix E) shows that there are clearly established appropriation rules, graduated sanctions, and detailed roles of different stakeholder in Kanat watershed intervention. On the other hand, one of the most important reasons behind failure of the watershed intervention in Magera is that lack of any established rules as to how to appropriate the benefits from the communal area. Masresha Ababu, the chairperson of Magera KA and a key informant in his part put some of the reasons behind the failure of Magera watershed intervention as follows:

> *...during the intervention it is only few members that were participating in the intervention for food for work/cash for work....Another problem was that GTZ didn't give responsibility to any body when it left ('balebet alneberewum' means no clearly defined owner) and there were no any by-laws developed to govern the whole management of the site.*

It is understood from the survey responses and the discussions held with several stakeholders that unlike it did in Kanat, GTZ gave responsibility to nobody when it leaves the treated grazing land in Magera. Regarding the bio-physical structures built in the farmland, it is known from the discussions that enough capacity building work was not done; and also no continuous follow-up and advisory services were given to the beneficiaries as to how to handle the treated gullies. There were no any by-laws built to govern the whole management of the site. The community used this gap to freely let their cattle and break the physical structures the 'moment' GTZ left the site.

It is clear from the above points that there was no any clearly defined boundary of users, which is one of the facilitating conditions for effective governance of CPRs according to (Ostrom, 1990). The point made by Masresha i.e. *'Balebet alneberewum'* (means no clearly defined owner) testifies that the treated site was left as an open access to which every body has access and no body is the owner. FGDs of experts from DTTOA, FWARDO, GTZ staff and a key informant from Zonal ARDO have all argued the same way Masresha did.

CHAPTER SEVEN

CONCLUSIONS AND POLICY IMPLICATIONS

7.1. CONCLUSIONS

This study has generally aimed at determining the socio-economic and institutional dynamics of integrated watershed management in two contrasting micro-watersheds selected from the Blue Nile Basin. Specifically, the study has identified the major stakeholders involved and their respective roles, the differences in institutional arrangements, and the root causes of success and failure of the integrated watershed management in the two selected study sites. A mix of qualitative and quantitative methods is employed to address the stated objectives.

The study results have shown that there are clear differences between the two watershed interventions interms of both the overall implementation approach and the established management systems. Regarding the implementation approach, there is a big difference in the whole process of evolution of the intervention idea and the planning process in the study sites. In the case of Kanat, the source of the intervention idea is the community itself, while in the case of the Magera the idea was imposed by a donor agency, namely GTZ. The planning process followed in Kanat is essentially a kind of iterative, participatory, and empowering where the program targets are highly involved in the process starting from the very beginning unlike that of Magera, which is basically a sort of top-down. Here it is to be noted that the source of the intervention idea and the planning process matters. It would be difficult to create a sense of ownership among a community without involving them in the whole process of intervention starting from the very first step of planning.

One of the most striking differences found between the two watershed management programs is the level of participation of stakeholders. Active participation of all stakeholders in integrated manner (as opposed to fragmented efforts); presence of supportive upper level/external institutions; and clear linkage among and within the local (internal) and upper level (external) stakeholders are some of the factors that serve both as means and end to a successful watershed management.

Given the considerably high initial resistance of Kanat community and their willing participation in the mean time, success of a watershed management program in general and CPRs management in particular has a lot to do with the commitment of donors, local authorities, and government staff to create awareness among the beneficiaries. It goes like that building strong local institutional ground, among other things, primarily depends on the commitment of the upper level institutions and donors to create informed community from the outset. Expecting active participation of beneficiaries while at the same time skipping the very first link for effective watershed intervention viz. awareness creation among the target beneficiaries, will only be a self defeat.

Strong commitment and support by GTZ as a donor agency is one of the critical reasons behind the success of watershed intervention in Kanat. Its cooperative roles in awareness raising, institution-building, conflict resolution, and continuous follow-up have been instrumental. This shows that a non-passive strong donor support is one of the most decisive factors that contribute to successful watershed intervention.

Had it not been due to strong commitment and cooperative action of the KA administration, WSC, and the *GLCO* in the whole process of implementation and establishment of management arrangement, among others, it would have been impossible to come up with a successful watershed intervention in Kanat. On the other hand, weakness and lack of commitment of the KA administration, lack of any WSC and GLCO are some of the reasons behind failure of watershed interventions in Magera. This indicates that the presence of committed and cooperative local leadership is one of the most important factors for a successful watershed management.

Idir as a dominant traditional institution is known to contribute a lot to the success of the watershed intervention in Kanat. Unlike that of Magera where it was not given any chance to involve, *Idir* has played key roles in effecting sanctioning and ensuring the enforceability of the by-laws. It also served as a medium through which the watershed committee and the KA chairperson mobilize the community and share new ideas. This

indicates that traditional rural institutions can assume a big role in IWSM program besides their intended social roles in the community. It also shows that watershed management programs can be successful by taking the advantage of involving the already entrenched traditional institutions in the whole process of intervention than only rushing to create other community organizations. Moreover, elders and influential leaders can play key roles in IWSM if they are identified and involved as one of the stakeholders.

The study results have also shown that there has been a visible difference in the levels of the roles played by the government bodies in the whole process of implementation and establishment of the watershed management arrangements. In the case of Kanat, government bodies have played a critical role in conflict resolution and creating an enabling environment for the implementation of the program. However, in the case of Magera, even some of the blame for the failure of the watershed intervention goes to the local government bodies, especially FWARDO. Hence it is difficult to undertake a successful watershed intervention without committed and continuous support of the respective government bodies in the overall process of the intervention.

It is known that there are clearly defined and easily enforceable by-laws in Kanat that are established by the beneficiaries themselves. On the other hand, there are no any such by-laws in Magera; and this is one of the reasons behind failure of the watershed intervention. It is to be noted that the presence of by-laws and committed local leadership to enforce them contributes to a successful IWSM. Moreover, beneficiaries better conform to the by-laws if they are originated from their own interest than being imposed by upper level institutions or donors.

The study has found that there is no clear boundary of resource users in the case of the communal area in Magera. On the other hand in the case of Kanat, there are clearly defined boundaries of both the resource and the resource users. But the problem is that the definition of the boundaries accorded primacy to the administrative boundary by neglecting local experiences, which finally resulted in serious conflict. Cooperative and combined efforts of elders, KA administration, WSC, *woreda* administration, GTZ, and Zonal

Administration played a big role in resolving the conflict. Delineating boundary of resource users based only on the administrative boundary could lead to serious conflicts that would threaten life and dilute the whole efforts of watershed intervention. The presence of effective conflict resolution mechanisms and active involvement of all stakeholders in conflict resolution are two of the important factors that contribute to success in IWSM.

Generally the study results have shown that interventions that solely focused on healing the degraded watersheds without any concern to institutional architecture and the community's basic concerns would only hardly be successful. Moreover, focusing on implementation of the program without taking commitment to establish appropriate watershed management arrangements in place is a big loss.

7.2. POLICY IMPLICATIONS

Based on the findings of the study, the following policy implications are drawn so that any ongoing and future initiatives on IWSM would make use of them:

- IWSM should begin by identifying all relevant stakeholders and their respective roles prior to actual investment in the field. In addition to this, a clear linkage should be established among all actors and focus should also be given in integrating the roles of both levels and empowering the local level actors.
- In intent to rehabilitate any degraded watershed and to have a successful project, potential beneficiaries of the intervention should be involved and empowered in all the steps down the project implementation and establishment of appropriate management systems. Moreover instead of imposing intervention ideas to the community without their consent, other mechanisms like demonstration and experience sharing visits should be used to help the community internalize the importance of the intervention.
- IWSM programs should incorporate awareness raising as an integral part of the whole implementation process. Moreover, focus should be given at getting actively participating beneficiaries, and enhancing the evolution of strong local institutional arrangement.
- Donors should not only concentrate in one strand of the whole process of intervention like for instance financial and technical support but also should commit themselves to

take a wide arena of responsibilities including supporting institution-building, capacity building, conflict resolution, and continuous follow-up.

- Focus should be given on empowering the local authorities. A window should also be opened for the KA administration to play a pivotal role among all other local level actors in a cooperative manner. Moreover, IWSM should follow a decentralized local leadership that facilitates active participation of the beneficiaries in the management of the watershed.
- As most of Ethiopian rural communities are bound by a number of strong traditional institutions *(like Idir)*, that can assume big development role, integrated watershed intervention programs should create a conducive environment for willing and active participation of these entrenched institutions.
- IWSM programs should create an opportunity for elders and influential leaders to play their role since they can influence the society even sometimes more than the upper level institutions do.
- Concerned government bodies should actively and continuously involve in IWSM both in the implementation of the project and establishment of watershed management arrangements. Both the government authorities and donors should focus on empowering and building capacity of the beneficiary community for institution-building as opposed to articulating and briefing the by-laws to the community. The by-laws should be easily enforceable. The role of each actor should also be clearly articulated in the by-laws.
- In the case of CPRs management involving conservation activities, the boundaries of resource users should be clearly delineated based on the common consensus of the whole community on who should have access to the resources and who should not. The program implementers should take commitment to identify and include some relevant users who have been drawing benefits from the area prior to the intervention.
- Since conflicts on CPRs are inevitable, IWSM programs should consider development of effective conflict resolution mechanisms as an integral part of the program. Local level actors especially, *Idir*, elders, and influential leaders should be encouraged to participate in conflict resolution since they are dominant figures that can influence the community more easily than the upper level authorities.

- In general, focus should not only be given on the implementation of the program but also on the establishment of appropriate management arrangement. Besides this, peoples' livelihood concerns should be considered and appropriate incentive mechanisms should be employed to compensate for immediate benefits lost by farmers due to the introduction of the watershed intervention.

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Annex I

Semi-Structured Household Head Interview Questionnaire

1. General Information:

1.1.Date (Ethiopian Calendar): _____

1.2. Name of the Enumerator:_____

1.3. Location:

Zone_____ Woreda_____ Kebele_____Village/*Gott*_____

1.4. Time: Starting _____ Ending _____

2. Demographic information (to be filled by the household head)

Household head Identification number	Sex	Age	Marital Status[1]	Educational Status[2]	Social responsibility[3]	Major Occupation[4]
Total family size (including household head) M= F=						

1. Marital status: 1=Single 2=Married 3=Divorced 4=Widowed 5. Separated

2. Educational status: illiterate 2=Read and write 3=Primary School 4=Secondary school 7= other (specify in the table)

3. Social responsibility: 1=Religious leader 2=KA Leader 3=Elder 4=Ordinary community member 5=other (specify in the table)

4. Major Occupation: 1= Crop production 2. Livestock rearing 3. Petty trade (grain, local drink, firewood, etc) 4. Artisanship (carpentry, pottery, weaving, etc) 5. Student 6. Others (specify)

3. Economic Activities

1.Do you have your own farm land? 1. Yes 2. No

2.If your answer is 'yes' to question No 2 above, what is the total size of your farm land (in '*timad*')?_____

3.What is the trend in your land holding size? 1. Increasing 2. Decreasing 3. No change 4. Other (specify)_____

4.If your answer to question No 3 above is 'increasing', what are the reason/s behind the increment?

S. No.	Responses	Tick	Rank
1	Encroachment into forest area		
2	Land reallocation		
3	Cultivation of marginal land		
4	Other (specify)		

5.If your answer to question No 3 above is 'decreasing', what are the root causes?

S. No.	Responses	Tick	Rank
1	Increase in marginal land due to erosion		
2	Increase in marginal land due to loss quality		
3	Land redistribution with in the household		
4	Land taking		
5	Others (specify)		

6. What are the major constraints to crop production in the micro-watershed?

S. No.	Responses	Tick	Rank
1	Erratic rainfall		
2	Labor shortage		
3	Less access to input		
4	Drought		
5	Land shortage		
6	Soil erosion		
7	Pest and disease		
8	Other (specify)		

7.Do you have your own cattle at present? 1. Yes 2. No

8. How do you feed your livestock?

   1.Free grazing on communal grazing land 2.Own grazing land 3. Private pasture land

   4. Cut and carry from communal pasture land.

   5. Other (specify) _____ _____

9. Is there communal grazing land? 1. Yes 2. No

10. If your answer is 'yes' to question number 12 above, how do you manage it?

    1. Free grazing 2. Cut and carry 3. Rotational grazing 4.Restricted grazing

    5. Other (Specify) _____ _____

11. What are the major constraints in livestock production?

S. No.	Responses	Tick	Rank
1	Repeated drought		

2	Feed shortage		
3	Animal diseases		
4	Lack of vet services		
5	Other (specify)		

4. Land Degradation: Types and causes?

1. What were the major forms of land degradation before/after the watershed intervention?

S. No.	Responses	Before Intervention		After Intervention	
		Tick	Rank	Tick	Rank
1	Soil erosion by water				
2	Soil erosion by wind				
3	Deforestation				
4	Overgrazing of range land				
5	Gully formation				
6	Water logging				
7	Other (specify)				

2. What were/are the immediate root causes of land degradation before/after the watershed intervention?

S/No	Responses	Before Intervention		After Intervention	
		Tick	Rank	Tick	Rank
1	Overstocking				
2	Ploughing steep slopes				
3	Cutting trees for fuelwood and construction				
4	Limited use of conservation structures				
5	Continuation cultivation/no fallowing				
6	Others (specify)				

3. What were/are the underlying root causes of land degradation before/after the watershed intervention?

S/No	Responses	Before Intervention		After Intervention	
		Tick	Rank	Tick	Rank
1	Heavy rainfall				
2	Steep topography				
3					
4					
5					
6					

5. Local experiences and benefits from the watershed intervention

1. What were the major soil and water conservation structures you had used before the watershed intervention (multiple responses possible)?

   1. Terraces 2. Stone bunds 3. Check dams 4. Forage strips 5. Hill side terraces 6. others (specify)

2. What mechanisms did you use for gully treatment before the watershed intervention? 1. Stone check dams 2. Cut off drains 3. Planting trees, legumes and grasses 4. Others (specify)_____ _____

3. Do you think that the intervention was based on addressing your priorities, needs and preferences? 1. Yes 2. No

4. If your answer to question No 3 above is 'yes', what were your priorities that you wish the program would address?

   _____

   _____

   _____

5. What are the actual personal and communal benefits that you have accrued from the intervention?

S. No.	Responses	Personal (Tick)	Communal (Tick)
1	Increased crop production		
2	Increased access to livestock feed		
3	Reduced soil erosion from own farm		

4	Better access to potable water		
5	Increased irrigation water		
6	Increased demand for fuel wood and construction material		
7	Other (specify)		

6. Institutional arrangements and stakeholders involvement

1. Who are the major stakeholders involved in the watershed intervention?

   1. Government/development agents 2. NGOs (specify)_____

   3. Others (specify)_____ _____

2. Do you have any watershed management committee in the micro-watershed?

1. Yes 2. No

3. What was the intended objective for establishing the committee (multiple answers possible)?

   1. Issuing and enforcing by-laws 2. Responsible for mobilizing members for action 3. Site selection for further expansion 4. Others (specify)_____ _____

4. What are the major criteria you use to evaluate the strengths and the weaknesses of the watershed committee?

_____

_____

_____

5. What are some of the strengths and weakness of the committee?

   Strengths

_____

_____

   Weaknesses

_____

_____

6. If there is any weakness, what corrective measures do you suggest?

_____

_____

7. Is there a time limit on the number of years the committee members are expected to serve in the committee? 1. Yes 2. No
8. If your answer to question No 15 above is 'yes', how long is it?_____
9. What does the committee use to mobilize the community for action?

_____

_____

_____

10. What sanctioning mechanisms does the committee employ to ensure the compliance of members?

    1. Exclusion 2. Money punishment 3. Imprisonment 4. Labour contribution

    5. Others (secify)_____

    _____

11. Do you participate in meetings concerned with the watershed management? 1. Yes 2. No
12. What would you do, as a community, to a committee member if you feel that he/she is not working up to the expectation?

    1. Warning 2. Fired after repeated warning 3. Fired automatically 4. Other (specify)

13. Have you ever changed/modified any of the by-laws in the course of time?1. Yes 2. No
14. If your answer to question No 25 above is 'yes', would you please mention some of the by- laws you changed/modified ever?

_____

_____

_____

_____

15. What is the reason for changing?

_____

_____

16. Are there any by-laws that have been added very recently? 1. Yes 2. No
17. If your answer to question no 28 above is 'yes', would you pleases mention them?

_____

_____

_____

18. What are the major traditional institutions involved in the watershed management?

S. No	Traditional Institutions	Tick	Rank
1	*Idir*		
2	Mahber		
3	Others (specify)		

19. What is the role of *Idir* in the management of the micro-watershed?

_____

_____

_____

_____

20. What is the role of elders and influential leaders and the clergyman in the micro-watershed (multiple answers possible)?

    1. Conflict resolution 2. Support the committee in enforcing the by-laws 3. Support the committee in mobilizing the community for action

    4. Others (specify)_____

    _____

21. Has the watershed planning brought only new approaches to resource conservation or has it considered your indigenous practices only? 1. Introduced only new approaches 2. Considered our indigenous practices only 3. Used the mixture of both our indigenous practices and introduced ones

    4. Others (Specify)_____

22. What are the major local/indigenous experiences that are acknowledged and considered in the implementation process? (multiple answers possible) 1.Erosion control through diversion ditches 2. Tree planting to check flood power

    5. Others (specify)_____ _____

23. What is the role of Government/development agents towards resource management in the watershed? (multiple answers possible)

1.Provision of technical support 2. Granting legal ground for the by-laws 3. Supervision and advisory support 4. Training.

5. Others (specify)_____ _____

24. Have you ever witnessed any conflict among the community members within the micro-watershed? 1.Yes 2. No
25. What was the source of the conflict?

_____

26. Who played the key role in settling the conflict down (multiple answers possible)? 1. Elders 2. KA administration 3. The watershed committee 4. Woreda administration 5. Relatives on both sides 6. Others (specify)_____
27. Have you ever faced any conflict with your neighbors?1.Yes 2. No
28. If your answer to question No 50 above is 'yes', what was the source of the conflict?

_____

_____

29. Who played the key role in settling the conflict down (multiple answers possible)? 1. Elders 2. KA administration 3. The watershed committee 4. Woreda administration 5. Others (specify)_____ _____

7. Performance of the watershed Intervention (Additional Questions for Kanat)

1.How do you assess the performance of the watershed intervention in Kanat?

1. Successful 2. satisfactory 3. below expectation 4. failure

5. Other (specify)

2. If you appraise the performance as successful, what are the major factors that have contributed to the success of the intervention?

S. No.	Responses	Tick	Rank
1	Active participation of the beneficiaries		
2	Active facilitating role of government/development agents		
3	Strong and committed support of GTZ		
4	Excellent commitment and coordinating skill of the watershed management committee		
5	Others (specify)		

3. How has the government contributed to the success of the watershed management program?

   1. Creating enabling environment for actors 2. Mobilizing the community and awareness creation 3. Technical support (specify) 4. Material Support (specify)

   5. Other (specify)_____ _____

4. What is the role of GTZ in fostering the successful management of the watershed?

   1. Provision of technical and advisory support 2. Material support 3. Awareness creation 4. Institution building

   5. Others (specify)_____ _____

5. What more do you suggest (with respect to planning, implementation, benefit sharing and stakeholders' involvement) for intervention of such type to be successful?

_____

_____

_____

_____

8. Performance of the watershed Intervention (Additional Questions for Magera)

1. How do you assess the performance of the watershed intervention in Magera?

   1. Successful 2. satisfactory 3. below expectation 4. failure

   5. Other (specify)

2. If you appraise the performance as failure, what are the major factors that have contributed to the failure of the intervention?

S. No.	Responses	Tick	Rank
1	Low level of awareness and participation of the community		
2	Incompatibility of the program itself with our priorities, needs and preferences		
3	Administrative problems (specify)		
4	Labor shortage		
5	Natural disaster (specify)		
6	Others (specify)		

3. What do you think is/are the reason/s behind limited participation of your community members in the management of the resources (multiple answers possible)?
   1. Low level of awareness of the consequences of resource degradation 2 Failure of the watershed committee to mobilize
   3. Administrative problems (specify)_____
   4. Other (specify)_____ _____
4. Do you think that the government development agents have failed to play some of the expected roles during and after the intervention 1. Yes 2. No
5. If your answer to question No 5 above is 'yes', what do you think are the roles that development agents have failed to play?

   _____

   _____
6. Do you think that GTZ hasn't played some of the roles that it should?1. Yes 2. No
7. If your answer to question No 5 above is 'yes', what do you think are the failure on the part of GTZ during and after the intervention?

   _____

   _____

   _____
8. Do the major forms of land degradation, their causes, and consequences which existed before the intervention, still prevail? 1.Yes 2. No
9. What alternative approach do you suggest (with respect to planning, implementation, stakeholders' involvement, and benefit sharing) for intervention of this type to be successful?

   _____

   _____

   _____

   _____

Annex II

Checklist for Focus Group Discussions

Group Members:

S/No	Name	Age	Sex	Organization	Responsibility	Years stayed
1						
2						
3						
4						
5						
6						

1. Natural Resource: Issues, Trends and Status

1. What was/is the situation and status of micro-watershed before and after the treatment of the micro-watershed by GTZ?
2. What were the major forms of land degradation before the intervention; their causes; and consequences on agricultural production and the environment in general?
3. What were the major drivers of land degradation? (direct and underlying)
4. What were the local responses to land degradation long before the intervention?
5. If there was no intervention what so ever, what were the reasons for this?
6. What are the major interventions undertaken by GTZ in the micro-watershed?
7. How did the whole idea of the intervention evolve? Who was involved (role of different stakeholders)? What were the major steps taken? What institutions were established to support the intervention?
8. What were the specific measures taken to heal the watershed? And what were the direct effects of these measures?
9. Is there any communal grazing land in the micro-watershed? How is it affected by the treatment? How do you see the rangeland management practices before and after the intervention?
10. Does the program has any impact on land use/cover change? How? What is the trend in each type of land use type after the treatment?

11. Did the program develop watershed management guidelines? Did this include mechanisms for benefit distribution to the community?
12. What were the specific direct benefits the community gained from the intervention?
13. What were the specific indirect benefits the community gained from the intervention?

Institutional issues, the role of different stakeholders and benefits from the intervention

1. What is your role in the management of the micro-watershed? And how do you integrate your action with that of other stakeholders?
2. How is the level of awareness and participation of farmers in the management of the micro-watershed? Why?
3. What are the major formal institutions involved in the management of the micro-watershed? What is the role of each towards the success of the intervention?
4. What are the major informal institutions involved in the management of the micro-watershed? And what is their role?
5. Is there any resource management committee? If so what is its role? How was it established? Are there any by-laws? How do you establish the by-laws? Who developed them? How is their change over time? Who initiated the community to design and enforce the by-laws? What reward/punishment mechanisms does the committee employ?
6. Have you ever faced any conflict among the micro-watershed community and/or with the neighboring community? If you faced any, what conflict resolution mechanisms have you used?

Additional questions for Kanat micro-watershed (successful)

1. How do you appraise the watershed intervention in Kanat? (successful, satisfactory, below expectation, or a failure)?
2. What do you think are the major factors that have contributed to the success of the watershed intervention?
3. What do you think is/are the reason/s behind active participation of you and your community in the management of the resources?
4. How has the government/development agents contributed to the success of the watershed management program?

5. What is the role of GTZ in fostering the successful management of the micro-watershed?
6. What more do you suggest (with respect to planning, implementation, benefit sharing, and stakeholders' involvement) for intervention of such type to be successful?

Additional questions for Magera Micro-Watershed

1. How do you appraise the watershed intervention in Magera? (Successful, satisfactory, below expectation, or a failure)?
2. What do you think are the major factors that have contributed to the failure of the intervention?
3. What do you think is/are the reason/s behind limited participation of your community members in the management of the resources?
4. Do you think that the government development agents have failed to play some of the expected roles during and after the intervention? If your answer is 'yes', what do you think are the roles that development agents have failed to play?
5. Do you think that GTZ hasn't played some of the roles that it should? If your answer is 'yes', what do you think are the failure on the part of GTZ during and after the watershed intervention?
6. Do the major forms of land degradation, their causes, and consequences which existed before the watershed intervention, still prevail?
7. What alternative approach do you suggest (with respect to planning, implementation, and stakeholders' involvement) for intervention of this type to be successful?

Annex III

Checklist for Key Informant Interview, Personal Observation and Secondary Data

I. Checklist for key informant Interview

1. Name _____
2. Sex_____
3. Age_____
4. Organization/Occupation_____
5. Responsibility_____
6. Educational Status_____
7. Years stayed in the Kebele/Organization_____

a. Community Members/Government Staff/GTZ staff

Natural Resource: Issues, Trends and Status

1. What was/is the situation and status of natural resources before and after the treatment of the micro-watershed by GTZ?
2. What were the major forms of land degradation before the intervention; their causes; and consequences on agricultural production and the environment in general?
3. What were the major drivers of land degradation? (direct and underlining)
4. What were the local responses to land degradation long before the intervention?
5. If there was no intervention what so ever, what were the reasons for this?
6. What are the major interventions undertaken by GTZ in the micro-watershed?
7. How did the whole idea of the intervention evolve? Who was involved (role of different stakeholders)? What were the major steps taken? What institutions were established to support the intervention?
8. What were the specific measures taken to heal the watershed? And what were the direct effects of these measures?
9. Is there any communal grazing land in the micro-watershed? How is it affected by the treatment? How do you see the rangeland management practices before and after the intervention?

10. Did the program develop watershed management guidelines? Did this include mechanisms for benefit distribution to the community?
11. What were the specific direct benefits the community gained from the intervention?
12. What were the specific indirect benefits the community gained from the intervention?

Institutional Issues, the role of different stakeholders, and benefits from the intervention

1. What is your (the community's) role in the management of the micro-watershed?
2. How is the level of awareness and participation of farmers in the management of the micro-watershed?
3. What are the major formal institutions involved in the management of the micro-watershed?
4. What is the role of each towards success of the micro-watershed?
5. What are the major informal institutions involved in the management of the micro-watershed? And what is their role?
6. Is there any resource management committee? If so what is its role? How was it established? Are there any by-laws/ who developed them? How is their change over time? Who initiated the community to design and enforce the by-laws? What reward/punishment mechanisms does the committee employ?
7. Have you ever observed any conflict surfacing with in the micro-watershed or between your micro-watershed and the neighboring watersheds? If you observed any, what was the source of the conflict? How do you resolve conflicts when they surface?
8. What do you suggest with respect to planning, implementation, and stakeholders' involvement for intervention of this type to be successful?

Additional questions for Kanat micro-watershed

1. How do you appraise the watershed intervention in Kanat? (successful, satisfactory, below expectation, or a failure)?
2. What do you think are the major factors that have contributed to the success of the watershed intervention?

3. What do you think is/are the reason/s behind active participation of you and your community in the management of the resources?
4. How has the government/development agents contributed to the success of the watershed management program?
7. What is the role of GTZ in fostering the successful management of the micro-watershed?
8. What more do you suggest (with respect to planning, implementation, benefit sharing, and stakeholders' involvement) for intervention of such type to be successful?

Additional questions for Magera micro-watershed

1. How do you appraise the watershed intervention in Magera? (Successful, satisfactory, below expectation, or a failure)?
2. What do you think are the major factors that have contributed to the failure of the intervention?
3. What do you think is/are the reason/s behind limited participation of your community members in the management of the resources?
4. Do you think that the government development agents have failed to play some of the expected roles during and after the intervention? If your answer is 'yes', what do you think are the roles that development agents have failed to play?
5. Do you think that GTZ hasn't played some of the roles that it should? If your answer is 'yes', what do you think are the failure on the part of GTZ during and after the watershed intervention?
6. Do the major forms of land degradation, their causes, and consequences which existed before the watershed intervention, still prevail?
7. What alternative approach do you suggest (with respect to planning, implementation, and stakeholders' involvement) for intervention of this type to be successful?

Questions only for Government Staff and GTZ

1. What is your role in the management of the micro-watershed? And how do you integrate your action with that of the other stakeholders?
2. How is the level of awareness and participation of farmers in the management of the micro-watershed?

3. What is your role towards building active participation of farmers in the management of the micro-watershed?
4. Do you think that there is any difference in participation of the two communities? (Magera and Kanat)
5. If there is difference in participation, what do you think are the reasons behind?
6. Do you claim that both micro-watersheds were treated equally from the outset?
7. Do you claim that Kanat has undergone successful treatment and Magera has not? If so, can you explain the reason why so? What are the major visible indicators that characterize the two micro-watersheds?
8. How do you explain the institutional set-up and change in both watersheds? (for GTZ and Government staff)
9. Have you ever observed any conflict surfacing with in the micro-watersheds or between the micro-watersheds? If you observed any, what was the source of the conflict? How does the community resolve conflicts when they surface? What is your role towards conflict resolution?

III. Personal Observation Checklist (based on transect walk)

- Situation of natural resources (Soil, water and vegetation)
- Conservation structures (physical and biological)
- State of communal grazing land
- Major land use types
- Status of Soil erosion

IV. Secondary Data Checklist

- Geography (location, altitude, area map) and climate (rainfall, temperature)
- Agro-ecology, farming system and land use types
- Major economic activities, market and infrastructure
- Major crops produced and livestock reared
- The major constraints in crop and livestock production.
- The average land holding size in the micro-watershed and its trend
- Demographic data (total population, male female, fertility ratio, age group)
- Informal institutions
- Credit Institutions

Annex IV

List of Participants in Focus Group Discussions and Key Informant Interviews *(all the names are pseudonames)*

I. Focus group Discussion

Farmers Focus Group

Wowana-Magera KA (Magera)

S/N	Name	Age	Sex	Responsibility	Educational Status	Years stayed [1]
1	Getachew Abre	46	M	Kebele administration member	4th complete	2
2	Sahlu Kassie	36	F	Kebele administration member	Read and write	2
3	Asferaw Nigatu	42	M	Kebele administration member	Read and write	2
4	Mequanint Tekalign	48	M	Ordinary kebele resident	Read and write	
5	Bahiru Kebede	60	M	Elder	Read and write	
6	Wosen Tebike	45	F	Ordinary kebele resident	Read and write	

[1]refers to the number of years stayed in the position mentioned in *'Responsibility'* column

Hiruy-Abaregay KA (Kanat)

S/N	Name	Age	Sex	Responsibility	Educational Status	Years stayed [1]
1	Kbebew Tasaw	42	M	Ordinary KA resident	Read &write	

2	Solomon Nigusu	50	M	Elder	Read &write	
3	Fekade Masresha	54	M	Elder	Read &write	
4	Abebaw Demeke	80	M	Elder	Read &write	
5	Tadesse Endale	49	M	Clergyman	Read &write	
6	W/Aregay Taye	50	M	Clergyman	Read &write	

Government Staff Focus Groups

FWARO and SGAZ Agriculture and Rural Development Offices

S/N	Name	Age	Sex	Responsibility	Educational Status	Years stayed
1	Hailemariam Selassie	40	M	NR conservation and development, expert	B.Sc in Natural Resources M\anagement	6
2	Shimekt Behailu	50	M	Agronomist	Diploma in General Agriculture	10
3	Sahlu Abate	45	M	Natural Resources expert	B.Sc. in Natural Resources Management	7
4	Sebsibe Abate	36	M	Crop Protection Expert	B.Sc in Plant Sciences	6
5	Abayneh Teklu	41	M	Crop Production Expert	B.Sc in Plant Science	

Debre Tabor Town Agriculture Office

S/N	Name	Age	Sex	Responsibility	Educational Status	Years stayed

1	Muche Wube	35	M	Soil and Water Conservation Expert	Diploma in Natural Resource Conservation	4
2	Yohannes Taye	36	M	Forest and environment protection expert	Diploma in Plant Sciences	4
3	Tagelech Besu	37	F	Land administration expert	BA in Management & Diploma in General Agriculture	4
4	Selamu Negassh	34	M	Soil and Water Consevation Expert	Diploma in Natural Resource Conservation	3
5	Haymanot Tafesse	31	F	Forest and environment protection expert	Diploma in Plant Sciences	4

GTZ Staff Focus Group

S/N	Name	Age	Sex	Responsibility	Educational Status	Years stayed
1	Abay Zeleke	31	M	Natural Resources Management Expert	B.Sc.in Soil and water Engineering and Management	2
2	Tekeba Asamere	37	M	Natural Resources Management Field Technician	Diploma in Agricultural Cooperatives	12
3	Shimelis Amanuel	33	M	Nursery Foreman	8th Grade Complete	12

II. Key Informants

S/N	Name	Age	Sex	Responsibility	Educational Status	Years stayed
1	Markos Habtu[1]	41	M	KA Administrator	4th	5
2	Cheru[1] Mamo	38	M	Ordinary KA resident	3rd	
3	Masresha Ababu[2]	46	M	KA chairperson	4th complete	2
4	Gobeze Asmamaw [3]	25	M	DA (Natural Resource Conservation) of Magera KA	Diploma in Natural Resources Conservation	2
5	Olana Sifen[5]	37	M	Soil and water conservation Senior Advisor	M.Sc in Soil and Water Conservation	6
6	Ayalew Beza[5]	47	M	Crop Development Senior Advisor	M.Sc in in Agronomy	10
7	Selamawit Bekele[4]	37	F	Land administration expert	BA in Management & Diploma in General Agriculture	4
8	Tamagnsew Abaselam[3]	47	M	NR conservation, development, and land use team leader	B.Sc in Natural Resources M\anagement	11

[1]Hiruy Abaregay (Kanat) KA [2] Wowana-Magrea KA (Magera) [3]FWARDO [4]FWLUPAO [5]GTZ

Annex V

ቀን 05/04/...

የስብሰባዉ ቦታ ቻናቄ

ተሰብሳቢዎች የቻናት ቀበሌ የጂን ሜዳ ተፋሰስ ተጠቃሚዎች

የስብሰባዉ ዋና ዓላማ፡_በዊዝዉ ዉጋፍ የተሰራዉን የተፋሰስ ልማት ተረክቦ ለመጠበቅ ለመንከባከብና ለማልማትና ለመጠቀም የሚያስችል የአካባቢ ህገደንብ ለማዉጣት ሲሆን እነሆ ከዚህ በሚከተለዉ ሁኔታ ቀርቧል::

የአካባቢ ህገ_ደንብ

1/ ሁላችንም የተፋሰስ ተጠቃሚዎች በተፋሰሱ ዉስጥ የተሰሩ ልዩ ልዩ የፊዚካልና የስነ_ ህይወታዊ የአፈር መጠበቂያ ስራዎችን እንከባከባለን እንጠግናለን እንደተጨማሪም ባለ.. ሙያዎች በሚሰጡን የምክር አገልግሎት መሠረት እናለማለን የሚገኘዉን ማንኛዉንም ጥቅም ጥቅም በጋራ እንጠቀማለን::

2/ የለሙ የሣርና የዛፍ ዝርያዎችን ከልቅ ግጦሽ እንጠብቃለን በተራ ተመድበን በማጨድ ጥቅሙን እንጠቀማለን::

3/ የተፋሰሱ ኮሚቴ አስፈላጊ መሆኑን አምነንበት የመረጥን ሲሆን እነሱም የተፋሰሱን ህልዉና በበላይ ሆነዉ ይመራሉ ተገቢዉን ክትትል ያደርጋሉ ከዐጽር ኮሚቴዎች ጋር በመመካከር አጥፊዎችን እየቀረቡ በህገ_ደንቡ መሠረት ቅጣት እንዲቀጡ ያደርጋሉ::

3.1 የተፋሰስ ኮሚቴ አባላት ዝርዝር

1/ አቶ በራራ አንገዳ
2/ አቶ ወረታ ዳርጌ
3/ አቶ በላቸዉ ጫኔ ናቸዉ

4/ ቅጣት የሚያስከትሉ ሁኔታዎችና የቅጣት አይነት

4.1 ተረኛ ጠባቂ ሆኖ ከተመደበና በዐለቱ ካልተጠበቀ ብር 20 ይቀጣል

4.2 ተረኛ ጠባቂ ሆኖ አጥፊ ከብቶች በቅን በኩል ያስበላ 3 ብር ይቀጣል

4.3 ተረኛ ጠባቂ ሆኖ ለ3 ጊዜ በላይ አጥፍቶ ከተቀጣ ከዚህ በኋላ ከስራ ጥቅም ይከለከላል ከአንድም አባልነት ይሰናበታል::

5/ የጥበቃ ጊዜ ከጥዋቱ 1 ሰዓት እስከ 12ሰዓት ይሆናል

5.1 ከጧት ሰዓት በፊትና ከቀኑ 12ሰዓት በኋላ ከብት ያስገባ 30 ብር ይቀጣል

5.2 ለ2ኛ ጊዜ ከደገመ ከጥቅሙ ተሳታፊ አይሆንም

5.3 ጠባቂዎችን እምቢ ብሎ ያስበላ አረኛ ካለ 10ብር ይቀጣል

5.4 በጎ ... 4 ጠባቂዎች ይመራሉ ጥፋተኛ ሲያገኙ እንዲ ክስ ይህ ለሌሎች ስላት ስዎች መስካሪ ይሆናሉ ::

6. የተፋሰስ ጠባቂዎችን ለጥበቃ ሥራ የሚያዘ ከዚህ የሚከተሉት በ.ዎች ከጥበቃ ሥራ ነፃ

፭ ቸው ሰዎችን ግን ተራ ቸውን ይናገራሉ ከነሐሴ

6.1 ~~አቶ አለማየሁ ቀገስ~~ ፈለቀ ወ/አገኘ

6.2 አቶ ወጋው ካሳ

6.3 አቶ መርሻ ይገዛው

6.4 አቶ ወንድም አሰፋ

7/ በተፋሰሱ ውስጥ ተሰርቶ የተሰጠን የውሃ ተቋም ፲ ዘላቂ ጠግና ስለሚሰጠን በአግባቡ ለዘላቂነቱ እየጠገንን እንጠቀምበታለን::

8/ የቀበሌ አስተዳደር ሚና

8.1 የተፋሰስ ኮሚቴዎችን ማጠናከር ሥራቸውን በተገቢው ሁኔታ እንዲሰሩ ማድረግ

8.2 በሣምንት 1 ቀን ተሰብስበ ተፋሰሶች ያሉበትን ሁኔታ መገምገም ለችግሮች መፍትሄ መፈለግ

8.3 ኮሚቴዎች ሲያጠፉ ተከታትሎ በደንቡ መሠረት ማስቀጣት

8.4 ኮሚቴዎች ከሰበት ጊዜ በላይ ከጠፉ የሚከታተሉ ካሣና ጥቀም እንዲያገኙ ማድረግ

ከላይ የተጠቀሱት ህጎችን ለኮሚቴዎችም በቀደም ሉክተሉ መሠረት ይሰራል::

Declaration

I, the undersigned, declare that the thesis is my original work, has not been presented for a degree in any other university and that all sources of material used for the thesis have been duly acknowledged.

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