

**LIVELIHOOD AND SOIL CONSERVATION PRACTICES AMONG
THE FARMERS OF YAI CHEBO, OROMIYA REGIONAL STATE,
ETHIOPIA**

**A THESIS PRESENTED TO THE SCHOOL OF GRADUATE STUDIES
ADDIS ABABA UNIVERSITY**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
DEGREE OF MASTER OF ARTS IN SOCIAL ANTHROPOLOGY**

BY

ALEMAYEHU BELAY

NOVEMBER 2009

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**LIVELIHOOD AND SOIL CONSERVATION PRACTICES AMONG
THE FARMERS OF YAI CHEBO, OROMIYA REGIONAL STATE,
ETHIOPIA**

BY

ALEMAYEHU BELAY

COLLEGE OF SOCIAL SCIENCES

APPROVED BY BOARD OF EXAMINERS:

Thomas Osmond

Advisor

[Signature]

Mamo Heso

Examiner

[Signature]

Woldeas Teshome

Examiner

[Signature]

Acknowledgement

I am heartily thankful to my advisor, Dr. Thomas Osmond, whose patience, guidance and support from the initial to the final level enabled me to develop an understanding of the subject I was working on as well as the realization of this thesis.

I am grateful to the school of Graduate studies for granting the fund for this study, it was helpful.

I am indebted to Emeshaw Diro who has made available his support in a number of ways the whole period of data collection. Many thanks goes to Worku, the development agent in yaii chebo, for his continuous support and cooperation during my field work.

I owe my deepest gratitude to my family as a whole and especially the late Belay Zeleke, my father. Without you people, this thesis would not have been possible, thanks for your nonstop love and support.

I would like to show my gratitude to the people of yaii chebo. Words fail me to express your hospitality. Special thanks to my key informants who have devoted all their time and provided me with every bit of information I needed.

Lastly, it is my pleasure to thank all those whose names has not been mentioned but who made this thesis possible in one way or another.

TABLE OF CONTENTS

Acknowledgement	i
List of Tables	iv
Abstract	v
CHAPTER ONE: INTRODUCTION	1
1.1. Background of the study	1
1.2. Statement of the Problem	3
1.3. Research Questions	6
1.4. Objectives of the study	6
1.4.1. General Objective	6
1.4.2. Specific objectives	6
1.5. Significance of the Study	7
1.6. Data Source and Methodology	8
1.6.1. Primary data	7
1.6.2. Secondary Sources of information	11
1.6.3 Data Analysis	11
1.7. Scope of the Study	11
1.8. Limitation of the study	12
1.9. Organization of the thesis	12
CHAPTER TWO - CONCEPTUAL FRAMEWORKS	13
2.1. Human Adaptations and the Environment	13
2.2. Conceptualizing Livelihood	14
2.2.1. The sustainable rural livelihood framework	16
2.3. Diffusion of Innovations theory (The innovation-decision process theory)	17

2.3.1. Definition of Diffusion of Innovation.....	17
2.3.2. The Adoption Process.....	17
CHAPTER THREE.....	20
THE PEOPLE AND THEIR ENVIRONMENT	20
3.1 Physical features and Environmental setting.....	20
3.2. Settlement pattern, distribution and Religion	23
3.2.1. Social Hierarchies and power relations.....	25
3.4. Physical Rural Infrastructures: Transportation, communication and other facilities.....	25
CHAPTER FOUR: CHARACTERIZING LIVELIHOOD	27
4.1. Land tenure - Links to Environmental degradation and conservation practices	27
4.2. Land Use pattern.....	29
4.3. Agricultural Livelihood practices.....	30
4.3.1. Seasonal calendar, Crops and Cropping patterns	30
4.3.2. Animal Husbandry	33
4.3.3. Bee husbandry	34
4.4. Production strategies in the pursuit of livelihood adaptation	34
4.5. Role of Local Institutions in the Pursuit of Livelihood adaptation.....	37
4.6. Gender Division of labour in pursuit of livelihood adaptation.....	39
4.7. Non-farm economic activities in pursuit of livelihood diversification.....	40

CHAPTER FIVE	43
LOCAL PEOPLE’S PERCEPTION ABOUT SOIL EROSION AND EXISTING KNOWLEDGE AND ATTITUDE ON SOIL CONSERVATION PRACTICES	43
5.1. The Physical environment in perspective	43
5.2. Local people’s perception of soil erosion.....	44
5.3. Soil Conservation practices in Yaii chebo.....	53
5.3.1. Indigenous Soil conservation practices	53
5.3.2. Government and NGO initiated Soil conservation interventions in yaii chebo	54
5.4. Knowledge and attitude of farmers towards Soil conservation practices.....	59
5.5. Adoption of Soil conservation practices in Yaii Chebo.....	67
5.5.1. Contributing Factors in the adoption process	69
CHAPTER SIX:	73
INTERACTIONS OF ACTORS IN CONSERVATION PRACTICES	73
6.1. Identifying Strategic Groups.....	73
6.2. Local informal institutions	73
6.3. Local formal institutions	75
6.4. External Institution(s).....	75
6.5. Interactions among different actors in the Soil conservation scheme.....	77
CHAPTER SEVEN - SUMMARY AND CONCLUSION	83
BIBLIOGRAPHY	87
APPENDICES	
Appendix I. Checklist for Key informants and village elders.....	91
Appendix II. Checklist for Focus0group discussion.....	94
Appendix III. Questionnaire for household survey.....	97

List of Tables

Table 1. Land Use pattern.....	30
Table 2. Gender based seasonal calendar of activities.....	41
Table 3. Farmers' knowledge on soil erosion.....	60

Abstract

This study aims at analyzing the interaction between livelihood and soil conservation practices in Yaii Chebo, Ambo wereda. It particularly focuses on the factors which contribute for making decision to adopt soil conservation practices among farmers and power relations emerging as different actors interact in the conservation scheme. Observations, semi-structured interviews, focus group discussions, survey method and cases were used to collect data for this study. The farmers at Yaii chebo reside in an environment characterized by rugged and mountainous topography with steep slopes which naturally makes it vulnerable to land degradation in the form of soil erosion. Various factors like population pressure and a consequent deforestation, at different times in history, have made the degradation process aggravated. The interaction between the livelihoods of farmers and the environmental changes is so enormous to the extent of forcing farmers continually make small livelihood adaptations to their farming practices with their available resources. Among the major adaptations are soil conservation practices which were also encouraged and supported by governmental and nongovernmental organizations at various levels. Yet, the decisions to adopt soil conservation practices have more to do with other social factors than awareness level of farmers regarding soil erosion and soil conservation practices. Lack of resources mainly ownership of small plots of land impeded resource poor farmers from actively engaging in soil conservation practices. As soil conservation practices are long term investments, most farmers rather prefer to focus on the immediate subsistence of their households. Moreover, the soil conservation interventions has created a power hierarchy whereby access to farm information and alternative livelihood diversifying means are linked to previously existing ownership of farm resources leading to the relative advantage of resource rich farmers . The analysis showed; there is no guarantee that awareness leads to adoption of soil conservation practices. Holistic and contextual dimensions of soil conservation interventions will be needed to maintain a sustainable environment.

Key words: Yaii Chebo, topography, Livelihood adaptation, environmental change, soil erosion, soil conservation, awareness, adoption, sustainability

CHAPTER ONE: INTRODUCTION

1.1. Background of the study

The agrarian sector comprises of 85% of the Ethiopian population and contributes to 50% of the gross domestic product and 90% of the nation's export earnings. In a society so dominated by subsistent peasant agriculture, survival is inseparable to the exploitation of land. No area of the country is free from the imminent threat of land degradation (Alemneh, 1990).

Land degradation in the form of soil erosion and nutrient depletion presents a threat to food security and sustainability of agricultural production in many developing countries. Governments and development agencies have invested substantial resources to promote soil conservation practices as part of an effort to improve environmental conditions and reduce poverty (Kassie. et al, 2007).

The major cause of land degradation in Ethiopia is soil erosion. Nearly one billion tons of soil is lost each year due to erosion. Overgrazing, over cultivation, deforestation, over population, socioeconomic and political factors are accounted as major causes for soil erosion problems in the peasant agriculture (Alemneh, 1990).

The fear of losing the soil and its fertility which are the basis of agricultural production has driven experts, planners, researchers and decision makers to make tremendous efforts in soil conservation practices over the past years (Yohannes, 2000).

It is certain that smallholder farmers scratching thin soils on steep slopes of Ethiopia are directly threatened by the degradation process affecting their land. They suffer from uncertain environmental changes and decreased productivity on their land which ultimately affects their livelihoods.

There is a strong interaction between the livelihoods of farmers and the environment. For livelihoods based on agriculture, a change in the environment would mean a change in the lives of farm households. Land, making the most part of the environment, plays a crucial role in the livelihoods of farmers. But agriculture plays a significant role in shaping the environment powerfully. Thus, the interaction is so significant and a change in the environment means an inevitable effect on the livelihoods of many farm households.

For many subsistence Ethiopian farmers investing in soil conservation technologies and farming systems very often fails owing to economic factors, land tenure problems, absence of successful techniques or inappropriate agricultural extension systems, which supposedly impart knowledge to them. And other related factors such as perception and attitude of farmers towards conservation technologies are also significant factors (Kebede and Hurni, 1992).

This research is conducted in *Yaii Chebo* Peasant Kebele Administration (PKA) of Ambo wereda. Since last two decades, the PKA has been facing a significant environmental change and subsequent land degradation in the form of soil erosion which was hypothetically triggered by the steep slope topography; followed by overpopulation, deforestation, and over cultivation. Thus, this research focuses on the understanding the interaction of farmers' livelihood and environmental changes in the current context for a sustainable development endeavors. Specifically, emphasis is given on the livelihood adaptation of farmers and their perceptions towards the rapidly changing environment as well as their knowledge and attitudes regarding soil conservation measures.

1.2. Statement of the Problem

Many livelihoods with diverse socio-cultural structures and settings in Ethiopia have based their lives on the agricultural potential of high lands. Under subsistence agriculture, it is obvious that the livelihoods of many farm households depend heavily on the natural resources; mainly land, for their basic survival needs.

The community at *Yaii Chebo* resides in a place characterized by rugged and mountainous topography with steep slopes. As a result, environmental changes, particularly land degradation in the forms of soil erosion and deforestation, are highly significant in the area. More than 75% of the farm land in the area features steep slopes; and farmers plough on high hill areas. This coupled with rapid population growth has resulted in the degradation and loss of fertility of the soil threatening the lives of many households. In the last decade, there have been some efforts made by governmental and nongovernmental organizations (such as the German Technical Cooperation (GTZ)) in the areas of natural resource conservation and land use planning. Hence, this study shows high interest in characterizing the livelihood adaptations of the community who are living in such a rapidly changing and heterogeneous environment. Despite the enormous continuous efforts made on natural resource conservation and land use planning, land degradation in the form of soil erosion and deforestation is still a threat for the lives of many people in the area raising high concerns of sustainability. The interaction between the livelihoods of the farmers and the environment is so enormous. This proposed research is thus, an inquiry into how the community cope their lives in such a dynamic and changing environmental setting. In doing so, characterizes the main features of their livelihoods using sustainable livelihoods framework.

Further, the study gives emphasis to the level of Knowledge, Attitude and Perception (KAP) of the farmers regarding conservation practices

(innovations) which are mainly determinant factors for decisions in the adoption of conservation practices (innovations). In the current Ethiopian setting, in order to maintain the lives of many rural communities through improved production, natural resource (especially soil and water) conservation measures are of top priority to avert environmental changes (i.e. Land degradation in the form of soil erosion). The actual Knowledge, Attitude, and Perception (KAP) of the local community on the magnitude of land degradation in the form of soil erosion is not a reflection of the reality. This is to mean that due to the slow nature of environmental changes, it is often hardly noticeable to be averted.

Traditionally, adoption studies focus mainly on economic related factors. Although economic factors significantly determine the decision of farmers to adopt conservation practices (innovations), they fail to account for all adoption behavior. Socio-cultural factors are also highly significant for farmers when it comes to decision for adopting conservation practices (innovations). Hence understanding the social, cultural and other related factors of the peasant farmers and their livelihood is of paramount importance in order to develop sustainable soil and water conservation programs. Understanding why the farmers in the study area perceive and act upon their environment the way they do, should be understood in order to bring about a developmental change that is socio-culturally and environmentally sound. Since agriculture is a livelihood practice that depends entirely on a continuous productive capacity of natural resources; mainly land, to sustain production, its sustainability is of a paramount importance.

Moreover, due to its very nature, the altitude variation within every few kilometer distances on the ground has played a definitive role in terms of the heterogeneity of the livelihood arrangement and ways of life, the social networks of the community as well as their perceptions. Hence, understanding the variations of living arrangements of the community and

the contributing factors associated with the decisions to adopt conservation practices is of paramount importance.

Research works which have been done by other scholars in the areas of environmental degradation, livelihood adaptive strategies and soil conservation practices at different localities of the country have been summarized. These include; *'Major causes of environmental degradation and local people's adaptive strategies: the case of Babile in Eastern Hararghe'* by Selamawit Menkir; *'Adaptation, culture, and changing Environment: The case of the Gumuz of Diddessa valley (Kamasi Zone), west Ethiopia'* by Abeya Iffa; *'The adoption of soil conservation structures in the western catchment of Cherake river, Southern Ethiopia'* by Mulugeta Neka; *'Processes of soil erosion and aspects of community-based soil conservation in Grahutsa-Korir watershed in Eastern Tigray'* by Hailu Araya. This study differs in such a way that for one thing it also gives emphasis to the social and cultural factors that affect decisions to adopt soil conservation practices as well as the social interactions and the resulting power relations emerging as the different actors interact under the soil conservation interventions.

1.3. Research Questions

In order to materialize the rationale, the subsequent four guiding questions have been designed:

1. What are the characteristics livelihoods features of farmers and existing farming practices / strategies?
2. What are the Knowledge, Attitude and Perception of farmers towards soil conservation practices and indigenous conservation practices exist in the area?
3. What are the contributing factors for farmers to make decisions for adoption of conservation practices?
4. What are the interactions of different local indigenous and external institutions (actors) involved in conservation practices?

1.4. Objectives of the study

1.4.1. General Objective

The objective of the study is to analyze the interactions between livelihoods and soil conservation practices. It mainly focuses on factors which contribute for decisions to adopt soil conservation practices among the farmers and existing power relations which emerge between different actors involved in such conservation practices.

1.4.2. Specific objectives

The specific objectives include:

1. To characterize the livelihood features and farming practices of farmers in relation to soil conservation practices
2. To understand the Knowledge, attitude and perception of the farmers towards soil conservation practices, including the existing indigenous conservation practices
3. To analyze the factors that contribute for farmers to make decision of adoption of conservation practices (innovations)

4. To understand the interactions of different local indigenous and external institutions (actors) in relation to conservation practices

1.5. Significance of the Study

As there are little available research works done about Yaii Chebo regarding adoption of soil conservation practices (innovations) from a social and cultural perspective as the projects has just been recently finished, this study will serve as a baseline for further extensive studies. The study gives an insight on the factors to be considered when planning a development intervention; hence the findings will serve as a guide for intervention schemes for sustainable rural livelihood. And also the findings of this study will give input and place a room of flexibility for the already ongoing conservation interventions to amend gaps and drawbacks especially in the areas of equity and representation. In other words, understanding the levels and rates of adoption of conservation practices by farmers and the determinant factors in the decision of adopting conservation practices (innovations) helps to successfully implement further interventions. The fact that awareness cannot be a guarantee for adopting soil conservation practices by farmers, calls for a contextual and holistic approach for individual household needs when planning development interventions of such sort. Furthermore, the natural and social capital of the existing livelihood strategies will be identified, which further helps to combine the livelihood resources and come up with a sustainable livelihood strategy.

1.6. Data Source and Methodology

This research employed qualitative and quantitative methodologies. Both primary and secondary sources of data were used.

1.6.1. Primary data

The research mainly based itself on first hand information that was collected through different methods of data collection. Each method is used in the appropriate context to come up with the required information.

1.6.1.1. **Observation:** was one of the major data collection process starting from the initial up to the final stage of data collection process. The day to day livelihood features of the community, the social interactions, and reactions were visualized. Since the PA is full of variations due to the altitude differences, it was important to make transect walks with the local people looking at the effect of the physical environmental features in the variation of the livelihood adaptation of the community. Further observations were made on regular basis during some farming activities, mainly manual digging, Potato planting, Enset processing, terrace making.

1.6.1.2. **In depth Interview:** The selection of key informants was done at two stages. The first stage involved the selection of three key informants with the help of the local development agent. After one day discussion and interview with the three key informants, they have led me to other seven key informants which are highly respected people in the PKA. Semi-structured questionnaire was administered to collect relevant information from key informants, different personalities, and institutions. This method helped to collect vast amount of data on the historical events in lives of the community, their inter-ethnic relations in the surrounding area, environmental changes through time, changes in the livelihood adaptation of the community, social and cultural institutions and

their arrangements in the community. Interviews were also made with GTZ contact person at the project site, experts from Ambo Wereda agricultural and rural development bureau, Kebele officials of the study site, Development agents of the study site and local elders. As a result it was possible to collect data regarding the interactions of the formal and informal institutional networks that are involved in the development based soil conservation schemes

- 1.6.1.3. **Focus group discussion:** was held to get information on the livelihood adaptation of the farmers and how they manage their household resources to live in such kind of environment. As a result data were collected on their farming practices, environmental changes, and indigenous social and cultural institutions supporting their farming activities.

Because of the heterogeneous nature and its setting, the PKA was categorized into three zones. Hence, it was necessary to organize group discussions in each of the 3 zones. The group discussions were also organized in such a way that men and women groups were treated differently. This helped to discuss with women on issues which they would not have talked about if it was in front of their husbands due to cultural barriers. Hence, in each zone of the PKA two separate (for men and women); group discussions were organized. A total of 6 group discussions were held each group having 8 participants (i.e. a total of 48 people were participated in group discussion). The participants were selected through the help of the local development agent and some of the volunteer farmers. Following each group discussion, community resource mapping, proportional pilings for wealth status in the community and visualizing rainfall patterns through local materials were held to fully grasp the perception level of the community regarding their livelihood and environment.

1.6.1.4. **Household Survey:** was used as one of the data collection methods through questionnaires. To attain the objectives of the study, different categories of questionnaires were designed to collect relevant information from the target respondents. This method helped to collect data on the household resources such as labour arrangements, asset, capital and other strategies in the household that support and sustain life. Due to the topographical heterogeneity of the PA, it was classified into three sub zones for administrative purposes and hence stratified sampling technique was employed. The three sub zones are *Yaii Chebo (Altufa Oli)*, *Jidu Altufa (Mehal Altufa)*, and *Kabbi (Shimela)*. Around 25% the total 523 households, total of 130 households in the PA were selected as samples from the three sub zones on a random basis. However, since due to the lack of adequate data on the list of farmers in each sub zones and heterogeneity still after stratifying, it was beyond control to follow a strict random sampling in the strata. Hence the analysis of the quantitative data was limited only to simple descriptive statistics such as percentages and the data is presented in tables.

1.6.1.5. **Cases:** Case studies were used to understand the daily lives, socio-cultural and economic arrangements of selected individual households and their perspectives to conservation practices as well as to their environment. The cases are presented in each chapter based on their relevance to the specific issues discussed under.

1.6.2. Secondary sources of information

In addition to the primary data, secondary sources of information were also used to strengthen this research. Different books, electronic Medias, journals, bulletins were used to establish the theoretical framework and review of literature. Unpublished statistical reports from Central Statistical Authority (CSA) and various organizations were used as foundation to the data collected from the field. Also documents from Ambo wereda agricultural and rural development bureau, GTZ, as well as kebele administration were consulted in view of making a sense to the field data.

1.6.3 Data Analysis

The data collected at different levels through various methods were analyzed separately but finally the quantitative data from household survey and the insight acquired from the qualitative analysis that was collected through in depth interviews, focus group discussions and observation were integrated to make the final analysis.

The tape recorded during in depth interview, group discussion and individual interview was transcribed on paper. Simple descriptive statistical analysis has been used to analyze the quantitative data collected from questionnaires.

1.7. Scope of the Study

This research limits itself to an anthropological analytical perspective and deals with the understanding of the interaction between the livelihood adaptation and environmental changes among the farmers of *Yaii Chebo* giving emphasis on the existing knowledge, perception and attitude of conservation practices of the farmers as well as the indigenous conservation practices. And it also focuses on the determinant factors for farmers to make decision for adoption of conservation practices taking their livelihood as a general framework.

1.8 Limitation of the study

This research was not free of shortcomings. Even though I can understand contextually what the farmers were saying in Oromiffa, I had problems of fluency in asking in Oromiffa. Due to this I had to use a translator which might have affected the data collection process to a certain extent. The other problem was lack of enough anthropological books written on livelihood and environment.

1.9. Organization of the thesis

This thesis is organized in seven chapters. The first chapter contains the introduction of the research including the rationale and objectives of the research. The second chapter goes on explaining the theoretical frameworks of the research including the review of related literature. The third chapter characterizes the people at the research site and their physical environment. Chapter four has details of the livelihood features of the local people in the research site. In Chapter five, the perception of the local people about their environment, their knowledge and attitude towards soil conservation practices is explained. This chapter also discusses the soil conservation interventions made in the research site by government and non-governmental organizations and the nature of adoption of those soil conservation practices by the local people. Chapter six discusses the interaction of different actors involved in the soil conservation practices. The last Chapter presents the summary and conclusion of the study.

CHATER TWO - CONCEPTUAL FRAMEWORKS

2.1. Human Adaptations and the Environment

Human-environment relations mediated by culture have been a fundamental area of concern in ecological anthropology (Sutton, et.al, 2004).

Ecological anthropology focuses upon the complex relations between people and their environment. Human populations have ongoing contact with and impact upon the land, climate, plant, and animal species in their vicinities and these elements of their environment have reciprocal impacts on humans (Salzman and Attwood, 1996). Ecological anthropology deals with the ways in which human population shape the environment and the how the interactions result in the formation of social, economic and political adaptations.

There have been three broad ways of conceptualizing the relationship between human beings and their environments: First of all, human beings are shaped by their environments. This is to mean that human beings adapt to the environments in which they are living in and get shaped by the environments. Second, human beings shape their environments in such a way that it adapts to their needs. In this concept, human beings determine the nature of the environments to their context. The third concept in the human-environment relations is that human beings are in a constant interaction with their environment shaping one another.

Cultures and cultural features have been the fundamental units of analysis and objects of explanation until the adoption of the ecosystem approach. Bates and Lees (1996) explain that the ecosystem approach is useful model in terms of positioning each component as units that participate in the ecosystem rather than singling out cultural features to discuss human-environment relations. The interactive nature and mutual

relationship between human beings and their environment is often expressed through the idea of ecosystem.

An ecosystem is the structural and functional interrelationships among living organisms and the environment of which they are a part (Moran, 1990). Ecosystems are complex and can be viewed on different scales or levels.

Sutton, et. al, 2004, mentions that the most important contribution of the ecosystem model was the promotion of holistic approach to the study of units in their environments; human beings considered as participants in the ecosystem. Instead of seeking a single environmental cause for a specific physical or behavioral trait, a shift has been made to the total complex relationships in the ecosystem.

2.2. Conceptualizing Livelihood

The concept of a livelihood is widely used in contemporary research writings and rural development endeavors. It has been discussed among academics and development practitioners (Carney (1998), Chambers and Conway (1992), Ellis (2000)). The dictionary definition has put livelihood as a 'means of a living'; making it more than a mere income related concept. It rather connotes ways in which a living is obtained.

The most popular definition of livelihood is given by Robert Chambers, explaining livelihood in terms of what it comprises. "A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living (Chambers and Conway, 1992:7). On the other hand Ellis (2000) put livelihood as 'the activities, the assets, and the access that jointly determine the living gained by an individual or a household'.

However for Sandra Wallman(1984), livelihood is always more than just finding a means of living. It is equally a matter of the ownership and

circulation of information, the management of social relationships, the affirmation of personal significance and group identity, and the inter relation of each of these tasks to the other. All these productive tasks together constitute the work of livelihood. According to Wallman, livelihood is an umbrella concept, which suggests that social life is layered and that these layers overlap (both in the way people talk about them and the way they should be analyzed). This is an important analytical feature of the notion of livelihoods.

The two separate views to livelihood lie parallel with the formalist and substantivist dichotomy of economic anthropology. In the formalist economic approach the assumption is that individuals in every culture exercise rational choice in a means, ends, constraints and opportunities framework (Plattner, 1989), which makes it in line with the most popular definition of livelihood by Robert Chambers whereby resources are arranged in such a way to give the best possible livelihood alternative. Where as in the substantivist view economy cannot be defined on a model of choice based on scarce means, here economy is embedded in a society considered as one aspect of social life (Plattner, 1989). This approach take a relativist flag of modern anthropology, which makes it is parallel with Wallman's definition of livelihood, whereby it is an umbrella with overlapping layers of social interactions.

These dichotomies in the approach to livelihood significantly affect results of development interventions as well as their long term out comes. The more holistic and relativistic an approach becomes the wider its scope and the more effective it gets in dealing with multi faceted challenges faced. Yet the integration of the two views on livelihood result in a bigger picture for this study.

2.2.1. The sustainable rural livelihood framework

The concept of sustainable livelihoods is increasingly important in the development debate. A livelihood is a means of earning a living. Within the livelihood approach, a livelihood comprises of resources or assets or capital (human, natural, social, physical, financial capital and access to use these) that enables strategies to be employed in order to survive and attain desirable livelihood outcomes such as income, food security, well-being and sustainable use of natural resources (DFID 2001).

A livelihood according to Chambers and Conway (1992) is sustainable when it meets three conditions: Primarily, it should be adequate for the satisfaction of self-defined basic needs, secondly it should cope with and recover from stresses and shocks, it should maintain or enhance its capabilities and assets, while not undermining the natural resource base.

The livelihood framework has an advantage of placing adoption of conservation practices within the context of the livelihood resources and strategies of farm households and local communities, thus linking farming systems change, rural development, and natural resource management. (Cramb, R.A and Cualsero, Z, 2004)

The sustainable livelihood framework shows how, in different contexts, sustainable livelihoods are achieved through access to range of livelihood resources (i.e natural, economic, human and social capitals) which are combined in pursuit of different livelihood strategies (agricultural intensification or extensification, conservation agricultural practice or non conservation practices, livelihood diversification or migration) (Scoones, I 1998).

2.3. Diffusion of Innovations theory (The innovation-decision process theory)

2.3.1. Definition of Diffusion of Innovation

In his comprehensive book *Diffusion of Innovation*, Everett Rogers defined diffusion as the process by which an innovation is communicated through certain channels over time among the members of a social system. Rogers' definition contains four elements that are present in the diffusion of innovation process. (Rogers, 1962)

The four main elements are: (1) Innovation - an idea, practices, or objects that is perceived as new by an individual or group. In the Social aspects, innovation could also be an already existing set of information presented in a new form. (2) Communication channels - the means by which messages get from one individual to another. (3) Time - the three time factors are: (a) Innovation-decision process (b) relative time with which an innovation is adopted by an individual or group. (c) Innovation's rate of adoption. (4) Social system - a set of interrelated units that are engaged in joint problem solving to accomplish a common goal. In this research the social system could consist of the informal and formal social networking, the local indigenous and external institutions.

2.3.2. The Adoption Process

Rogers differentiates the adoption process from the diffusion process in that the diffusion process occurs within society, as a group process; whereas, the adoption process is pertains to an individual. Rogers defines "the adoption process as the mental process through which an individual passes from first hearing about an innovation to final adoption" (Rogers, 1962). This is to mean that though diffusion of conservation practices (innovations) for the communities is done the same way for all community members, the decision to adopt those particular conservation practices

always depend on the context of the individual farmer. The variation in the innovation-decision process lies on different social, cultural, economic and other factors.

2.3.2.1. Five Stages of Adoption

Although, more or fewer stages may exist, Rogers says that there are five stages of adoption. The five stages are: awareness, interest, evaluation, trial, and adoption.

In the awareness stage "the individual is exposed to the innovation but lacks complete information about it". At the interest or information stage "the individual becomes interested in the new idea and seeks additional information about it". At the evaluation stage the "individual mentally applies the innovation to his present and anticipated future situation, and then decides whether or not to try it". During the trial stage "the individual makes full use of the innovation". At the adoption stage "the individual decides to continue the full use of the innovation". For this case, an individual farmer as a result of different factors decides to continue fully use conservation practices.

However unlike Rogers who made clear distinction between technology adopters and non adopters, Robert Chambers (1990:5-6) puts a different perspective saying that farmers do not think in terms of adoption or non-adoption as we do, but select elements from technological complexes to suit their constantly changing circumstances. The dichotomous terms of adoption, non-adoption, traditional-modern, native-improved are irrelevant and misleading from the farmers' point of view. On the other hand Olivier de Sardan (2005) believes that technical messages, development projects and interventions are all packages or sets of coordinated measures which claim to be coherent, so they are never completely adopted due to the selection process done by the target group in this case farmers. He further

mentions that the rule is neither takes all nor leaves all; there comes the process of selective adoption and sidetracking. The logic behind all these is that farmers, in our case, seek safety to minimize risk of adopting a new practice, aid seeking behavior resulting from the intervention and monopolizing aid opportunities whereby some group are well prepared and managed to take the majority of the advantage and privilege from the rest of the other group. Thus, according to Olivier de Sardan, unlike Rogers, adoption is not a process based itself on awareness level rather a selective process whereby farmers only pick part of the interventions which they consider is less risky, which has external aid as well as the one who offers relative advantage.

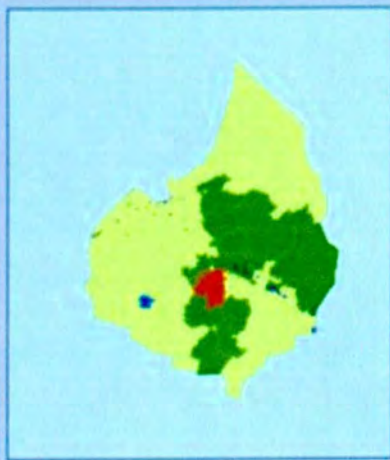
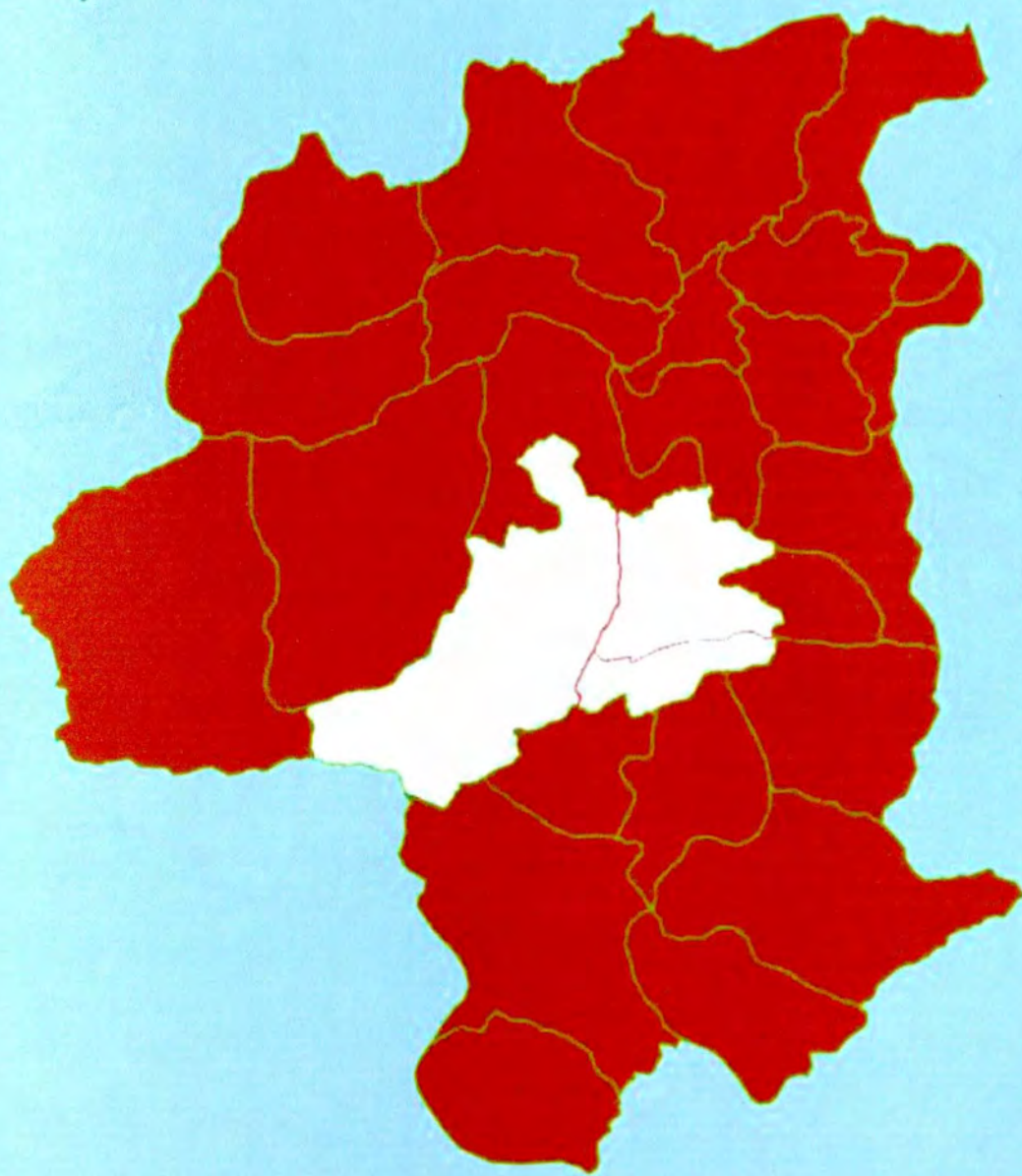
The adoption process is the main focus of this research. Why is the Adoption Process of any relevance to this particular study? Understanding the adoption process for conservation practices means knowing the livelihood dynamics of the farmers in the environment they are living in. This in turn lets us know why a particular farmer, groups of farmers or the community as a whole act the way they do towards conservation practices hence helping to develop a fully integrated sustainable development scheme that can be applied to the specific context.

Legend

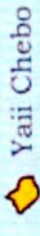
Woredas of West Shoa Zone, Oromiya Region



Zons of region



Legend



CHAPTER THREE

THE PEOPLE AND THEIR ENVIRONMENT

3.1 Physical features and Environmental setting

In the current Ethiopian Federal government administrative structure there are nine regional states, Oromia regional state being the major one with vast area coverage. The region is comprised of twelve zones including West Shewa administrative zone in which Ambo wereda is located.

Ambo wereda is located within a 125 km radius west of Addis Ababa. It has area coverage of 81674.39 ha with agro ecology of High land, mid altitude and lowland that constitutes 23%, 64% and 17% respectively. The most prevalent agro-climatic conditions, though there are considerable variations across locations, are tepid to cool temperature and moist to sub humid. The landscape varies from gently undulating plains and plateaus to rolling plateaus. The wereda borders with Dendi wereda of west shewa zone in the east, Toke Kutaye wereda from west, Haru wereda of south west shewa Zone from the south west and Elfeta wereda in the north.

The total population of the wereda was estimated in 1996 to be 96,245 of which 47161 are males and 49084 are females.

The farming system of the wereda is represented by mixed farming where crops and livestock are found side by side in every farm household. The land use in the wereda is comprised of 61203 hectares for cultivation, 8106 hectares for grazing, 898 hectares for forests, 895 hectares for institutes and residence, and other 11390 hectares of land for different purposes. Out of the cultivated area about 690 hectares is employed under irrigation, with 70 hectares of land under improved irrigation system (AWARDB: 2006)

The elevation of the wereda ranges from 1400 to over 3040 meters above sea level. The average annual rainfall ranges from 800 to 1000mm, while

the temperature varies between 6 and 29°C (Badiya, 2001). Based on the data found from the Ambo wereda agricultural and rural development bureau, the main soil types of the wereda include black, red and mixed with percentages of 34.37%, 36.25% and 9.38% respectively. Black soils constitute areas with the most production potential.

The major crops grown in the area are Wheat, Teff, Barley, Maize, sorghum, Faba bean, pea, Chickpea, Guaya, Lentil, Haricot bean, Oil crops, Flax, and Lin seed.

Along with the general trend in the country, forest trees are declining in the wereda too. Among the tree species that exist in the wereda; *Cupus hustanica* (Ferenj tid), bottle brush, *Acacia saligna* (ferenj girar), *saspania sasfani*, *cassuarina*, *Cordia Africana*, *Spatodia* (abeba zaf), *Acacia abyssinica*, *Gravilia robusta*, *Jacaranda*, *Koshim*, *birbira*, *Olea africana*, *Podocarpus* (zigba), *eucalyptus*, *truculent* are the major ones.

Ambo wereda is constituted from 32 peasant Associations and *yaii chebo* is one of the peasant associations located in the most highland part of the wereda uniquely characterized by its mountainous and steep slopes which are vulnerable and exposed to land degradation in the form of soil and wind erosion.

Yaii Chebo is comprised of two previously separate peasant associations; *Yaii Chebo* and *Shimela*. It is located 20 kms south west of Ambo town, right beneath the *Wenchi Mountain* and its crater lake. Based on the *Global Positioning System (GPS)* reading on the field, *Yaii Chebo* lies between 08°49.526'N latitudes and 037°53.012'E longitudes. Based on the data from the local administrative office, the total number of residents in the PA includes 1452 male and 1445 female who are distributed in the 523 households found in the PKA with an average of 6 persons in a household. The PKA has total area coverage of 1404.8 hectares. Out of the total land in the PA 76.7% (1077.4ha) is land for farming, 11.4% (160.6ha)

is grazing land, only 1.1% (15ha) is land covered with forest, . The Peasant Kebele Administration (PKA) is characterized by highland agro ecology, with 75% of the area featuring typical highland. The major soil types in the PKA include; 70% mixed soil, 20% red soil, 7% black soil and 3% other soil types. The major soil type is so thin in density and coupled with the sloppy nature of the area, it gets easily removed by wind and runoff.

Among the major crops grown in Yaii Chebo (in their order of importance) include: Barley, Wheat, Triticale, Pea, Faba bean, Lentil, Flax, Linseed, and Teff. Other than the grain crops in the area, Enset is the most important and vital staple food in the area covering a total of 120 hectares. Each household in the PKA owns a minimum of 0.125hectares of Enset plantation (this much high is the importance of Enset in the area).

Because of administrative, and topographic reasons the PA in categorized in to three sub Zones; Yaii Chebo (Altufa oli), Jidu Altufa (Mehal Altufa), Shimela (Kabbi). Because of the high variation in altitude for every few hundred meters of distance on ground, it was mandatory to take a GPS reading. Hence the PA lies in a 7.4km diameter (i.e. the distance between the top to the bottom of the PKA). Based on the GPS reading taken at field, the altitude of the PKA ranges from 2606 meters to 3177 meters above sea level (with 7 meters of accuracy). The bottom end of the PKA; Kabbi (Shimela) lies at an altitude of 2606 meters (with 7 meters of accuracy), Jidu altufa (Mehal altufa), which literally means the middle, is located 3.2kms away from Kabbie having an altitude of 2800 meters (with 7 meters of accuracy) and the highest end of the PKA; Yaii Chebo (Altufa oli) is 4.2 kms away from Jidu Altufa having an altitude of 3177 meters (with 7 meters of accuracy). Within the three sub zones of the PKA there is only 7.4 km distance on the ground where as the altitude variation is so immense to the extent of creating variation in the livelihood adaptation of the community.

3.2. Settlement pattern, distribution and Religion

The settlement pattern of the people in the area is significantly defined by the topography of the PKA, which is characterized by high steep slopes and rugged landscapes. Settlements are limited only to the tip of the slopes where there is a relatively less sloppy land to place houses and homesteads. Looking at the lower position of the PKA, it makes one realize the residential patterns following the chains of slope hills.

Religion in the area is highly significant factor and plays an important role in their adaptation to such kind of environment. Historically the people were Coptic Christians until the 1960s when the Missionaries came in and start to change some people to Protestant religion. And with current setting, there are as many as protestant believers, if not more, as the Coptic Christians. The introduction of protestant religion and the conversion that came along had both positive and negative implications in the lives of the people.

Traditional beliefs and rituals which used to exist are now being abandoned. The *gabaros* had their version of Boku (the previously shengo was changed and adapted to boku after the 17th century) which remained strong and independent despite the existence of *Boku Chitu*, *Boku Tulle*, *Boku Inchini* and *Boku Cheliya* among the Oromos in the surroundings. Every year on the 3rd day of October there is a ritual ceremony called 'Adabina', held by the Yaii Chebo Boku under the big tree named Yaii Chebo - hence the name of the PKA. The Aba boku gives blessings and slaughter animals for the ceremony. The Yaii Chebo Boku also served as a local political and religious institution where the people abide by. Marriage rules and regulations, dispute settlements, making other important regulations were among the major role of the Boku. However, due to the high rate of conversion of the people into protestant religion, they have abandoned it since the last couple of years.

As the Aba Boku mentioned it, 'the people are not coming on the big day of (3rd of October). Last year, I went out to the tree (Yaii Chebo) alone for the Adabina ceremony. People have abandoned me. They changed their religion and left their tradition. They say it is Satanic, I don't see any satanic thing in our tradition. This has been our tradition for many years, it is so weakened now; and because of this even some of our own people are going down to attend the Boku Chitu (the famous political and religious institution among the Mecha Oromo which is celebrated near the town of Ambo).

However, it is rational to think that the shift to protestant religion might be one form of adaptation by most of the people in Yaii Chebo to their rapidly changing environment. As life gets more at stake and survival takes the toil out of them, people needed a way out, a flexible and adaptive outlet. Fulfilling social expectations for instance Cultural feasts, ceremonies and rituals at the *Adabina* are out of the picture when there is a low productivity as a result of environmental degradation, hence looking out a flexible and adaptable social inclusion in this case being protestant could be an alternative form of adaptation that fits for their current livelihood settings. Moreover, there is also a change in the cosmology of the people along with the shift to protestant religion. There are two strong protestant churches in the PKA (Muluwengel (Full gospel) and Mekaneyesus) which have their own 'amentotas' (believers) and their own separate churches. The churches also participate in educating their believers regarding HIV/AIDS, and in the areas of empowering women to have their own source of income through trainings.

3.2.1. Social Hierarchies and power relations

According to Barlett (1980), access to power has directly related to access to and ownership of resources. Apart from the variability in the topography of the area and the resulting variability of farmers in their livelihood adaptation, there are also other factors which created social hierarchies in Yaii Chebo. These include; wealth status, age, religion, access to information and farm resources, are the major ones. All these factors have also showed significant relation to the soil conservation practices in the PA.

3.3. Physical Rural Infrastructures: Transportation, communication and other facilities

Physical rural infrastructure plays a pivotal role in terms of bringing about social change. In spite of being located mid way between the towns of Ambo and Weliso, rural infrastructure in Yaii Chebo is poor. There is gravel road that connects the two towns passing through Yaii Chebo. Rural electrification is yet to be implemented as the cables were being stretched during the data collection period of this study. Except for the small water well strengthened by GTZ covering only the top end of the PA, there is no access to drinking water for the community. They travel long distance to the already dwindling springs in between the mountains to fetch water.

There is one health station in the PKA providing first aid, labor and family planning services. Even though information is important for the present day farming, especially to get up to date market information, there is no telephone service in the area.

Transportation to and from Yaii Chebo is limited only to market days in Ambo town. Market days in Ambo are Tuesday and Thursday. There is bus transportation every Tuesday and Thursday that gives service to and from Yaii Chebo for 5 Ethiopian Birr (ETB). The farmers bring their crop

produces and livestock to big markets in Ambo town for sale. There is a small market in Yaii Chebo as well which mainly are operated by women (more like women market) where items that are important for daily household needs are exchanged.

There is one Junior school in the PKA and students who make to secondary schools have no option other than going to the nearest town; Ambo in this case, to continue their education. And this has an implication on the household strategy as students stay away from the household for education and also incur additional expense to the household to rent accommodation and cover food expenses in Ambo town

There also exists a Development agent office. The three local level Development agents who work on the areas of crop, animals and natural resource management give the necessary technical support to the farmers.

Different external rural development organizations work in the PA with different intervention areas and goals; organizations like Eshet and Oromia micro finances work in the area of providing credit to the farmers, GTZ-SUN-Oromia work on natural resource management, the activities of which this study will focus on, and Ambo Community Based Development Program (ACBDP) works in the area of grain marketing.

Plates I. Topography



1 An overview of part of the PA



4 Villages usually lie following hill tops



2 steep slopes –major feature of the PA



5 Terracing made on farm fields



3 Terraces made on the upper part of the PA



6 Enset is the major part of farmers' livelihood

CHAPTER FOUR: CHARACTERIZING LIVELIHOOD

4.1. Land tenure - Links to Environmental degradation and conservation practices

Land tenure is an umbrella concept that refers to the body of rules and regulations governing the terms and conditions under which land and land resources are held, utilized, and disposed of (Yeraswork, 2000:12-13). It is through land tenure laws and regulations that one gets access to land or excluded from the use of land.

Under the current Ethiopian constitution and land policy system, land belongs to the state. Land cannot be sold or exchanged hence farmers do not have the right to sell land but they have the property right of making use of the land. As it has been mentioned by several scholars at different instances, this kind of system leaves a gap for policy implications when it comes to conservation practices. Terefe Degefa, mentions that the persistence of state land ownership allows the continuation of the problems of resource use and conservation and creates links environmental degradation (Terefe, 2002: 94). Farmers lost their confidence about the land they are using somewhere on the path, which makes them refrain from boldly investing on conservation practices. Even though the efforts are fragmented, non uniform, and out of political motives, very recently the government had started giving land use right certificates to the farmers which could strengthen the confidence level of farmers to invest conservation measures on the land.

In Yaii Chebo, the last time land distributed to farmers was in 1975, just a little more than 33 years ago and there was no land redistribution held after that. This means rural household heads with the age of 30 and less do not have the property right to use land that is given through official channel. Most of them get access to land either only through gifts or inheritance from their families. The number of households without land is

significant. This happened primarily, as a result of the returnees of Derg veterans; those who were very young and left to join the army right before the fall of the Derg in 1991, and came back to establish families. Some efforts had been made in the case of the Derg veterans to distribute small plot of lands, which were once communal lands for their farm use. Secondly, youth who once went through the secondary education and fail to pass through college or anything equivalent have the only option of going back to their place and establish family.

One of the threatening issues Ethiopia has been confronted with for the last several decades is the problem of environmental degradation (Terefe, 2002). According to Terefe, these problems are more prominent in the highlands, which supposedly are believed to contain sufficient flora and fauna, dependable soils and climatic conditions conducive to attain high levels of agricultural production. But the reality is that Ethiopian highlands are the most degraded lands in Africa (Ibid).

In general the most well spoken causes of environmental degradation, particularly soil erosion, revolve around population growth, agricultural production practices, physical/geological forces, wars, political instability and land tenure systems, among others. And Terefe goes on saying that, as a result of the various and multifaceted causes of environmental degradation, there is confusion and disagreement as to the main causes of environmental degradation in Ethiopia, and therefore a reliable explanation on the basis of which policies are formulated has not been easy to obtain (Terefe, 2002). Terefe also believes that in the Ethiopian context, land tenure systems are believed to be one of the leading causes and triggering forces of environmental degradation saying that tenure insecurity creates resentment among farmers in the issues such as conservation of land resources; mainly soil and forest.

Issues of land tenure go from an already bad to worse conditions in Yaii Chebo where there are quite considerable households without any right to use land. This coupled with an already insecure land tenure system means that conservation practices are way beyond from being considered. Even though soil conservation structures like terraces are built in the forms of campaigns in the PA using the development groups (*Gere*) formed in each got, the issue of land is one of the big impeding reasons to farmers whether to involve in conservation practices.

4.2. Land Use pattern

Land use plays a crucial role in the interaction between livelihoods and environment. It is through land use that the interaction of livelihood and environment is clearly visible. Land use practices are highly essential because they either directly provides critical natural resources and ecosystems services or through efficient land use practices natural resources are converted into useful products (Soini, 2006).

Environmental factors like altitude, rainfall and temperature have a determinant role which land use practices are possible. Decisions to be made regarding land use practices are highly dependent on the environment (Barett, 1980b).

On the other hand land use practices are always under the influence of the land tenure system, the social, cultural, economic and political arrangement of a society. In Yaii Chebo, the GTZ-SUN-OROMIA project has made efforts to make farmers setup efficient land use system, which in most cases was not well taken up by the farmers. However based on the existing data at the PA, the land use patterns looks like as follows.

Table 1. Land use pattern of Yaii Chebo peasant kebele association, 2008/09

No	Land Use	Area of land (ha)	Percent (%)
1	Land on farming	1077.44	76.7
2	Grazing land	160.61	11.4
3	Resident and homestead	146	10.4
4	Forest land (mainly man made forest and a little percent of natural forest)	15ha	1.1
5	Communal land mainly used for social purposes	0.75ha	0.05
6	Others	5ha	0.35
	Total Area	1404.8	100

Source: Adapted from Socio-economic profile of Yaii Chebo development office

4.3. Agricultural Livelihood Practices

4.3.1. Seasonal calendar, Crops and Cropping patterns

Seasons, which have a significant definitive role in the livelihood adaptation of the farmers, are categorized into four. Farmers know what is expected of them at each different season to keep their survival intact. June to August is the major raining season known as *Ganne*; September to November as *Birra*, December to February as *Bonne* and March to May, which is the small raining season known as *Arfasa*. Farmers grow crops in *Ganne* and *Arfasa*, during which there is a lot of farm work to do for the household. During *Bonne*, the crops that are grown are harvested and threshed. April to August and November to December are the busiest seasons for farmers during which land preparation, ploughing, manual digging, mowing, harvesting and threshing are conducted. In *Arfasa*, farmers who reside mainly on the highest part of the PA plant potatoes

and harvest it in the main raining season (*Ganne*), where there is high food shortage in the household. During the field work, I have observed that in the highest part of the PKA farmers plant Potatoes in the month of February, on dry, with no drop of rain available. The soil was blowing by the wind when they plough it and yet the farmers told me that the soil at this part of the PKA has moisture inside and it can grow potatoes with no rain. To my surprise, I witnessed the dry planted potatoes emerging after few days and even a week before the short duration raining time in *Arfasa*. This kind of adaptation does not exist on the lowest part of the PKA (Kabi) where the soil is drier having less moisture to support crops with no rain.

Land preparation for farming and the types of crops to be grown are highly determined by the factors related to topographic and soil fertility variations in the PKA. Usually, there are two different categories of land preparation in Yaii Chebo. Due to the severe intensity of land degradation, particularly soil erosion in the area over many years, the fertility of the soil has declined tremendously. Hence, farmers started to adapt fallowing technique (although use of fallowing is reducing these days due to lack of land) whereby they farm a particular plot of land for one year and then leave it unused in the second year to make the soil rejuvenate for the coming production year. As a result, there are two different categories of land preparation; one for the land which has been left fallow and another for the land which has already stayed in production. Land preparation for fallow lands always takes more time as the land which was abandoned for one production year grow grasses and weeds and get harder to plough. In this, case land preparation starts as early as September or October and through a long process the land becomes ready for crops in *Arfasa* or *Ganne*. Land preparation starts in *Arfasa* for the land, which has stayed in production from previous year at the onset of the first rain. For this particular case, the land has been already in use from previous year

production and the soil is softer and lighter, hence preparation starts as late as the start of the rain to avoid wind erosion.

Despite the variation in adaptability, there are various crops grown in Yaii Chebo. In general, Enset, Barley, Wheat, Triticale, Pea, Faba bean, Lentil, Flax, Linseed, and Teff are among the major crops grown in Yaii Chebo. However, farmers in each of the three zones of the PKA have their own way of adaptation to the types of crops that fit their contexts. For instance, Teff does not grow in the most highland part of the PKA (Yaii Chebo), where as it is among the common crops grown in the lower part of the PA (Kabi). This variation mainly is accounted to factors that associated with the variation in altitude. The higher the altitude the less is the diversity of crops grown.

Generally, Enset plays a central role in the livelihood of the farmers. It is one of the major staple and life sustaining food crops available in all parts of the PA. Yet at the highest part of the PKA, farmers depend on Enset more than their counterparts at the lowest end of the PKA. This is due to the fact that Enset is more adaptable having big biomass in the highest altitude and also lack of diversity in the cropping patterns among the farmers residing in this part of the PKA, which made them rely on Enset as the major food source more than any other crop.

4.3.2. Animal Husbandry

Animal husbandry is one of the integral practices in a mixed farming system. The competitive nature of crop and animal husbandry for land is always a crucial point in a mixed farming system. Livestock represents a central element in the livelihood adaptation of the farmers of Yaii Chebo. Cattle, sheep, donkeys, horses, Chicken, and goats are the major livestock integrated in most farm households. Draught animals like oxen and pack animals such as donkeys and horses have a more central role in the farmers' lives.

Although, there is lack of consistent information from the local offices on the currently existing number of livestock in the PKA, the farmers mentioned that the number is dwindling from time to time. This is associated with interrelated constraints such as shortages of pasture land and geographical location of the PKA itself. Due to population pressure, what once were grazing lands are turned into croplands forcing the animal husbandry to shrink significantly. According to farmers, there were cases where livestock could be kept and graze in forestlands in between trees. And now since most of the forest in the PKA has been destroyed and trees cut down, even this chance has gone. In addition, because of the topography of the PKA, the steep slopes are always threats to domestic animals as they slide and fall from cliffs. During my field work, I came across with many farmers who have lost at least one or more of their animals, mainly cattle because of this. All these factors have now forced farmers to reduce the number of livestock they manage in their households to a size that is a reflection of their existing conditions. Fodder grass growing on the bunds on the soil conservation structures (terraces), is the major grazing area that is available for the livestock of most farmers.

4.3.3. Bee husbandry

According to the information collected, bee husbandry was a common practice among farmers for many years in the area but has been abandoned along with the deforestation of forests, which has a close tie to bee husbandry. However, there are few farmers who own bee hives at present. Modern bee hives are also being introduced in the PKA through the Ambo wereda agricultural and rural development bureau.

4.4. Farming practices in the pursuit of livelihood

Based on the available resources in their household as well as in the community, farmers follow integrated ways of production strategies to sustain their lives. Cultivation of plots by their own draught animals (oxen), manual digging using digging sticks especially on high steep slopes where it is impossible to use oxen, exchange of oxen for labour, exchange of oxen for grain, exchange of land and oxen, exchange of grain and labour, exchange of labour for labour, sharecropping land, renting land, obtaining oxen through social networks, use of household labour, reciprocal labour mobilizations (local labour exchange networks), hiring farmers for a cropping season, hiring farmers or daily laborers for a peak season, mainly during land preparation, sowing and harvesting seasons are lists of strategies followed in their farming.

Cultivation of plots by their own draught animals (oxen): farmers who are endowed with the required resources such as a pair of oxen or more plough their or rented land with no much difficulty unlike the resource poor farmers who has t follow different exchange mechanisms to make a survival.

Manual digging using digging sticks: Due to the topography of the PA, not all farm lands are easily accessible for oxen ploughing, hence farmers use digging stick, twin ploughs attached in one digging stick. It is one of the most important farm implement that exist in every household. Farmers

dig plots of land that are located near river banks, and on high steep slopes. The use of manual digging is more common in the higher part of the PA where slopes get steeper.

Exchange of oxen for labour: Farmers who do not own oxen or who only own a single ox and in need of a second one, work in the farms other farmers in exchange for oxen so that they plough their plots of land.

Exchange of oxen for grain: Resource poor farmers who lack pair of oxen agrees to exchange oxen with the crops they will be growing. Due to the uncertainty production could fail as a result of different factors but the farmer is expected to give the amount of grain he had agreed to give for the farmer with oxen. He could buy the grain or borrow it.

Exchange of land and oxen: This method is mostly used in the PKA by female headed households who own land but do not have a male household member who could plough the land. Hence, women give away their lands so that another farmer works on the land and give some part of the produce. Since it is out of no choice, women get less amount of the crop produced on their own land.

Exchange of grain and labour: Farmers who do not have enough plot of land to support their family work for resource richer farmers in exchange for grains. The amount always varies on each specific case.

Exchange of labour for labour: This is where by farmers exchange labour for labour on individual agreements.

Sharecropping: This is very common arrangement of production in which, resource poor farmers share crop after working at the farm of an oxen owning farmer. The amount varies depending on specific cases. When the shared amount is equal it is called *Kitie* in Yaii Chebo.

Renting land: Due to the high growing population and newly formed households, land is the scarcest resource in Yaii Chebo. There are quite a lot of households without any access to land. In such cases, renting land is the only outlet available to keep producing and feed the family.

Obtaining oxen through social networks: this exists among households with marriage and kinship ties. It could also be used by some farmers to help female headed households, who do not have a male member in their house and who only own lands.

Use of household labour: the very common and readily available arrangement. Labour outside of the household is usually considered when the household labour is not enough to cover all the farm works being undertaken.

Reciprocal labour mobilizations (local labour exchange networks): This is an arrangement based on the existing local labour exchange organizations where by labour it exchanged reciprocally.

Hiring farmers for a cropping season: There is also an arrangement of hiring a farmer for resource endowed households in the PKA. In such cases, the household head often tends to engage in other income generating activities like grain trading to diversify livelihood in the household.

Hiring farmers or daily labourers for a peak season: During the peak seasons of the production year, it often happens that household labour is not enough to cover all the farm work. Hence, resource poor farmers or daily labourers are hired for land preparation, weeding, and harvesting.

Plates II. Farm activities



1 Forest land to farm land – hand plowing (didika)



4 Enset processing - women's responsibility



2 Planting potato during the dry season



5 Preparing the pit for Enset



3 Threshing of 'samareta' by livestock



6. Burnt forest land to be changed to farm land

4.5. Role of Local Institutions in the Pursuit of Livelihood

Based on neighbourhood, marriage and kinship ties, religious beliefs (specifically for Protestants), production work groups and friendships, there are local institutions/organizations serving different purposes in the community. Among the major ones include, *Dado*, *Sheni*, *Debo*, *Golobie*, *Modi/Edir*, *Equib*.

Dado is a labour cooperation for farming activities among small group of farmers on reciprocity. It is mainly based on friendships and neighbourhood. The cooperation involves manual digging of fallow lands or new lands which are being changed into farm lands, land preparations and other farm activities. For women's case *dado* is used to cooperate labour mainly for Enset processing.

Sheni is another labour cooperation network in the area with a similar arrangement to *dado* except that the number of farmers in *sheni* is bigger than *dado* ranging from six to nine farmers participating.

Golobie is a mutual self help social cooperation used at the times of death and emergency. It could be constituted from 20-30 neighbouring households. Members collect small amount of money each month that could be during the death of any community member or for emergencies like death of cattle. In Yaii Chebo, social cooperations like this one have been adapted to fit their contexts. Due to the threat caused by the topography of the PA on livestock rearing, it is a common phenomenon that domestic animals fall from cliffs and die. During such cases, if the animal is ox, then the members of *golobie* collect money and give it to the farmer whose ox has died. But if it is a cow or sheep, they slaughter the animal right before it dies and distribute the beef and put some value of money so that the farmer get back at least some part of his loss.

Modi/Edir is the biggest mutual self help social cooperation in the PKA which is used during death and emergency situations. Different *golobies* come together to form the *MOdi*. Hence each farmer is a member of *golobie* at neighbourhood level and *modi* at the community or PKA level. Other than giving hands during emergencies like cattle deaths, *modi* also cooperate labour to plough the lands of the elderly who do not have anyone in the household to work on the farm and cannot work by themselves.

Equib is another social cooperation in which money is voluntarily pooled by members and the sum is rotated among them mostly on a monthly basis. *Equib* was found to be more common among women groups who are engaged in small trading.

Other than the above local institutions, there is now a trend among protestant believers to cooperate for different farm and nonfarm activities. This is more significant among resource poor female household heads that seem to be more ignored by the other part of the community, despite being members of *golobies* and *modi*. Hence, they rely and seek religious grouping for social inclusion.

Case 1. As one of my female informants told me, *my husband died leaving behind our two children to me. His relatives took all the land we had and here I am with no real source of income. I try to earn small amount by making pottery and selling it on the Friday market here, preparing local drinks and mudding newly built houses. The protestant church is now organizing women like me to have a cooperative and we are making small savings every month. I am hopeful that our cooperation will be successful.*

This is one example indicating how those small groups who could not cope up with the expectation of the majority of the community members seek social inclusion.

4.6. Gender Division of labour in pursuit of livelihood

Understanding how men and women are related in the agricultural production system in terms of their roles and responsibilities, access to and control over resources, benefits, and decision making system in a society is crucial to analyze their adaptation strategies (Alemayehu, et.al, 2007).

Women in Yaii Chebo play significant role in the farming system. Women involve both in the household and farm activities. Women engage themselves to all the time consuming productive activities. They are responsible for all the household work including food preparation, fetching water, fuel wood collection, and taking care of all the household members. In addition, they also help in farm activities. Apart from taking food and drinks to the field especially at the peak seasons, they are highly involved in land preparation, weeding, harvesting. Even though they participate in harvesting, they are allowed only to uproot legume crops like peas, lentil and bean. They are not believed to be strong to mow barley and wheat, which are tied into bundles.

Enset processing is an entirely women activity in Yaii Chebo. Men do not get near the Enset yard when women are processing, it is a taboo. As they told me from the separate women's focus group discussion;

Our husbands do not enter into the enset farm while we are processing. It is believed that if a man enters, the part of enset that is buried into pit will be rotten. During the day on which Enset is processed a woman do not eat lunch with her husband, she eats separately. It is our culture. If a woman

had sexual intercourse with her husband in the previous night or if she is on menstruation, she is not supposed to work on enset processing on the next day. However, since enset is processed through dado, her friends will work for her.

However, they also mentioned that these kinds of taboos are now being loosened up due the influence of the protestant religion. Most protestant households are starting to abandon these beliefs.

Women are also highly involved in community ceremonial activities as they prepare food for feasts.

4.7. Non-farm economic activities in pursuit of livelihood diversification

Farmers in Yaii Chebo have a relatively slack period after they sow their crops and after harvesting periods. During these periods, depending on their livelihood goals, and capabilities some farmers engage in nonfarm economic activities like grain trading where they buy grain from local farmers and sell it in the nearest towns of Ambo and Weliso on market days. This is popular among younger farmers who have small plots of lands to farm and hence seek to diversify their livelihood.

On the other hand their women counterparts in an attempt to diversify their livelihoods, they engage themselves in different nonfarm economic activities such as making pottery prepare and sell of local drinks, sale of processed Enset,

Plates III. Market at Yaii Chebo

(This market usually is referred as women's market)



Women on nonfarm economic activities



Table 2. Gender based seasonal calendar of activities in Yaii Chebo

Season	Sex	Activities
June to August (Ganne)	Male	<ul style="list-style-type: none"> • Land preparation (Manual digging, ploughing) • sowing • hand weeding (only to the lower parts of the PA) • harvesting potatoes and transporting • Livestock management • Attending any social events
	Female	<ul style="list-style-type: none"> • Land preparation (land clearing for ploughing, digging the parts of the land where oxen do not reach using axe) • Prepare food and drinks when there is dado or sheni • Going to market to buy and sell everything that is required for daily needs of the household • Managing and manuring Enset farm yards • Managing livestock • Attending any social events
September to November (Birra)	Male	<ul style="list-style-type: none"> • Weeding (only to the farmers at the lower end of the PA) • Livestock management • Taking care of tree plantations (if available) • Attending important social events • Going to market to buy clothes and very important things for the household • Fencing of compounds • Land preparation (manual digging) of fallow land
	Female	<ul style="list-style-type: none"> • Enset processing • Livestock management • Weeding (only to the farmers at the lower end of the PA) • Attending social events

		<ul style="list-style-type: none"> • Going to market to sell or buy daily needs of the household
December to February (Bonne)	Male	<ul style="list-style-type: none"> • Harvesting • Threshing • Sell of crops to pay fertilizer debts • Buy clothes and important things for children (if there is surplus) • Attending social events • Engaging in nonfarm activities like grain trading
	Female	<ul style="list-style-type: none"> • Uprooting legume crops • Preparing food and drinks to the field of threshing • Transporting grain to storage • Sell grain in small amounts to buy good items for daily needs of the household
March to May (Arfasa)	Male	<ul style="list-style-type: none"> • Land preparation at the onset of Arfasa rain • Planting potatoes • Managing soil conservation structures (terraces)
	Female	<ul style="list-style-type: none"> • Enset processing • Manuring enset yards and management • Land preparation at the field using hoe

CHAPTER FIVE

Local people's perception about soil erosion and existing knowledge and attitude on soil conservation practices

5.1. The Physical environment in perspective

Under conditions of subsistence farming system, it is obvious that farm households depend heavily on the exploitation of natural resources for the production of their basic needs such as food, energy, and building materials. In this process, the major natural resource is the land itself which is being farmed, grazed, and logged (Daniel, 1988).

As it was mentioned earlier, Yaii Chebo is characterized by a topography that is very steep and rugged. Based on unpublished project document prepared by Ambo wereda agricultural and rural development bureau, according to slope classes, 62% of the land has steep slopes of more than 15% where as 38% of the land is characterized by gentle and moderate slope. This merely suggests that the PKA is prone to land degradation in the form of soil erosion without adding any other factors. Although the topography plays the major role, there are interrelated factors which facilitated land degradation in the form of soil erosion more than ever.

The livelihood of the farmers is mainly shaped and guided by the altitude of the PKA. And according to Daniel (1988), altitude is perhaps the most important factor in the environment which determines not only climate and other natural processes but also land use, agricultural practices and the types of crops grown. This means that the altitude of the PKA geared farmers to adapt a way of livelihood that fits to the setting they live in. Hence, the application of ecosystem concept where by the interaction between the environment and people in the PKA resulted in the shaping of

one another, whereby farmers in the area have developed their own adaptive strategies to manage their lives in such kind of environment.

Moreover, due to the high population pressure, crop cultivation has encroached into areas which were once used to be forest lands and to steep slopes, leading to deforestation on the way. Fallowing has been one of the most prominent farming adaptation strategies among the farmers of Yaii Chebo for many years. But now due to the increasing population in the area, land become so scarce, which makes it impossible to use fallowing. It means that land use has become more intensive and fallowing becomes rare. To make things even worse, now the number of landless households is going so high up, which leads to clearing of the already scattered remained forest lands, farming of steep slopes and use of lands very close to river banks.

As there is no other means of livelihood diversification in the area, farmers entirely depend on the natural resources for their survival. This continuous interaction between the environment and farmers facilitated the degradation of the land which in turn threatened the survival of many lives depending on it. Land gets scarce and the available land is also failing to meet the needs of the increasing population in the area and the needs of newly established households.

5.2. Local people's perception of soil erosion

Understanding local people's perception of their environment in general and soil erosion in particular is a key for any development intervention related with natural resource management. Why farmers perceive their environment and soil erosion problems in a certain way, why they behave towards the environment the way they do should always be a starting point to fully understand the interaction between the environment and human beings, farmers in this context.

Perception refers to individuals or group's evaluation of or awareness to the processes of change in the environment the individual or the group is living as well as their understanding of soil erosion problems (Found, 1974). The farmer's perception of the environment is either developed through the constant interaction with the environment in a life time or value transferred from generation to generation.

For the duration of the study in the area, intensive key informant interviews, focus group discussions and questionnaires were used to have a thorough understanding of how the local people perceive or evaluate their environment and the ongoing soil erosion problems the way they do. Historical accounts were of a paramount importance to explain the multitudes of changes that are taking place in the environment. Environment includes the set of interrelated physical and social factors existing in the Yaii Chebo including; relief, rainfall patterns, land use and social cultural and economic interaction of the people with the environment, and vegetation or forest cover. Hence, perception is such a fluid concept to visualize; local people's perception is explained in terms of understanding farmers' opinions about the changes in the different environmental elements mainly the soil. Farmers interact with the environment on daily basis and are alert on any changes in the environment. As a result they always adapt their lives according to their existing situation. Thus, understanding how farmers realize the changes in their environment would indirectly mean understanding their perception towards soil erosion problems and also their shift in perception as a result of the dynamics of the changes that are happening in their surrounding environment.

Topography or altitude: is obviously the starting point in Yaii Chebo. Farmers believe that, had it not been to the extreme steep slope of the PKA, their environment would have been in a better position with much lesser land degradation and better productivity. However, since the

farmers have not been seen living in a different environment than this one, what they say could not be proved and held accounted. Yet even though altitude, coupled with other factors, aggravates land degradation in the form of soil erosion, it cannot be accounted as the only cause for soil erosion problems. Based on the data collected through questionnaires, more than 98% of the farmers perceive that topography plays a central role in determining their farming activities.

Rainfall pattern: Based on the data from key informants, Yaii Chebo used to feature extreme amount of rainfall. Three to four decades ago, rain used to rain nonstop all day long. As they said it in their own words during focus group discussion:

It used to rain so heavy and would not stop even in 2 days time. We used to sow our crops in the mid of May as it was impossible to sow in June due to the heavy and nonstop rain. If a farmer was late to sow in May then that means he would spend the rest of the year with no crops as it was impossible to sow in June given the extreme heavy rain. But now the rainfall pattern has changed so fast that we are having uncertain raining seasons and shortage of rainfall. We sow our crops as soon as it rains, mostly in June this time and the uncertainty is so high. We were so sure about the raining season before, but not anymore. Rain comes uncertainly and is so erratic. In recent years, the arfasa rain is becoming too small and reduced to duration of only one month. For instance last year, there was no rain in May, it rained late in June. As a result of the change in the rainfall amount and timing, we are forced to delay our land preparation and sowing periods. It is a challenge that we are facing now that we have to coincide our farming activities with the erratic rainfall.

Farmers associate the cause for erratic rainfall pattern to the clearing of forests in the PA. As they told me, 25 and 30 years ago there were dense natural forests and manmade plantations. However, after the fall of the Derg military regime and the high population growth in the area, people started clearing forests in search of farm land as well as to sale logs to the nearest towns. The forest has been cleared of the land in one-generation time span. This finally resulted in the change of what used to be forest areas into farm lands.

Farmers in Yaii Chebo are fully aware of the threat that is posed on their lives by the changing environment and the continuous loss of soil that is being washed away from their lands year after year by runoff. When asked how aware they are of land degradation in their PA, they have mentioned indirect symptoms which they had observed through time. These include, increase in the intensity of flood on their farm lands, uncertain rainfall pattern which is also less in its amount, expansion of crop lands to what used to be forest and grazing lands, fallowing practice has been abandoned, high population pressure putting the land under a lot of pressure beyond its carrying capacity, increased rate of soil erosion from high hill slopes due to removal of vegetative cover, the increase in the number of gullies formed in the PKA.

Data collected through questionnaires using a three level Likert perception scale have shown that, given the topography of the PKA, most of the farmers are well informed about the causes of soil erosion and its effects. Farmers express the problem by giving account of the symptoms of soil erosion. Farmers are well aware that they highly depend on the land, hence the soil, for their survival, thus there is awareness among farmers that it is a threat to their farming practice. Farmers are also well aware of the interrelated causes of soil erosion problem, giving high account to the topography and population pressure, which in turn led to clearing of forest land.

It is understood that farmers are well aware of the changes in their environment and the problems of soil erosion. Level of awareness varies among farmers according to age, educational level, farming experience, land tenure, and location of farm land in the PKA. Most farmers (63%) believe that Yaii Chebo is not convenient for farming, out of which 73% are younger farmers who are in their early 30s and late 20s. Hence, Younger farmers, given the situations, would consider resettlement to a different location with more flat farm lands. One of the main reasons for this is that younger farmers, who do not have a direct ownership to land, unless not inherited, are struggling to make a living and insure the survival of their household members. Life takes the toil out of them as they are expected to produce in very small plots of land, mostly rented land, and feed their household members. The other reason could be that some of the farmers have gone through the formal educational system but failed to succeed after taking the final national exam at grade 10. As staying in a town with no further education and lack of relatives is difficult, these former students usually come back to their village to start life from scratch as farmers. Thus, they always think they would do better farming in a different environment than the one they are living in. Unlike the other members of the community who have stayed in the PKA for many years, these youth have a different mentality towards life in general. Be it due to the lack of farm resources or their previous education and interaction to the town, they are the pioneers in terms of trying out new ways of livelihood diversification; such as grain trade during off seasons.

However, older farmers believe that the PKA is convenient for farming. This is mainly associated with the fact that most of the land in the PKA is under the ownership of few older farmers, most of whom have access to large plots of lands which were once belonged to their land lords before the 'land to the tiller' proclamation of 1975. Those farmers appreciate the status quo and issues of relocation or resettlement are shocks to them.

Unlike their younger counterparts, older farmers would not consider resettlement to a different location as it looks impossible to them to start life from scratch given their age. The older farmers also have worries that moving away from this area would mean losing their social networks which has been as old as their ages.

On top of that the older farmers are still nostalgic about the *gabarro* tradition and culture; such as the *boku*, which has been now abandoned due to the rise of protestant religion in the PKA. Hence, for the older farmers, living in the PKA regardless of the environmental changes is a matter of keeping identity. Whereas for the young and resource poor, mostly protestant farmers all these things are nothing but past history which does not add value to their currently changing and demanding environment. The protestant religion has changed the whole cosmology of the young farmers regarding the past *gabaro* traditions putting the *gabarro* elders and the protestant youth at odds.

Case 2: *In the gabarro tradition the power of the aba boku is hereditary passing to the eldest son. The current active aba boku was one of my key informants and he has a son, who supposedly would inherit the position of aba boku had he not been a protestant. This is how the old tradition is being cut off from the existing livelihood adaptation of the community. The aba boku blames it all on protestant religion for the fall of the boku, while his son on the other hand has no intention or interest of whatsoever in the boku defending his new religion. At some instances the father and son had made the interview sessions difficult due to the tensions they have between themselves as a result of their differences.*

This was just a portrait of existing paradox among family members living in the same compound. Yet it is a manifestation of the existing dynamics in the livelihood adaptations of the PKA.

It was also noted that the more a farmer stayed farming for many years, the higher is the perception about the changes in the environment. Farmers have been doing farm activities for many years without keeping any records. Each farm activity is done through experience or through learning from their forefathers, hence the more a farmer stayed in farming the more is the awareness about the changes in the environment.

For most farmers living in such kind of environment is a matter of fate whereby they can do nothing to change it even if they want to. There is a high level of perception among the farmers that the major cause of erosion in the PKA is the topography itself; hence around 73% of farmers consider it as a matter of fate. For this group of farmers, soil erosion is inevitable if a community is living in such kind of steep slopes. This kind of viewing the environment is common among older farmers who have lived in the PKA all their lives. The rest 17.7%, most of whom younger farmers, even though they agree that the topography facilitated soil erosion, they still do not agree with the fact that soil erosion is being considered as a fate along with living in such kind of environment. This variation in perception could be as a result of the differences in the world view of farmers caused by the conversion to Protestantism. It was so obvious that the protestant farmers are more progressive in planning their livelihood strategies.

Case 3: *Obbo Chala Ensermu is a 29 year old farmer with a wife and five children. He owns one hectare of land and since the land is not enough to feed his whole family he takes land on contractual basis from his brother, who has moved away from the PA for a better life in Ambo town. Chala describes his livelihood by classifying it before and after six years ago. Before*

six years I was just a regular farmer who spends a lot of money from crop sale on drinking and booth. I never made plans nor take responsibilities for the future of my family. Since six years I converted to protestant religion and now consider myself a completely different farmer. I make plans for every farm practice. What to produce, when to sell crops, how much to save for emergency, social occasions and for saving is all planned. Now, I do not spend a single penny on drinks. My livelihood has changed and improved by far than what it used to be six years ago. In general, we, protestant farmers are getting smarter in making plans on our farm produces and general livelihoods; most of us are motivated with the change we have seen in our lives'.

On the other hand, as a result of the training farmers obtained from the GTZ-SUN Oromia project, there is a high level of awareness on the issues of land use practices. Hence based on the data collected through questionnaires, around 93% believe that inappropriate land use practices cause soil erosion. In addition to that, during all the six focus group discussions that were held, farmers have expressed how well aware they are about their land use. After the trainings, they have started to categorize their lands into specific uses based on the location and slope of the land. Depending on total amount of land ownership, farmers try to categorize their land into farming, grazing and forest. In the resource rich households, the distinction is clear as land is classified according to its purpose. Where as in resource poor households, there could only be farming and no plot of land left to be allocated for other purposes. Farmers also know that the land areas near river banks and extreme slopes should not be ploughed as the soil will be eroded during run off. Due to the shortage of farm land in the area, farmers have adapted to combine forest and grazing lands so that animals graze in between trees in forests. In the absence of forest plantations, farmers grow grasses on terrace bunds.

Since all the remaining forest lands and manmade plantations are under private ownership, it was possible to combine the grazing land to it.

Farmers' perception of environmental changes and soil erosion problems also showed variation based on the specific location of farm land. Farmers who reside on the higher altitude of the PKA have experienced a lot of changes in their farm land as the land is so steep sloped the probability of soil erosion is so high. These farmers are more vulnerable to land degradation in the form of soil erosion; hence they are alert in changes. For instance, during my focus group discussion session in the higher altitude, farmers were showing me how variable the nature of their soil is in every few meters distance. They observe how thin their soil is getting through time due to land degradation. This tells how they are on alert on changes in their environment. Whereas the farmers living on the lower altitude have relative advantage over the ones living at the high end of the PA since the topography features gentle slopes.

Farmers are aware that soil erosion is a threat to their farming livelihood, because of which agricultural productivity is reduced, further causing shortage of food at the household level. Farmers also are aware that problem of soil erosion can be minimized through the construction of terraces in their fields, which has a positive relation to the adoption of soil conservation structures and practices.

5.3. Soil Conservation practices in Yaii Chebo

5.3.1. Indigenous soil conservation practices

Indigenous soil conservation practices are those practices or ideas which have either been generated locally or introduced and then transformed and incorporated in the ways of life of the local people (Yohannes, 2000).

Farmers at Yaii Chebo have indigenous soil conservation practices in an attempt to conserve the already eroded soil from further loss. Contour ploughing, digging draining trenches above the farm field, leaving grass strips along farm borders, crop rotation, fallowing (although it has been abandoned now due to land shortage), planting trees at the borders of farm lands are some of the traditionally performed soil conservation measures in the area.

Contour ploughing: depending on the slope of their land, farmers plough along contour lines and make deeper furrows every few meters so that the runoff water could be held in the soil without causing any damage.

Digging draining trenches above farm fields: this is practiced among farmers to avoid the inlet of any running water into the farm field, hence diverting the direction of flood.

Crop rotation: is one other method used by farmers as a means of conserving soil. Farmers are aware that legume crops like beans, peas and lentil make the soil more fertile for a next year production; hence they rotate these crops with barley and wheat. This is more of accounted in making up of the already loss in the fertility of the soil as a result of recurrent soil erosion.

Fallowing: Farmers have been using fallowing since many years. However, the practice of fallowing show a reducing trend recently as land becomes so scarce in Yaii Chebo with the growing population. Farmers who are living on the higher end of the PA plough farm lands which are

more steep slopes than the ones at the lower end of the PKA and that made them more vulnerable to soil erosion problem. As a result they practice fallowing more than the rest of the farmers who reside on the lower altitudes. As they mentioned it to me the nature of the soil in their area is quite different from the ones at the lower end, an already damaged thin soil which cannot be ploughed every year. However, with the increasing population number in the area, there is not enough land left to be left unploughed. Hence, they are now forced to plough their plots on successive years, which resulted in low yield and at times even no yield at all, only the crop stalks and leaves. Due to all these factors farmers are left with the only option of using chemical fertilizers and are becoming more dependent on chemical fertilizers more than ever. However, the increasing trend in the cost of fertilizer always poses a threat to farmers.

Farmers also plant trees along farm borders in an attempt to withhold the runoff water that causes soil erosion. Other than these, farmers also use manuring especially homestead and Enset lands, burn the soil so that the crop residues on the plot of land decompose to rejuvenate the soil.

5.3.2. Government and NGO initiated Soil Conservation interventions in Yaii Chebo

Conservation based development refers to the wise use of land resources to assure sustained and continuous productivity of the land (Daniel, 1988). This does not mean the no use of land resources since land has to be used more efficiently to increase agricultural production and meet the needs of the growing population.

In view of this, there have been different efforts of conservation interventions in Yaii Chebo at different phases. The interventions mainly focused on creating awareness among farmers on proper land use practices, the introduction and construction of hill side terraces on steep

slopes to minimize the effects of soil erosion on the lives of many households.

Initially, interventions with the theme of soil conservation came to the picture in the PKA eleven years ago around 1999. It started as a government funded initiative and implemented through Ambo wereda agricultural and rural development bureau. By then, the project focused on providing farmers with information and raising awareness about causes of land degradation in the form of soil erosion and construction of soil conservation structures such as terraces. Based on the interview held with a wereda expert who was part of the first conservation initiative in the area and who is now also serving as the contact person for the GTZ-SUN Oromia project, at the beginning the level of awareness was too low among farmers regarding conservation practices. According to the expert, farmers were not aware of terraces as conservation methods for soil conservation and also they were not informed about land use practices. During the focus group discussions held in the PKA, farmers have confirmed that they become aware about the advantages of terracing after the interventions.

Construction of terraces started on the higher end of the PKA which constitutes the steepest slopes. This conservation based development intervention was implemented on the basis of incentives whereby a farmer was paid cash for digging terrace bunds on his own farm land. Since constructing terrace reduces the size of the farm plot as well as the failure of conservation technologies to provide an immediate benefit to farmers, there was reluctance from the farmers' side to dig parts of their plots for the sake of conserving the soil regardless of its benefits. They use to get paid 5 Birr for digging a 10 meter long and 1 meter deep furrow. Farmers other than the land owner were also hired to construct terraces. According to the contact person, during this phase of the conservation based development intervention, the volume of work covered in this way was bigger than the phase with community participation.

The next phase of conservation based development intervention in the PKA was funded by the German Technical Cooperation (GTZ) and started in 2001 under the theme of sustainable land use planning. Similar to the first phase of intervention, this one also focused on awareness creation and training activities. During this time incentives were shifted from cash to materials such as farm implements and seedlings for homestead plantations. Farmers were being provided with all the necessary farm implements that are used to construct terraces as well as for farm works, homestead seedlings, apple seedlings, and seeds for different vegetables. This phase based its success on community participation and involvement. Farmers' participation was given priority during the Participatory rural appraisal (PRA), which was used to identify their problems.

After two years, in 2003, the project has transformed into 'Goromti watershed' with a new fund from GTZ-SUN Oromia-KFW wing. During this period, instead of dealing with patchworks of conservation practices, a shift has been made into catchments, concentrating on watershed management. The catchment constitutes most part of Yaii Chebo peasant association, and few parts of the neighboring peasant association. 246 households from Yaii Chebo are covered under the watershed, out of which 40% of the households are landless. This phase of the conservation intervention excluded households or parts of Yaii Chebo which were addressed during the first and the second phase. Looking at the number of landless households that are being considered in the project, it gives a paradoxical implication on the success and sustainability of the project as landless farmers hardly have the feeling of full involvement in the project. Out of the total of 1221 ha of land which is covered by the project, 733ha farm land (60%) of the land is treated with conservation structures such as terraces. In other parts of the land check dams has been done to prevent the formation of gullies. According to the GTZ contact person at

Ambo wereda agricultural bureau, like the initial phase of the conservation interventions, farmers were made to participate in problem identification and prioritization at this phase of the conservation intervention. Moreover, some farmers were taken to Konso (Southern Ethiopia) to share experiences on the construction of terraces. The expert emphasized that throughout all these years of the intervention, raising awareness about soil conservation practices takes the most part.

In general in this phase of the conservation intervention, efforts are made to make farmers' participation central in the planning and implementation of the project activities. Incentives focused on farm implements, other livelihood diversification means on a subsidized price such as seedlings plantations, apple seedlings, provision of modern bee hives, improved household technologies such as fuel saving stoves, provision of vegetable seeds and seedlings for free.

In this phase of the Project, farmers were organized according to their localized neighbourhood or development stations (*Locally Gots*) and were made to work on terraces. Public holidays and weekends are mostly used for the purpose of constructing terraces. Each Got has a leader and supervision is made by the GTZ contact person in Ambo wereda agricultural bureau and the development agent at the PA.

During the focus group discussions held farmers had appreciated the incentives that were being offered for free; farm implements, the apple seedlings which have a high commercial value as well as livelihood diversification potential, and the vegetable seedlings which have also market value. During the data collection period of this study, the project was almost completed and farmers were mentioning how much they have missed the incentives they were being offered to them for constructing terraces. According to the farmers, they have been benefiting from the vegetable seedlings that were being brought by the project. They have also

mentioned the apple seedlings which according to them have a high commercial value. Yet, the farmers have sadly mentioned that they had good production of apple only 5 years ago, since then the tree is affected by a disease and the production has decreased so fast; fruits having dark spots and fruit trees dying out of the disease. Though the project was able to give farmers give trainings for farmers on the management of apple production, the disease has been a big blow to their hopes of income diversification in such changing environment.

For a conservation program to be effective, every effort must be made to develop practices which not only conserve the soil but also provide short term tangible benefits to the farmers such as incentives (Sanders, 1992). However, even though it is hardly possible to realize conservation based development interventions without incentives, the farmers at Yaii Chebo have developed a sense of dependency to the incentives that were being offered to them. This obviously puts the sustainability of the conservation intervention at a higher risk. Because once the project is completely phased out of the PA, there seems no way to keep those conservation structures intact. It looks that ownership to the conservation activities done over the years has been lost somewhere in the line. Even though the conservation structures are now mainly left to farmers' development groups (*Gere*) to maintain, construct new terraces which has been demolished by different factors, and to control those farmers who destroy the constructed terraces, there still exist farmers who destroy the terraces as there is a belief that the part of the farm field which has stayed near the terrace is fertile.

5.4. Knowledge and attitude of farmers towards Soil conservation practices

Knowledge and attitude of farmers play decisive roles in soil conservation interventions. Knowledge and attitude say a lot about farmers view regarding soil conservation practices and the consequent adoption of soil conservation practices as they have positive relations.

Knowledge relates to what the farmer knows about the cause and effects of soil erosion. In order to understand why farmers do a particular farming practice the way they do in respect to soil conservation attempts, their knowledge of soil conservation problems need to be investigated (Shaner, et.al.,1981).

Farmers' knowledge is a product of their perception towards their environment and soil erosion, the beliefs and common practices which they have gained through social interaction and the years of experiences in the farming. The focus is mainly on the farmers' knowledge of alternative soil conservation management practices (innovations), cropping patterns, and sources of information on soil conservation practices.

From the focus group discussions held in the PKA, farmers have explained what could cause soil erosion and its subsequent effects. They have agreed that the topography of the PKA coupled with increasing population pressure trigger the clearing of forests which in turn led to the increase in the severity of land degradation, hence soil erosion problems. As it has also been mentioned in earlier topic, farmers practice common knowledge, which they have gained through many years of farming, so as to conserve the soil from further loss. Moreover, from the trainings which were provided by the GTZ-SUN Oromia project farmers have become informed and equipped with the knowledge of soil conservation technologies (innovations) such as; terracing, plantations, etc.

Table 3. Farmers' knowledge on soil erosion

Knowledge of farmers	Agree		Disagree		Not sure	
		%	No	%	No	%
The possible causes of soil erosion:						
a) Population pressure	128	98.5	-	-	2	1.5
b) Deforestation	125	96.2	-	-	5	3.8
c) Rainfall	89	68.5	28	21.5	13	10
d) Run off	130	100	-	-	-	-
e) Soil type	126	96.9	-	-	4	3.1
f) Inappropriate land use practices	123	94.6	-	-	7	5.4
Steep slope farms are prone to soil erosion and erode faster than gentle slope farms	130	100	-	-	-	-
We say the soil is eroded when crop productivity declines over successive years	125	96.2	3	2.3	2	1.5
We know the soil is eroded when the soil is unable to grow crops which it formerly grows	125	96.2	3	2.3	2	1.5
Soil is eroded if the farm field needs more input (such as fertilizer) than previous years	129	99.2	-	-	1	0.8
Inappropriate land use practices result in soil erosion	123	94.6	-	-	7	5.4
Thin soil can be eroded by wind and run off faster than thick/fertile soils	128	98.5	-	-	2	1.5
Soil erosion is severe in the higher altitude of the our PA than the lower altitude	130	100	-	-	-	-
Soil conservation structures such as terraces retain water in the farm field	130	100	-	-	-	-

Field Survey: February 2009

Based on data collected through questionnaire, most farmers seem to emphasize the root causes of soil erosion such as population pressure, topography and deforestation than the immediate causes (like rainfall and runoff). In every discussion and interaction I had during the data collection stage of this study, farmers always refer to the topography and

altitude of their physical environment as the triggering point for soil erosion. And population pressure comes next which in turn according to farmers have caused clearing of forests.

From their many years of experience on farming farmers also know which soil type and which kind of slopes are more prone to erosion than the other. Hence, it was obvious that farmers who live on the top end of the PKA are affected by erosion tremendously than the farmers living in the lower part. Through their experience farmers have also identified symptoms of soil erosion in their farming practices such as the decline in crop yield in successive years, the amount of farm input, mainly fertilizer, the land requires year to year, when the soil gets weak in its density and becomes thin. Nowadays farmers reached the level where they can never try of growing crops without the use of chemical fertilizers, whose price is increasing every year putting farmers in a difficult position. Alternatives such as compost and manure are well recognized by the farmers but are not practical for farmers unless for the land near homesteads. One of the reasons in that farm lands are located in a far distance than the house, hence transporting compost or manure would require more resource such as pack animals or human labour both of which are not existing in most farm households unless in very few resource rich farmers. On the other hand preparing compost and manure for a bigger farm land would require lots of input as well as takes out lots of time of farmers which would have been invested in other farming activities, hence not practical. Moreover, with the dwindling cattle production in the PKA it is hardly possible to get animal dung which could manure large plots of farm lands.

In addition to that most young and resource poor farmers do not have ownership of land in the PKA, which makes them depend mainly on rented land for their farming activity. Hence, according to these farmers, no one is motivated to put an effort to naturally fertilize or even conserve the soil. The resource rich farmers rent out parts of their land which are infertile

and located in steep slopes. All farmers who use rented lands do not want to have any long term investment in such lands as natural fertilizers are usually applied to the soil in order to make it rejuvenate and recover for the coming production years as well. In such cases it is not motivating for them to invest on a land they are not certain of ploughing the next year.

Most farmers know that inappropriate land use practices result in soil erosion problems. They know that digging or ploughing very steep slopes which are near river banks aggravate soil erosion. They also know that those kinds of areas should be covered with forest trees instead of being ploughed. Although farmers tell me the fact that they know the proper land use practices, however, in reality from what I have observed in my own eyes farmers are digging those extreme steep slopes manually (as it is impossible to use oxen ploughing) to change them to farm lands. These kinds of land parts were not suppose to be put under cultivation. The general impression seems that they are digging such lands without being seen by the development agents or some community leaders, but once they are dug then no one seems to ask them. This neither show the lack of knowledge nor ignorance of the farmers on the risks of cultivating such kinds of marginal lands as they clearly know the stakes. Yet for these farmers keeping the survival of their family is an immediate priority. The farmer's subsistence is priority number one and whatever else a farmer could do about conservation and land use deals with minimizing the risks of soil erosion problems. Regardless of what they have been trained or what they know about land use, they put survival in front. Thus it seems at the end of the day what matters most is not what an appropriate land use practice is but what farmers think is best for their existing situation, and in this case is making sure the continuing survival of the family. Had the farmers been offered alternative livelihood sources, the picture could have been a lot more different. Farmers, out of lack of choice, do things

which might look inappropriate on the eyes of the development agents or the project expert.

During one of my observation period, I have come across group of farmers working under dado manually digging a new (virgin) land near a river bank to change it to a farm land for one of their newly married friend. They had stopped working for a while assuming that I would report them to the GTZ contact person or PA administration. They told me that they know such kinds of lands are not for farming. But yet, with no alternative available for the newly married youth in the area, they concentrate on today's survival more than tomorrow's.

Thus, it clearly indicates that creating awareness among farmers about soil erosion and land use practices or knowledge about soil erosion problems cannot be a guarantee for the success of conservation based development interventions as farmers' actions are guided by the rapidly changing social and physical environment not by the conservation scheme per se. The ways they view their situation always balance out other factors. Farmers place more emphasis on short-term planning which puts the issues of sustainability of conservation practices into question.

Attitude on the other hand refers to the farmers' feelings, emotions and sentiments about conservation based development practices. Hence attitude has a strong influence over the decision of farmers to accept or reject soil conservation practices (Shaner, 1981).

Attitude of farmers towards soil conservation practices is the resultant effect of perception and knowledge of farmers about soil erosion and the processes of environmental changes associated with it (Bahru Shikur, 1993).

In other words, farmers' attitudes towards soil conservation practices have strong influence on their decisions regarding the adoption, implementation and further sustainability of the conservation practices.

It was noted that most farmers have relatively positive attitude towards conservation practices such as terracing, proper land use practices and seedling plantations.

Farmers seem to agree on the fact that conservation practices are responsibilities of the community as a whole. There is a tendency among farmers to believe in group soil conservation practices than individual efforts, though individual efforts have also been emphasized in soil conservation practices. This way of viewing soil conservation practices could be due to the nature of the different phases of soil conservation interventions in the PKA, which seemed to target the farmers as a group in the community but not as individuals. Thus, it was noted that individual farmers accept particular new practice once making sure that it has been accepted by the whole community.

Furthermore, because of the topography, a farmer could be ploughing a plot which is on a lower slope and if run off is not been held from the farm plot of the neighboring farmer whose farm is located on the steeper slope, then the mere fact of constructing a terrace only on the individual farmers' could be just futile effort. The soil conservation action (mainly terracing) of an individual farmer could negatively affect the neighboring farmer. Hence as a result farmers are not encouraged to practice conservation practices individually but in groups. However, the tendency of thinking conservation in groups is having unwanted consequences in the conservation activities; the reason being that not all farmers are equally concerned about soil conservation problems. Due to diversities in the household strategies and goals as well as priorities, farmers do not have equal concerns.

All farmers agree with the fact that the construction of soil conservation structures such as terraces increase crop productivity. As the soil which was used to be eroded by runoff is held tied with terraces, there is a possibility of having a better yield. As farmers mentioned it to me during focus group discussions:

Barley is our important cereal crop here. We used to harvest 5 Quintals of grain from a hectare of land before the construction of terraces begin in the PA, but now we have started to gain double what we used to produce.

Although the soil has been highly affected by erosion already, the intervention helped to rejuvenate the fertility of the soil. But still farmers feel that they lost their soil already. Considering the topography they are living in, farmers do not consider the fact that soil erosion problem can be stopped completely. They agree that the effects of soil erosion can be minimized to sustain the lives of their household members. From the attitude index it was also noted that farmers seem to give high priority on their short term goals when they conserve the soil. They conserve the soil to keep their immediate survival than considering the coming generation. This is because farmers feel that the soil has already lost its fertility long ago before the soil conservation schemes had begun. Hence, whatever conservation measure they do is to make sure the present generation survive. So it is rational from farmers' side to focus on short term subsistence.

Farmers have rejected the supposition that the incentives are the driving forces in their involvement of soil conservation measures. This could one of the cases where farmers provide answers that they think the interviewer might like to hear. This is because, during focus group discussions and informal discussions farmers were discouraged because there are no more incentives from the project as it gets to the end of it. To some extents the

incentives have even made farmers dependent and always expect it. On the other hand, farmers have fully accepted the supposition that they will continue maintaining and taking care of the soil conservation structures if incentives are being given to them. This shows that if conservation programs are to be effective, every effort must be made to develop practices which not only conserve the soil but also provide short term, tangible benefits to the farmers.

One of the major factors which influences farmers' attitude towards soil conservation structures such as terraces is the fact that it reduces the size of the farm land. As it is known terraces are constructed every 20 meters on the land depending on the steepness of the slope, which means a farmer could have many of them in his farm land reducing its size. In Yaii Chebo distance between terraces has been defined on the local context based on the size of land a farmer own and steepness of the slope. Farmers have agreed that terracing takes land out of production; land which would have been used to fulfill the food and income requirements of household. And this is a big issue for farmers with small plots of land. More than 87% of the farmers believe that terracing takes land out of production, out of which 96.5% are farmers with a land holding size of 1 to 2 hectares. The fact that terracing increases crop productivity does not cancel out farmers' concerns of it reducing the size of the farm. It is always challenging to understand how farmers assess and compare the increase in productivity as a result of terraces and the land that was kept out of production because of the terrace. For farmers, loss of land due to soil conservation structures is a high concern more than anything else.

One would assume that the soil conservation structures could create inconveniencies during ploughing as it is difficult during turning oxen. However, in Yaii Chebo it is a different scenario as farmers manually dig with their digging stick the part of the land which is so steep. Hence terracing has not created any inconveniency in their ways of ploughing.

One of the indirect and major benefits of terracing which was mentioned several times by farmers was that their cattle could feed on the raised ditches of terraces. Due to the high population pressure forest and grazing land has been changed into a farm land in Yaii Chebo. This had resulted in the shrinking of the size of livestock. Farmers were forced to adapt the type of livestock they should have as well as the number since there is not enough feed for keeping as many of them as possible. Thus, the construction of terraces helped as an alternative to grow grasses on them so that cattle could be fed on.

5.5. Adoption of Soil conservation practices in Yaii Chebo

Adoption refers to the full scale integration of soil conservation practices by farmers into the ongoing farm operation of the farmers (Lionberger, 1960). This starts from the construction of soil conservation structures and plantation of different seedlings up to the maintenance and integration of those practices into the regular farming system.

The decision to adopt usually takes time. Farmers usually do not adopt new conservation practices such as terraces or new ideas as soon as they hear about it. They may wait for several years before trying the idea for the first time, and longer still before permanently integrating and incorporating it in the regular farming activity (Rogers and Shoemaker, 1971). The decision to adopt are classified into four; voluntary or optional adoption, adoption by directives, adoption by coercion, and group adoption. Due to the variation in the approaches followed in all the different phases of conservation interventions in Yaii Chebo, it is hardly possible to put a category on the class of adoption. Yet, voluntary or optional adoption and group adoption are most prominent. There are few incidents of adoption by directives especially during the government funded conservation schemes.

As it is explained in a FAO document, throughout the history of conservation interventions in Ethiopia, most of the interventions were funded by the government. Hence, soil conservation structures were constructed on croplands without giving the needed time for the farmers' decision making in the adoption process (FAO, 1986).

This holds true in Yaii Chebo especially during the first phases of the conservation based development interventions. Farmers did not have the time to go through all the different stages of adoption processes (awareness, interest, evaluation, trial, adoption). And conservation based development interventions in the PKA were initially started without giving farmers the time to assess the advantages and disadvantages of the conservation interventions.

On the other hand, the decision to adopt a particular conservation practices mainly depend on the knowledge, attitude and perception of farmers towards the particular conservation practice.

During the different phases of the conservation based development interventions in Yaii Chebo, the farm fields of most farmers are covered with terraces and the required conservation structures. As it was also understood from the GTZ-SUN Oromia contact person in Ambo wereda agricultural and rural development bureau, more than 60% of the farm land is covered with conservation structures. The remaining farm land is also expected to be treated with community participation in a sooner time.

Hence, speaking of adoption in this study does not only refer to farmers' construction of terraces on their farm lands per se, which has been done already with or without their interests. But adoption in the study is also to mean the maintenance, long term sustainability and ownership of the conservation structures which had been implemented in the farmers' fields since 10 years now.

The decision making process of farmers involves a range of factors that are taken into account. Each farmer usually makes choices within the context of the household and is influenced by the household's needs and goals as well as by the resources available to the household (Barlett, 1980). Hence, it was observed that farmers' decision to adopt conservation practices is a function of several factors. Social factors such as locality groups, family and social clique, cultural factors like values and attitudes, economic factors such as cost and profit gains, personal factors such as age, education and psychological characteristics, and situational factors such as farm income, size of farm, tenure status, sources of farm information used are among the decisive factors for farmers whether to adopt conservation practices and keep them maintaining as their own.

If soil conservation measures are to be adopted, implemented and be given the stabilizing care they need a considerable time, they shall be owned by the farming community. To be owned, the measures must fit into the existing farming systems of the area. Moreover, socio-cultural as well as economical acceptability should be there (Bahru, 1993).

5.5.1. Contributing Factors in the adoption process

One of the primary things in conservation based development interventions is that the way the farmers perceive the soil conservation practices. It is when farmers perceive the need for change from the traditional practice that successful adoption of conservation practices realized.

Knowledge, attitude and Perception: The knowledge, attitude and perception of farmers are results of their exposure to the environment, social networks and long years of unrecorded farm experience. These shape the way farmers perceive and think about conservation practices.

As it has been discussed in an earlier section, farmers are fully aware of the soil erosion problem in their living environment. Yet they use practices

that degrade land resources; for instance ploughing river banks, farming extreme steep slopes and turning forest lands into farm lands. Farmers in Yaii Chebo also possess favorable attitudes toward soil conservation and have the knowledge required to prevent or minimize soil erosion from occurring.

However, since the conservation based development interventions in Yaii Chebo has emphasized on awareness creation programs to bring about adoption of soil conservation practices, it is not enough to solve soil erosion problem in the area. Providing information to the farmers in order to create awareness on soil erosion problems and conservation practices is necessary but not a sufficient condition to bring about the adoption of conservation practices. During the data collection stage of this study I have observed plenty of incidents whereby farmers burn forests near river banks in an attempt to change it to farm land, dig manually steep slopes which are not suppose to be cultivated. The farmers know what they are doing; they are well aware that it is not appropriate to do such things. But most farmers give priority to productivity to meet the food demand of the family and increase income. Farmers in Yaii Chebo have constantly deal with series of changing problems as they struggle to earn reasonable produce and income, feed and clothe their families, pay off their fertilizer debts and send their children to school. In other words, farmers put the priority of their households up front more than anything else.

Some farmers also destroy terraces constructed on their farm land in an attempt to plough part of the soil which has stayed on terrace. They are tempted with the rejuvenation and hence fertility of the soil on the terrace. With the alarmingly increasing cost of fertilizer, farmers consider ploughing the fertile part of the soil which had stayed as terrace. Farmers do this not because they are irrational, but rather keeping their survival intact.

Economic incentives are useful means of facilitating adoption of conservation practices, but provision must be made to encourage the continued use of the practices once they are on the land. Programs should not be terminated after adoption has occurred (Lovejoy, 1986). Incentives had contributed a lot in the adoption of conservation interventions in Yaii Chebo. However, due to the lack of uniformity in the approaches for provision of incentives and inconsistency of the implementation, farmers have a mixed sentiment. Initially there was cash incentive, and then changed to material incentive which later was stopped with no specific reason. This non uniform ways of handling incentives created dependency on most of the farmers as the incentives had been stopped before farmers were empowered with it. On other farmers it created a sense of isolated from the matter as farmers which had been in the first phases on the intervention are not being considered in the current conservation scheme.

Farmers had high hopes with the apple seedlings as ways of diversifying their livelihood as well as a good source of income, but after one year production the fruit tree was affected by disease which has spread in every farmer's field. The vegetable seeds which now have been stopped from being provided were also good sources of income, yet they were stopped before teaching the farmers how to produce them on their own. The farm implements seem to be the remaining assets which have the significance to neither diversify the lives of the farmers nor raise household income other than support.

Land tenure and land holding size: as land is the basic resource, access to land as well as size of land matter on farmers' decision to adopt conservation measures. As discussed in earlier section, the number of landless households is getting high every year. These households have access to land mainly through renting. Hence, it is not rational for a farmer to invest any kind of conservation practices on a rented land. On the other hand farmers with small land holding size are not motivated to

adopt or construct conservation structures on the already small plot of land. The soil conservation practices take considerable land out of production and this is greatly felt by farmers who own small plots of land. The conservation scheme in Yaii Chebo involves several landless households; hence unless livelihood diversifying alternatives are met for them there could be frustrations from the farmers' side; which affects the outcome of the intervention.

Social networks: As it was noted new farm information and practice flows through neighbourhood, social clique and friendship. Personal relationships of farmers with development agents or the GTZ-SUN Oromia contact person plays a significant role in the adoption of conservation practices. For instance, most farmers would like to hear what the contact person tell them to do regarding conservation practices, but few farmers which have conflict history with the person are not willing to do anything with him. It is worth to mention the fact that farmers destroyed terraces which were built by community cooperation on their farm field only because they had a conflict with the contact person.

In general farmers have accepted and constructed the soil conservation structures, i.e. terraces, on their cropland. But most of the structures have not been properly maintained, and unless they are maintained regularly the main objective of terrace development cannot be realized. Since the donor agency would not be expected to stay many years in the PKA, wereda agricultural bureaus as well as local development offices should link the gap that exist in the follow up of the soil conservation practices. From what I have observed no one seems to own the conservation structures, not even the farmers. This a high threat on the sustainability of the structures and all the conservation efforts done over years.

CHAPTER SIX:

INTERACTIONS OF ACTORS IN CONSERVATION PRACTICES

6.1. Identifying Strategic Groups

The interaction of local and external institutional actors (strategic groups) at different levels is a central platform for the soil conservation based development interventions implemented in Yaii Chebo. These strategic groups were formed when new resources, in this case development funds, conservation technologies and the incentives associated, become available as a result of social change. The concept of strategic groups is embedded in the paradigm of power (Evers and Gerke, 2005). Power relations, conflicts of interests and social networking are the major themes that arise as the different strategic groups interact on the soil conservation platform. During my field work among the major strategic groups identified include; farmers (land owners versus the landless, female headed households versus male headed households, those who have access to information versus those who lack conservation information, youth Protestants versus Boku elders), PKA officials and GTZ contact person. The social networks that were created among the strategic groups as a result of the conservation schemes are hierarchically organized. This is to mean that some of strategic groups (actors) such as the GTZ contact person have the power to shape the community immensely through the conservation schemes he had the responsibility to implement.

6.2. Local informal institutions

Local informal institutions are vital in local people's adaptation to the changing environment. This is because all livelihood adaptation practices by farmers occur in institutionally rich context and the success of each adaptation depends on the arrangements of institutions for a particular adaptation. For instance depending on their resources and household

strategies, farmers use labour exchange organizations (*dado, sheni, etc*), several arrangements of access to farm resources (*share cropping, renting land*), social networks (*Golobie*) in their way of finding the best possible arrangement for their successful livelihood adaptations. In Yaii Chebo different local informal institutions reinforce several combinations of adaptation practice (discussed in chapter 4). However, there are variations in the livelihood adaptations of farmers based on their access to resources, social position and the part of the PKA where they live. This variation in turn dictates the way conservation practices are handled in the area. For instance, resource rich farmers, who mainly are older farmers and at the same time land owners, seem to be benefited from the power and high social status they gained in the PKA, which emanated from their old age as well as wealth status. This is also reflected in the conservation schemes where they have the required resource to offer; in this case land. Among the major local informal institutions include *dado, sheni, Golobie, Edir*.

These institutions in Yaii Chebo empower farmers, especially resource poor farmers, for access to resources; exchange of labour, social networking, livelihood diversifications in attempts to make livelihood adaptation practices a success. They have been effectively utilized in conservation based development interventions which has been held in the PKA for ten years now. Community groups organized based on neighbourhood or social clique has been used as tools to diffuse information on soil conservation and land use practices. Information seems to be easily accessed either from the contact person or the development agents by the resource rich farmers and male headed households. Landless farmers and female headed households have low access to resource and information. During my field work period, I have come across households which were supposedly participants of the project but with no information even on who is implementing the project. This was apparent among female headed household. This could be because the

development experts who have the knowledge about the project, in this case, development agents and the contact person, are males (could get gender biased) and feel at ease when working with men than women.

6.3. Local formal institutions

Formal institutions such as the PA administration, development agent office, and development groups (*Geres*) have significant roles in the conservation practices implemented. Particularly, the newly formed administrative structures, development groups (*geres*), are vital in terms of organizing farmers in small groups based on neighbourhood for conservation practices. Previously before the formation of *geres*, the project had organized farmers into terrace groups. Although *Geres* are newly formed by the formal administration for ease of organizing farmers for different community development activities and campaigns, the conservation based development intervention has been using *Geres* effectively since their emergence. PKA officials and development agents have a higher stake in the conservation intervention. The interaction of PKA officials and development agents with the contact person is another area whereby clash of interests existed during the implementation of the soil conservation scheme.

6.4. External Institution(s)

Although there are several external institutions working in Yaii Chebo in the areas of Micro finance and grain trading, GTZ-SUN Oromia is the only external institution which works in the issue of sustainable natural resource management. A lot of activities have been done through GTZ-SUN Oromia in collaboration with Ambo wereda agricultural rural development bureau. Land use planning, soil conservation measures such as construction of terraces, building check dams, and seedling plantations are the major activities in the project. And as incentives to encourage the participation of farmers, the project provided farmers with apple seedlings,

vegetable seedlings, farm implements, and improved household technologies (fuel saving stoves) at lower costs.

The project is represented by a contact person (expert) who is a staff of the Ambo wereda agricultural rural development bureau. This person was also leading the initial phase of conservation based development interventions in the area which was funded by the government. So literally, GTZ do not have its own staff at the project, but fund the project through the Wereda agricultural and rural development bureau. For the whole duration of the data collection period, I have observed that the contact person is a high profile figure among the farmers as he had been working with them for the last ten to eleven years. His name was being referred by the farmers whenever I raise questions related to terracing, apple seedlings, and vegetable seedlings. The contact person has seemed to be vested with all the power about the fate of the project. He is the provider of everything on the eyes of the farmers. It was made to look like, for the eyes of farmers, that without him, this project wouldn't go further. According to Jean-Pierre Olivier De Sardan, of course, there is power behind aid (Olivier de Sardan, 2005). There are even farmers with have no idea of who is funding the project. In other words there is a clear blur in the representation of the soil conservation scheme in Yaii Chebo. This was apparent among female headed households who are mostly marginalized from access to information.

Case 4: *Ade Abebech is a widow and household head who owns a small plot of land. Since there is lack of human resource (such as a male person) in her household to work on the farm, she gave her land to be ploughed by a landless farmer so that she gets two-third of the produce from the land. This has been a routine every year since the death of her husband and yet she could not help the fact that she has never got the right amount she deserves from her own land. The farmers who plough the land reduce the total yield harvested from the land before sharing it to her. She stayed powerless*

regardless of knowing it, thinking she cannot do anything or have no option. Her plot of land has been covered with terraces. When asked about who is working on soil conservation practices /terraces/ in the PKA, she named the contact person but she had no clue of where he is from or who he is working for. She has also never heard about GTZ funding a project that has enabled a terrace to be built on her farm field.

This is clearly an example where by the intervention is misrepresented and totally attached only to a single actor, in this case an individual.

6.5. Interactions among different actors in the Soil conservation scheme

The overall problem of increased land degradation in the form of soil erosion is defined differently depending on who is doing the defining (Fones-Sundell: 1992). From farmers' point of view, the problem is one of minimizing risk, guaranteeing subsistence and generating income to the household simultaneously. The government is concerned with its own political survival and encouraging rapid growth in different sectors of the economy; agriculture playing the leading role. The donor, GTZ-SUN in this case, does not have either subsistence or political survival to be concerned about. According to Fones-Sundell, this freedom enables the donor to define the problem as one of achieving 'sustainable growth'. The variation in the interpretation of the problem creates a dynamic social arena in the interaction of different actors in conservation schemes.

Jean-Pierre Olivier De Sardan mentions that in the development arena, there is a wide gap between discourses and practices; what is planned initially has little in common with the project implementation (Olivier de Sardan, 2005). The conservation based development intervention in Yaii Chebo from its inception was about sustainable natural resource utilization. During my field work I had realized that the issue of sustainability is not a concern at all for most farmers especially for those

with small plots of land and with no land at all. These farmers regardless of their knowledge and awareness about the consequences of their actions, they still clear forest lands in favor of farm land. They also plough river banks which is a lot risky business given the topography of the PA exposing the soil to runoff. These actions are condemned by the land owning farmers, GTZ contact person and the development agents. Land owning farmers view this as an opportunity to get closer to the power hierarchy as well as recognition in the project for incentives as well as in the PA administration.

During my field work there was one incident where by a farmer around kabi (lower altitude of the PKA) was burning bushes and remnant forest near the river bank to change it into a farm land. And the next day, farmers who were after appreciation and recognition both from the contact person and PKA administrators have reported his actions and he was arrested and taken to Ambo town.

But this instance of clearing forests in search of farm land is just one incident out of many and yet not all of them are given the emphasis like this one has got. Most of such actions are left unseen (deliberate or not) by other farmers unless they see a personal stake in it; in the above case was, appreciation and recognition by the administrators and the project contact person in anticipation of unforeseen benefits.

Since the conservation based development intervention by the GTZ-SUN Oromia based itself on community participation and involvement, high level of interactions among different actors taking part in the intervention are expected. All the different actors came together to tackle a problem which seems to be a common concern to all; and that is soil erosion.

Community participation in conservation measures is very important but their level of involvement varies from being just beneficiaries to active participants (Hailu, 2001). Community involvement in any conservation

work is efficient and cheaper than other alternatives. In Yaii Chebo conservation interventions, especially the later phases of interventions are based on community participation. Hence in order to gain the required level of participation from farmers, the conservation intervention has been using local informal and formal institutions.

The Strategic groups (actors) involved in the conservation based development intervention include the local people who are the target of the intervention, the funding agency (GTZ-SUN Oromia), the only GTZ contact person who is running the project, PA level administrative officials and development agents who mostly are facilitators or go-betweens in the intervention. This created a social arena gathering all the different actors who has interest in conservation interventions. The social interactions are sometimes based on different motives which at times had affected the ongoing conservation based development interventions.

A more visible interaction exists among local people who are targets of the conservation based development intervention, the PKA officials and the contact person who is the only representative of GTZ-SUN Oromia. As it had been mentioned earlier, the contact person of GTZ-SUN Oromia for this conservation scheme has been working with the farmers since the last eleven years now in the areas of land use planning and soil conservation. He was also leading the initial phases of conservation based development interventions, which were funded by the government. He had worked with the community for many years and as a result farmers have gained trust in this person and do all the things he tells them to do. Sometimes, farmers do a conservation structure out of the intention of pleasing him and nothing else. Whenever this person disappears from the picture, farmers show a sign of hesitation in the conservation schemes that had been done in their community for long years.

On the other hand the contact person had personal conflicts with some of the then PKA administrative people; people who are not in power anymore. Because of these personal conflicts it created divisions among community members and some of them took sides with the PKA administrative people. This has caused some of the farmers to destroy the soil conservation structures (terraces) from their farm lands to show their rebellion against the contact person. This merely shows how much the fate of the project lies at the hands of a single individual and every time interpersonal relationships failed with a member of the community, the terraces become at risk.

Case 5: according to Obbo Dachew there are problems on the way the conservation interventions are being handled. GTZ just focuses on the mere construction of terraces not on the follow up. Neither development agents nor farmers are following up the constructed conservation structures. Most of us had constructed terraces to just please the GTZ contact person. There was conflict between the previous PA administrator and the GTZ contact person, which allegedly, was over money on the project, which the former had accused the latter on the lack of achievement of the project with all the money invested and also personal spending. As a result the PKA administrator, having support from few farmers, requested the wereda to replace the contact person, which later led to a general discussion at the PA level and most farmers had supported the contact person. During that time, some farmers supporting the PKA administrator had destroyed terraces from their plots. Since then the contact person has moved most of the project activity to the neighbouring PKA (Goromti).

Although the project has finished its lifetime in Yaii Chebo at the moment, throughout the time of data collection I realized that farmers still think that the contact person is not coming more often now because of the conflict he had with the previous PA administrator. Sense of withdrawal

and resignation is what I observed in most of the farmers. As they told me during a focus group discussion:

..... (His name) used to come and provide us with vegetable seedlings, farm implements and make us work on terraces. But since the last year he is not coming anymore. They (administrative officials) have taken him away from us. But he is the one who saved our land.

It is always important to win the trust of farmers especially when a development expert go to a community with new farming practice, yet care should be taken that trust or relationship do not lead to the extent of blurring farmers what the main goal of the intervention is; which was the case in Yaii Chebo. Because, this kind of perception affected the sustainability of soil conservation structures as farmers are not motivated to continue adopting and hence maintaining the terraces on their plots of land. During the interview and informal discussion I had with the GTZ-SUN Oromia contact person, he believes that the fact farmers are asking for him during his absence is progressive. He further mentioned that, farmers' attitude towards soil conservation has been changed through the conservation schemes and hence that is the result of it. However, no matter what kind of relationship a change agent establishes with the local people, care is mandatory not to go between the intervention scheme and the people.

As a scheme of such scale the issue of representation has been completely forgotten. I encountered cases where farmers are not aware of who is organizing them to make terraces and who is offering incentives. GTZ was reduced to a single individual in this conservation scheme. The credit had all gone only to the contact person.

On the other hand, having been named as a collaborative conservation based development intervention between GTZ-SUN Oromia and Ambo

wereda agricultural and rural development bureau; there is a very weak link between the project and the agricultural bureau. Once the structures are built it was the responsibility for the agricultural bureau, hence the PKA level development office to follow up on the status on the conservation structures. There is no responsible body assuming ownership in terms of making sure these terraces and other soil conservation structures are maintained and integrated in the regular farming operation through time.

CHAPTER SEVEN - SUMMARY AND CONCLUSION

Ecological anthropology focuses upon the complex relations between people and their environment. Human beings have ongoing interaction and impact up on the land, climate, plant and animal species in their vicinities and these elements of the environment have reciprocal impacts on humans. In other words, the ways in which human population shape the environment and how the interactions result in the formation of social, economic and political livelihood adaptations are the major focuses of the ecosystem approach. This was clearly visible in Yaii Chebo, where the people's actions to fulfill their livelihood needs had impacted the environment tremendously beyond its holding capacity resulting in land degradation in the form of soil erosion. And the environment coupled with its steep sloped topography reciprocated its impact on people's livelihood. This impact has shaped the people of Yaii Chebo to adapt their livelihoods accordingly in the dynamically changing environment. Since their livelihoods entirely based on agriculture, their social networks and interactions have been framed within the changing environment.

A livelihood comprises of resources or assets or capital (human, natural, social, physical, financial capital and access to use these) that enables strategies to be employed in order to survive and attain desirable livelihood outcomes such as income, well being, food security, management of social relationships, affirmation of personal significance, and sustainable use of natural resources. Thus, with the existing asset and capital (human, natural, social, physical and financial) farmers in Yaii Chebo plan their livelihood strategies through the use of local informal and formal institutions in order to make sure they adapt to the rapidly changing environment. Hence, as the environment in which farmers operate changes, their perception towards the environment also changes as a way of adaptation.

The changes in the environment in Yaii Chebo are accompanied by population pressure, deforestation and subsequent land degradation in the form of soil erosion. It is at this point that soil conservation came as a form of adaptation by the farmers of Yaii Chebo to their changing environment. Hence, the awareness of farmers towards soil erosion problem, their attitude towards soil conservation measures and their knowledge on the causes and effects of soil erosion as well as its prevention methods highly determine the acceptability of development based soil conservation schemes in the PA. Since the last eleven years soil conservation interventions have been introduced by governmental as well as nongovernmental (GTZ-SUN Oromia) funds. Although each phase of conservation intervention focused primarily on awareness creation programs, the approaches of implementation of the conservation interventions show non uniformity. This could be easily noticed in the provision of incentives over the years which started with cash initially and then changed to material items on the later stages. This eventually affected the perception of farmers tremendously.

If soil conservation programs are to be effective, every effort must be made to develop practices which not only conserve the soil but also provide short term tangible benefits to the farmers. In view of this the soil conservation schemes in Yaii Chebo has been able to provide incentives for farmers either in the form of cash or material items (farm implements, apple and vegetable seedlings). Although apple seedlings has the prospect of diversifying the risks of farm households in case of integrating soil conservation practices in their farming systems, the emergence of disease on the fruit tree has blurred farmers' hopes. Hence, incentives would have to be expected to reduce the risks of farmers' with short term benefits on account of adopting soil conservation schemes, since the benefits from soil conservation are long term, not immediate. However, this form of incentive provision has created sense of dependency on farmers as the incentives

given to them were not good enough to diversify their livelihood. In addition, follow up and supervision should have been there until it is certain that the farmers are being long term beneficiaries of the incentives.

Decision to adopt soil conservation schemes takes time. However, in Yaii Chebo although the later phase of the intervention has given emphasis on community participation, the initial phase of the intervention was implemented without considering the will of farmers. Conservation structures were constructed on farmers' fields with no interest from farmers. Even the later phase of the interventions bases itself on community participation; farmers' have not been given enough time to go through the different stages of adoption process (awareness, interest, evaluation, trial and adoption). There was more emphasis given to group adoption than individual adoption processes.

A successful soil conservation scheme refers to the long term adoption and sustainability of conservation practices by the members of the community, making the continual external intervention and support unnecessary. Although farmers' of Yaii Chebo have accepted soil conservation structures on their farm fields as in the form of group adoption, the long term adoption of conservation practices is affected by the existing livelihood setting of individual farmers. In other words, the long term adoption of soil conservation schemes by farmers in Yaii Chebo is impeded by key factors such as landlessness and ownership of small land size holdings; which do not motivate farmers to stick to conservation practices. Social networks and human interactions particularly, power relations among all the actors involved, also play determinant roles in the long term adoption of the conservation schemes. Access to farm information on soil conservation practices highly depends on social and economic status of a particular farmer as well as close ties to the people at the higher ladder in this case project coordinators. Thus, at the end of the day, resource poor farmers failed to adopt soil conservation practices. Hence, the conservation scheme

should have been designed in such a way that it took contextual consideration of individual households to make sure of its sustainability. It should have been also designed to empower resource poor farmers with all the required information about soil conservation practices as well as creating equity in resource distribution.

On the other hand, in the study site it was noted that farmers are aware of soil erosion problems, and have favorable attitude towards soil conservation measures. However, awareness is not a guarantee to make farmers adopt conservation schemes. Farmers, rational in their own ways, put priority to their subsistence. As a result, based on their access to farm resources as well as social networking, farmers' action could degrade the soil continually or conserve the soil. Hence, I believe that awareness is not a necessary and sufficient condition for the adoption of soil conservation practices among the farmers' of Yaii Chebo. Thus, there should be a holistic and contextual approach to the whole process of soil conservation intervention involving many more actors which are not yet seen in the picture. It is then that, I believe all the multi faceted challenges are addressed and sustainability is attained.

Bibliography

- Abeya Iffa. 2001. *Adaptation, Culture and Changing Environment: The case of the Gumuz of Diddessa Valley (Kamasi Zone), West Ethiopia*. M.A. thesis. Addis Ababa University.
- Alemayehu Belay, Tariku Hunduma, Emebet Fekadu and Kefyalew Nigisho. 2007. *Gender based production systems in Ambo wereda, western Ethiopia*; in Yeshi Chiche and Kaleb Kelemu (eds.). *Gender differentials for planning agricultural research*. EIAR. A.A. Ethiopia
- Alemneh Dejene. 1990. *Environment, Famine, and Politics in Ethiopia. A view from the Village*. Lynne Rienner Publishers. Boulder and London.
- Ambo Wereda Agricultural and Rural Development Bureau (AWARDB). 2006. Unpublished Document
- Aneesa Kassam and Gemech Megerssa. 1994. *Aloof Alollaa : The inside and the outside; Boran Oromo Environmental law and Methods of conservation*. In David Brokensha (ed.) *A River of Blessings: Essays in Honor of Paul Baxter*. Foreign and Comparative studies/African series 44. Maxwell school of citizenship and public affairs. Syracuse University, Syracuse; New York
- Asmerom Legesse. 2000. *Oromo Democracy. An indigenous African Political System*. The Red Sea Press, Inc. Asmara. Eritrea
- Badiya, 2001. *Annual bulletin of west Shewa zone Department of Agriculture, Oromyia Region, Ambo*
- Bahru Shikur. 1993. *Farmers' Perception of Soil Erosion Problems and their Attitudes towards Soil Conservation in the Guraghe Highlands of Butajira Awraja, South Shoa*. M.A. thesis. Addis Ababa University.
- Barlett, Peggy F. 1980a. *Agricultural Decision making: Anthropological contributions to Rural Development*. Academic press Inc. Orlando:Florida
- Barlett, Peggy F. 1980b. "Adaptive Strategies in Peasant Agricultural Production". *Annual Review of Anthropology*. Vol. 9:545-573.
- Barth, Fredrik. 1969. *Ethnic groups and boundaries: The social organization of culture difference*. Little Brown and Company; Boston

- Bates, Daniel G. 1996. Case studies in Human Ecology. Plenum Press. New York and London
- Bernard. H. Russell. 1988. Research Methods in Cultural Anthropology. Sage Publications, Inc. Newbury park, California.
- Brokensha David. (Ed). 1965. Ecology and Economic development in Africa. University of California. Berkley
- Carney, D. (1998). Sustainable rural livelihoods: what contribution can we make? London, Department for International Development
- Chambers, R. and Conway, G. 1992. 'Sustainable rural livelihoods: Practical concepts for the 21st century. IDS discussion paper 296, Brighton: IDS
- Cramb, R.A and Cuasero, Z. 2004. Landcare and livelihoods: the promotion and Adoption of Conservation farming systems in the Philippine uplands.
http://www.worldagroforestry.org/sea/ph/02_pubs/2005_pubs/2005_pdf/08_LC%20%livelihoods.pdf
- Daniel Gemechu. 1988. Environment and Development. International Institute for relief and development. Food for hungry international. Switzerland.
- Department of International Development (DFID). Sustainable livelihoods guidance sheets, section DFID, London.
http://www.livelihoods.org/info/guidance_sheets_pdfs/section2.pdf
- Ellis, Frank. 2000. Rural Livelihoods and Diversity in Developing Countries. Oxford University Press. UK
- FAO.1986. Ethiopian highlands reclamation study. Final reports, vol. 1. Report for government of Ethiopia, MOA, FAO/Rome
- Fones-Sundell. Melinda. 1992. Survival for whom? Farmer, Government and Donor perspectives on land degradation in Sub-Saharan Africa; in Kebede Tato and Hans Hurni (eds). Soil conservation for Survival. The soil and water conservation society (SWCS). Addis Ababa;Ethiopia
- Found, Wilson C. 1974. A theoretical approach to rural land use patterns (2nd ed). Edward Arnold Publishers Ltd. London.

- Hailu Araya. 2001. Processes of soil erosion and aspects of community-based soil conservation in Grahutsa-Korir watershed in Eastern Tigray. M.A thesis. Addis Ababa University
- Kassie, M., J. Pender, M. Yesouf, G. Kohlins, R. Bluffstone, and E. Mulugeta. 20. 'Estimating Returns to Soil conservation adoption in the Northern Ethiopia
- Kebede Tato and Hans Hurni (eds.). 1992. Soil Conservation for survival. The soil and water conservation society (SWCS). Addis Ababa; Ethiopia
- Linberger, Herbert F. 1960. Adoption of new ideas and practices. The Iowa state University press, Ames, Iowa/USA.
- Lovejoy, Stephen B. and Napier, Ted L. 1986. Conserving soil: Insights from socioeconomic Research. Soil conservation society of America. Iowa USA
- MacDonald A.L. 1976. Agricultural technology in developing countries. Rotterdam University Press.
- Mohammed Hassen. 1994. The Oromo of Ethiopia: A History 1570-1860. Trenton, N.J.: Red Sea Press. Asmara
- Moran, Emilio F. 1990. The Ecosystem Approach in Anthropology. Ann Arbor: University of Michigan Press
- Olivier de Sardan, Jean-Pierre. 2005. Anthropology and Development: Understanding contemporary Social change. Zed Books; London and NY.
- Plattner, Stuart (Ed.). 1989. Economic Anthropology. Stanford University Press. Stanford: California
- Rogers, Everett M. 1960. Social change in Rural Society. Appleton Century-crofts, Inc. New York
- _____. 1962. Diffusion of Innovations. The free Press. New York
- Rogers, Everett M. and F.F Shoemaker. 1971. Communication of innovations: A cross cultural approach (2nd ed.) Free press.
- Salzman, Phillip Carl and Donald W. Attwood. 1996. "Ecological Anthropology." In Encyclopedia of Social and Cultural Anthropology. Alan Barnard and Jonathan Spencer, eds. Pp. 169-172. London: Routledge
- Sanders. David W. 1992. Soil conservation : strategies and policies; in Kebede Tato and Hans Hurni (eds). Soil conservation for

Survival. The soil and water conservation society (SWCS). Addis Ababa;Ethiopia

Schuscky, Ernest L. 1989. Culture and Agriculture: An Ecological Introduction to Traditional and Modern Farming Systems. Begin and Garvey Publishers. USA

Scoones, I and Thompson J. 1994. Beyond farmer first: Rural people's knowledge, agricultural research and extension practice. Intermediate Technology Publications. Great Britain.

Scoones, I. 2001. Dynamics and Diversity: Soil fertility and farming livelihoods in Africa. Earthscan Publications ltd. London

_____. 1998. Sustainable rural livelihoods: A framework for analysis. IDS working paper No. 72. Brighton: IDS. <http://www.ids.ac.uk/ids/booksshop/wp/wp72.pdf>

Soini.Eija. 2006. Livelihood, land use and environment interactions in the highlands of East Africa. PhD dissertation. University of Helsinki; Finland

Terefe Degefa. 2002. Land tenure links to environmental degradation cases from rural villages of central Ethiopia (1991 - 1997), in Ethiopian civil society preparation for RIO +10. Book Two. The forum for Environment and Heinrich Boll Foundation; Addis Ababa/Ethiopia and Nairobi/Kenya.

Wallman, Sandra. 1984. Eight London households, London, Tavistock

Yeraswork Admassie. 2000. Twenty Years of Nowhere: Property rights, land management and conservation in Ethiopia. Red Sea press Inc. NJ & Asmara.

Yohannes Gebremichael .2000. Soil and water conservation: From indigenous knowledge to participatory technology development. Center for Development and Environment (CDE), University of Berne; Switzerland

A. Historical trends/Historical timeline

The objective of this section is to discuss the major changes and outcomes; social, economic, and cultural that the community experienced in the last six to seven decades.

1. Start with the name of the PA 'Yaii Chebo'; how was it named like that?

- Who are the community residing in the Village?
- Relation with their neighboring peasant Kebele administrations
- When was the first time the village started to be inhabited

2. How has the community changed over the last 50 years, particularly with respect to?

- Resource availability
- Land tenure /Ownership
- Cropping patterns
- Farming practices
- Livestock rearing
- Environmental change (land, forest, natural resource management)
- Mobility and migration
- Rainfall pattern
- Cultural and religious trends
- Social values and norms
- Livelihood strategy and ways of lives
- Indigenous knowledge in resource management
- Knowledge, attitude and perception to the environment particularly soil erosion problems
- Soil and water conservation attempts and changes through time
- Gender role
- Development interventions in the community (who intervenes, to what extent, and participation of the community members)

3. Have any aspects of life become more difficult and challenging, if so, which ones and why?

4. When all these challenges occurred, what were their causes and follow through their effects on poverty and the ways of lives of the community?

Period/Date	Social, Economic, cultural changes in the community

B. Social, cultural and religious organizations

Are there any social, cultural and religious organizations or groups existing in the community? If yes, discuss on

- Names of the groups and Membership (by age, gender, etc)
- Purpose of each specific organization or group
- Which organizations are very important for the community(Rank them according to their importance) and the reasons for their significance

C. Seasonal calendar and Environmental change assessment

- How much change has been noticed in the seasons and environment (like rainfall pattern, farming activities, etc)
- How do seasonal variations and environmental changes affect the patterns of lives in the community?
- How do the variations in the altitude of the village affected the ways of lives of the community?
- Identify the rainy seasons in the area and try to visualize it with a map.
- List down the major agricultural activities

	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
Farming activities (To be identified by key plants)												

D. Strengths and problem existing in Yaii Chebo

- What good things and strengths exist in the community?
- What major problems are there currently that the community is facing? List them
- Identify the causes and effects of the identified problems

APPENDIX II. FOCUS GROUP DISCUSSION GUIDELINE FOR A STUDY ON LIVELIHOOD AND SOIL CONSERVATION PRACTICES

SEASONAL CALENDAR

Step 1. Patterns of Rainfall

1. Identify rainy seasons
2. Start from the months when land preparation starts
3. Note the months in which it rains and the number of days of rainfall per month

Step 2. Farming activities

1. Record the principal farming activities (e.g land preparation, land clearing etc)
2. Note the timing of each activity (in terms of months) on the calendar
3. Indicate the intensity of workload, For example, if symbols are used to represent a particular activity, add extra symbol to reflect greater intensity (Use proportion of four)

Step 3. Gender Division of Labour

1. Note who performs each of the tasks listed above, using proportion of 5 to represent 5 points, ask the group to indicate the relative contribution of women and men to perform each task.

Step 4. Other activities

1. List all the non-farm activities (e.g house building, thatching, etc) and repeat steps 2 and 3
2. Record also the seasonality of food shortages, patterns of income and expenditure, diseases or workloads over a year period.

Key questions

Are there times of the year when women's labour is not fully utilized?

Are there times of the year when men's labour is not fully utilized?

Which is the most appropriate season for additional activities? For whom?

which season of the year is accompanied by food shortage?

II. KNOWLEDGE, ATTITUDE AND PERCEPTION ON SOIL EROSION AND SOIL CONSERVATION PRACTICES

1. Ask the group how they see or understand their physical environment
2. What are the most challenging factors to live in such environment
3. What are the good things/factors of living in such environment
4. How did they manage to adapt (farming practices adopted) to live in such kind of environment?
5. Have they ever thought of being relocated to a different area?
6. Has in gender roles changed over the years with the change in environment?
7. Ask the group about soil erosion problems and its effects in their livelihood
8. Ask the group about existing indigenous soil conservation practices
9. Ask the group about soil conservation interventions that had been held by Government and Non-Governmental Organizations

VULNERABILITY CONTEXT

1. Ask the group what kinds of natural and human factors threaten their ways of lives over the years
2. Ask them to mention any shocking moments the community faced over the years
3. What kinds of negative changes are they encountering in their lives?
4. Have their lives in a way different from the ones living at the lower altitude of the Kebele?
5. Have the gender roles show any variation between the people living on the upper altitude and the ones living at lower altitude?
6. What measures have they taken to minimize risks they faced in their lives (for example it could be adopting conservation practices like terracing, land use planning, etc)

BASIC LIVELIHOOD ASSETS

1. Ask the group to list all the assets an average household can afford to have
2. What different assets (than what has been listed above) could a wealthy household have?
3. What natural capital (e.g like natural resources) does the community have?
4. What Financial capital (e.g credit opportunities, remittances,) does the community have?
5. What basic infrastructures (e.g road, electricity, water, etc) does the community have?
6. Ask the group what social resources (e.g. kinship networks, inter-household co-operation, and other groups) exist in the community. Ask also the degree of cooperation within the community

LIVELIHOOD STRATEGIES

1. Ask the group what their goal is in life. Ask them what they want to achieve or aspire.
2. What livelihood options or ways of lives do they follow to achieve their goals?

LIVELIHOOD OUTCOMES

1. Have you made any positive changes of achievements so far in your lives?
2. If so, what are they?
3. Do you see any improvements in your ways of lives over the years? If so what are they?

III. STRENGTHS AND PROBLEMS ANALYSIS

Strengths

1. Ask the group to list down major strengths of the community

Problems

1. Ask the group to list down the major problems the community is facing over the years
2. Ask them what alternatives they are using to solve these problems

IV. ORGANIZATION / GROUP PROFILES

1. Ask the group to list the main internal and external organizations existing in the community
2. And for each organization ask operational status, origin, date of formation, and purpose

APPENDIX III. QUESTIONNAIRE FOR HOUSEHOLD SURVERY

Date _____ Name of Interviewer _____

Name of respondent _____

Location: PA Yaii Chebo Got _____ Gere _____

I. Family Composition

1. Head of Household Man/Woman/Child _____

2. Marital status

1 Single	2 Widow	3 with wife	4 More than one wife	5 Absentee Husband
----------	---------	-------------	----------------------	--------------------

3. Family members

of the family member	Relation with the family	Age	Sex (M/F)	Category*	Academic background	Remarks

*1 Farmer, 2 Student, 3 employed, 4 partly farmer, 5 self employed, non farm engagement, 6 non-active member

4. Roles of the family Member

Member 1 _____

Member 2 _____

Member 3 _____

Member 4 _____

Member 5 _____

Member 6 _____

Member 7 _____

Member 8 _____

Member 9 _____

Member 10 _____

II. Socio-Economic Conditions

2.1. Household Resource base and farming practices

2.1.1. Resources for farming

1. What area of land do you own for farming?

(1) None	(2) 0.125ha-0.5ha	(3) 0.5ha-1ha	(4) 1ha-2ha	(5) 2ha-3ha	(6) 3ha-4ha	(7) >4ha
----------	-------------------	---------------	-------------	-------------	-------------	----------

2. What other means do you have to get land for farming?

1. Contract 2. Share 3. Hired 4. Borrowed 5. Other (specify)

3. What area of land do you farm on contract?

(1) None	(2) 0.125ha-0.5ha	(3) 0.5ha-1ha	(4) 1ha-2ha	(5) 2ha-3ha	(6) 3ha-4ha	(7) >4ha
----------	-------------------	---------------	-------------	-------------	-------------	----------

4. What area of land do you own for grazing?

(1) None	(2) 0.125ha-0.5ha	(3) 0.5ha-1ha	(4) 1ha-2ha	(5) 2ha-3ha	(6) 3ha-4ha	(7) >4ha
----------	-------------------	---------------	-------------	-------------	-------------	----------

5. What area of forestry land do you own?

(1) None	(2) 0.125ha-0.5ha	(3) 0.5ha-1ha	(4) 1ha-2ha	(5) 2ha-3ha	(6) 3ha-4ha	(7) >4ha
----------	-------------------	---------------	-------------	-------------	-------------	----------

6. Is there any area of land which you do not cultivate? 1. Yes 2. No

7. If yes, why?

1. Because it is not accessible due to its steep topography
2. Because it is near river bank
3. It is a land left fallow

8. Ownership status of Crops and Livestock resources

Livestock	Number
Oxen	
Cows	
Donkeys	
Sheep	
Chicken	
Horse	
Goats	
Mule	

Trees	Number/area(ha)
Forest trees	
Apple	
Eucalyptus	
Enset	

9. Major Crops and vegetables Grown in the household (at least in the last 5 years)

Crops	Area of land allocated (ha)	Yield/ha
Barley		
Wheat		
Teff		
Beans		
Pea		
Lentil		
Chick pea		

Vegetable	Area of land allocated (ha)	Yield/ha
Potatoe		
Onion		
Garlic		
Cabbage		
Carrot		
Beet root		

10. What equipment / assets do you use on the farm and at household?

Farm Equipment	Number	Household Equipment/assets	Number
Plough		Household with iron sheet roofs	
"Horda"		Household with thatched grass	
Hoes		Radio	
Sickles		Granary	
Axes		Hand mill	
Harrow		Fuel saving stove	
Fork			
Spade			

11. Do you use any purchased inputs (fertilizers, improved seeds and chemicals) for farming?
 1. Yes 2. No

12. Do you have access to credit and extension service? 1. Yes 2. No

13. How do you prepare the land?
 1. hand 2. Draught animals 3. Others (Specify)

14. Who works on the farm?
 1. Family labour 2. Hired labour 3. Both 4. Using labour exchange (Dado, etc)

15. Is there any division of labour among family members? 1. Yes 2. No

16. If yes, who works what? _____

17. Do you use any non-family labour? 1. Yes 2. No

18. If yes (Specify when)
 1. During peak seasons 2. Always 3. when using labour exchange means

19. Is your farm land on located on a steep slope a sloppy area? 1. Yes 2. No

20. Is it accessible for oxen ploughing? 1. Yes 2. No

21. Is there any part of your field which is not accessibly by oxen? 1. Yes 2. No

22. If yes, do you use manual digging to plough that part of your field? 1. Yes 2. No

III. Knowledge, Attitude and Perception on Soil erosion and soil conservation practices

	Agree	Disagree	Not sure
The possible causes of soil erosion: a) Population pressure b) Deforestation c) Rainfall d) Run off e) Soil type f) Inappropriate land use practices			
Steep slope farms are prone to soil erosion and erode faster than gentle slope farms			
We say the soil is eroded when crop productivity declines over successive years			
We know the soil is eroded when the soil is unable to grow crops which it formerly grows			
Soil is eroded if the farm field needs more input (such as fertilizer) than previous years			
Inappropriate land use practices result in soil erosion			
Thin soil can be eroded by wind and run off faster than thick/fertile soils			
Soil erosion is severe in the higher altitude of the our PA than the lower altitude			
Soil conservation structures such as terraces retain water in the farm field			
Terraces contribute to growing grass that serves as animal feed			
Soil conservation structures should be maintained regularly to avoid soil loss			
The topography of our area is convenient for farming			
We can prevent soil erosion problem completely			

14. Do you use Terracing to prevent soil erosion? 1. Yes 2. No

15. If yes, since when? _____

DECLARATION

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

Name: Alemayehu Belay

Signature: 

Date: November 2009

Confirmed by:

Advisor: _____

Signature: _____

Date: November 2009