

---

Contents	Page
Preface .....	iii
Acknowledgements.....	vii
Contributors .....	viii
1. Forests of Sheka: Ecological, social, legal and economic dimensions of recent landuse/landcover changes-- overview and synthesis, <i>Tadesse Woldemariam</i> and <i>Masresha Fetene</i> .....	1
2. Landuse/Landcover Changes in Andracha and Masha <i>Woredas</i> of Sheka Zone, SNNP Regional State, <i>Bedru Sherefa</i> .....	21
3. The impact of landuse/landcover changes on biodiversity in Masha and Anderacha <i>Woredas</i> of Sheka Zone, SNNP Regional State, <i>Tadesse Woldemariam</i> .....	57
4. The impact of cultural changes on the people of Sheka and their traditional resource management practices: the case of four <i>kebeles</i> in Masha <i>Woreda</i> , <i>Zewdie Jotte</i> .....	89
5. Legal and Institutional Analysis for Sustainable Use of Forest Resources: The Case of Sheka Forest in Southwestern Ethiopia, <i>Mellese Damite</i> and <i>Mohammud Abdulahi</i> .....	137
6. Economic Value of Afromontane Natural Forest in Sheka Zone, Southwestern Ethiopia, <i>Aseffa Seyoum</i> .....	183
7. Appendix 1 Landcover classes (ha) of each <i>kebele</i> in Masha and Anderacha <i>Woredas</i> in 1987 .....	219
8. Appendix 2 Landcover classes (ha) of each <i>kebele</i> in Masha and Anderacha <i>Woredas</i> in 2001 .....	220

9. Appendix 3 List of plant species recorded in Masha and Aderacha *Woredas* of Sheka Zone .....221
10. Appendix 4 Some of the participants of focus group discussion and key informants .....230
11. List of abbreviations .....231

## Preface

### *MELCA Mahiber and the African Biodiversity Network*

This book is the first product of MELCA Mahiber's engagement in research and advocacy in sustainable management of environment and conservation of indigenous knowledge and culture. MELCA is part of the African Biodiversity Network (ABN). In fact it can be said that it is a child of the ABN. The ABN is a regional network that promotes the sustainable development and conservation of biodiversity in which local communities and indigenous knowledge play a central role. ABN has organized exchange visits, trainings, workshops, distributed materials, etc. for improving the capacity of its network members on diverse issues. Previously the focus of ABN was mainly on the situation of small scale farmers, and the threat to biodiversity of technologies such as genetic engineering. Recently, through its work on Community Ecological Governance and Cultural Biodiversity, ABN is working on issues related to traditional ecological knowledge and its transfer to the next generation. ABN believes that local/indigenous/traditional communities have valuable perspectives relevant to caring for the earth, conflict resolution, healing the sick, educating the young and keeping our intellectual and cultural heritage alive. We believe that Africans have been protecting their environment, still are in some communities, with their governance system. Their governance system mostly uses customary laws. Thus we wanted to document such customary laws and evaluate how they relate with both country and environmental laws. The present book originated from this desire.

### *How did we go to Sheka*

The situation in Sheka Forest, one of the few remnant forests of Ethiopia, was brought to our attention through our collaboration with Ato Meles Damtie, a lecturer in law at the Civil Service College, in Addis Ababa. One of his students had done a study in Sheko and the study had revealed that there was a rapid degradation of both the environment and the culture of the local communities in Sheka. The result of the study was quite a shock to many of us. At the time, MELCA was not yet established and we were warming up to work with an environmental education project in the Bale Mountains National Park. From the start, our aim was to be an NGO involved in environmental advocacy to the point of taking offenders of the environment to court. At this juncture, we met with the Organization for Social Justice Ethiopia and agreed with them to explore the possibility of doing an environmental litigation based on Sheka. Nigussu Aklilu of the Forum for Environment joined us and at the end of our repeated meetings, we agreed to do a thorough study of the land use, cultural and legal and institutional environment of the Sheko area before we embark on advocacy.

In parallel to the study, the second strategy was to have a group of NGOs as advocacy group on forest issues. Our important agreement was that we should possess strong research reports before we do any kind of advocacy.

We felt that if we do advocacy, we should not start with complicated issues but tackle areas where land use change is new and where the environment is relatively intact. So we changed the focus to Sheka instead of Sheko.

#### *Preparation for advocacy*

The study was commissioned to researchers who all had prior experience to the area. As they began the work, what was coming from the field was so alarming that we agreed to move very fast or we may not contribute at all to saving the forest. When the first research reports were submitted, we called stakeholders from the communities, local, regional and federal government representatives and non-governmental organizations and held a one day workshop. The workshop was hotly debated and one of the recommendations from the participants was a study on the economics of the Sheka forest which was commissioned and included.

While the research activity was going on, the build up of the advocacy group was also taking place. We organized a five day workshop where the fundamental issues of advocacy work were taught to participants from several NGOs in a practical way. This brought to us the need for taking carefully calculated and incremental steps to do a proper advocacy. We then organized a three day workshop to produce a strategy document for doing advocacy on Sheka. Three broad strategies were outlined. One was empowering the local community to do advocacy. This entailed training the local community on their cultural and environmental rights and providing the necessary support for doing so. The second was to improve law enforcement on issues related to environment and culture. The third was to work for the issuance of policies related to the environment, the forest policy being an example. The workshop also decided that we should have an organized advocacy group. Later on a term of reference was developed and nine NGOs and three lawyers became the founding members of the group called 'Sheka Forest Alliance (ShaFA)'. ShaFA met again and refined its strategies which included advocating for the issuance of regulations, guidelines and circulars related to the environment, empowering government offices with relevant information regarding existing laws and training them in monitoring development programs, studying how the EIA law became subservient to other laws in the country and recommend for its reinstatement, rallying the public around the Sheka forest and working for the legal recognition of sacred forests and other sites considered as critical by the community and the local government.

Following the development of the strategy we organized, awareness raising workshops and capacity building trainings. A two days workshop was given for zonal and *woreda* officials on environmental and cultural rights in the constitution and other laws and policies. A similar workshop was conducted at regional level. We also organized ‘training of trainees’ for 37 local members (clan leaders and youth). Upon returning to their communities, the trainees participated in raising the awareness of close to four thousand people. A workshop on international and national environmental and cultural rights, as well as on policies and proclamation of the Government was given to *kebele* administrators and participants from several women associations. Following recommendation at the workshop, further stakeholder workshop was organized with the local government, clan leaders, community and local advocates who agreed to take a lead in halting the deforestation of the forest.

*Eco-mapping, an emerging tool for advocacy*

As part of the advocacy work, we introduced training on eco-mapping which offers an excellent opportunity to understand issues related to traditional ecological knowledge and deepen our work with local communities. Mapping can express many types of relations. One landscape may have very different meanings for different cultures. It is often this lack of cultural dialogue and understanding that causes sharp conflict between indigenous peoples and dominant institutions. These knowledge systems have been under serious attack for centuries and the social systems that support them have been seriously undermined. It is not a question of recovery and recording indigenous knowledge, but one of respecting and revitalization.

Participants of the training on eco-mapping at Sheka came from local government, five other African countries, three universities in Ethiopia and local community members. With the guidance of the local communities, GPS records of cultural sites, sacred sites, areas where important fauna and flora were located, villages, investment sites, and critical natural resource sites were taken. The information was put on satellite map with full participation of the local communities. One of the most astounding discoveries for us was how the whole forest was divided among people in a system called Kobo. There was no piece of land on which one person’s livelihood did not depend on. An additional benefit of this exercise was that we were able to understand what the issues related with forest and the cultures were. Based on the map, the Government and local people started to dialogue about the future. The local community also felt that they were part of a process to protect their forest and showed willingness to collaborate in future endeavours for saving the forest.

The impact of participatory eco-mapping is not limited to mapping “end products” alone. As evidenced by the Sheka experience, the process itself, from an early stage, invariably plays a vital role in establishing mutual cooperation between stakeholders and in generating great motivation and commitment towards shared goals of resource conservation, “sustainable livelihood development” and the promotion of identity and pride. This was evidenced by the comments made by clan leaders and authorities at the meeting arranged by MELCA on 12th November 2006.

### *The future*

The future holds very broad perspectives. Some are:

- Ensuring the legal rights of the local communities to their territory, this includes their culture, through advocacy work.
- Using the Sheka forest as a spring board for other advocacy work to protect the remaining forest and other ecosystems in the country;
- To strengthen the advocacy group in Ethiopia with a broad basis so that advocacy work is improved in Ethiopia.
- Continue to empower local communities so that they fight for their rights. We believe that this is the ultimate goal, and
- Continue to explore alternative livelihood mechanisms for the local people.

It is our sincere hope that the this book will help us to get to know better the Sheka forest and encourage us to work with both the local community and the local government, who by the way, are doing their best to save their forest, and us.

Million Belay,

Director

MELCA Mahiber

## Acknowledgments

MELCA would like to thank the Gaia Foundation, for its huge editorial, fundraising, intellectual and advisory support. We would also like to thank the Dutch Biodiversity Fund and HIVOS Netherlands, SwedBio of Sweden and European Commission for their financial support to the African Biodiversity Network of which we are part. We would also like to extend our heartfelt gratitude to Bothends, IUCN Netherlands and the Heinrich Böll Foundation. We also would like to thank the Swedish Society for Nature Conservation, Restore UK, Arsi Bale Rural Development Program and the Frankfurt Zoological Society for their supporting our work.

The support that we are getting from the Regional Government of the Southern Nations and Nationalities and Peoples Region, the Sheka Zone Administration and other offices, the Masha and Andracha *Woreda* Government Offices and local *Kebele* Administrations is immense.

We would like to extend our uttermost appreciation to the local communities, including the clan leaders, of the Masha and Andracha *Woreda*. Their trust, drive, commitment and understanding form the foundation for our activities.

**Contributors**

- 1 Assefa Seyoum (Ato)  
Ethiopian Agricultural Economics Society  
E-mail: aseyoumw@yahoo.com
- 2 Bedru Sherefa (PhD)  
Dresden Technical University  
E-mail: bedrry@yahoo.com
- 3 Masresha Fetene (Prof.)  
Department of Biology, Addis Ababa University  
E-mail: mfetene@bio.aau.edu.et
- 4 Melesse Damtie (Ato)  
Ethiopian Civil Service College  
E-mail: melesd@yahoo.com
- 5 Mohammud Abdulahi (Ato)  
Ethiopian Civil Service College  
E-mail: mohabub@yahoo.com
- 6 Tadesse Woldemariam (PhD)  
Faculty of Education, Addis Ababa University  
E-mail: twgole@ethionet.et
- 7 Zewdie Jotte (Ato)  
Ethiopian Coffee Forest Forum  
E-mail: zewdiejote@yahoo.com



# **1 Forests of Sheka: Ecological, social, legal and economic dimensions of recent landuse/landcover changes--overview and synthesis**

**Tadesse Woldemariam and Masresha Fetene**

## **1.1 Summary**

This is a report of a multidisciplinary study on the impacts of landuse/land cover changes in Masha and Anderacha *Woredas* of the Sheka Zone in the SNNP Regional State, Ethiopia. The study consists of cases on landcover changes based on satellite images, assessment of floristic diversity, investigation on culture and traditional natural resources management practices, analysis of the legal and institutional frameworks and economic value estimation of the forest.

Findings of the study showed that the Sheka Zone is one of the few areas with high forest cover in Ethiopia. The forest is the major source of livelihood of the people in the area. Due to high level of dependency on forest resources, the local communities have developed traditional management practices based on religious taboos and customary tenure rights. Such management practices have sustained the forests for centuries and contributed to the better condition of the forests in the area, as compared to other parts of the country.

However, the rate of deforestation has aggravated in recent years due to increased rate of conversion to agriculture and monoculture plantations of coffee and tea. From the landcover changes using satellite image of 1973, 1987, 2001 and 2005, it can be seen that the net annual rate of deforestation has increased dramatically since the 1990s. Such changes can partly be attributed to increased concessions of forestlands to investments in plantation, cultural changes of the local communities and government policies and laws.

In recent years, over 40 investment projects were given license and forestland to invest in coffee and tea plantations. The biggest ones include the Gemadro Coffee Plantation, which has acquired and developing coffee on 2,295 ha and has been promised an additional 2,000 ha in Aderacha *Woreda*; and the East African Agribusiness, which was also granted around 3,435 ha of forestland for tea plantation.

Cultural changes have come as a result of conversion of the local community to protestant Christianity and increase in the number of urban dwellers, members of immigrant workers on the plantations. Changes in the belief system has changed people's perceptions and respect to taboos regarding cultural forests, sacred sites and sensitive habitats such as riverine forests, wetlands and rivers. Increase in population has also created market for fuelwood, which has encouraged some members of the local community to sell fuelwood on local markets.

Government policies and laws also failed to recognize the traditional tenure rights of the community, their management practices and the religious values of cultural forests to the people. Both the Federal and Regional policies retracted the land ownership rights of the local community clearly provided in the Federal Constitution. Despite the statement in the Federal Constitution which states that land belongs to the community, the Federal Land Proclamation, and the Regional Rural Land Administration and Utilization Laws, retract the constitutionally guaranteed land ownership right from communities. Under the current Constitution, the State and the Nations, Nationalities and Peoples of Ethiopia own land. The Constitution does not give supplementary rights in favor of the State against the Nations, Nationalities and Peoples. The different policies and laws proclaimed at different times contradict each other, as is the case with the EIA Law, Investment Law and the Penal Code. The institutional arrangements at different levels are weak, inefficient and poorly organized to implement policies, and often there is a total mismatch of duties and responsibilities of institutions. Recommendations for sustainable use of the forest and for minimizing environmental risks of development activities are forwarded.

Forests have both direct use and non-use values. Knowledge on the various use and non use values of a forest, and when possible its economic valuation, has important implication in setting priorities of management. The last report in this study dealt with an attempt to identify and describe the various use and non-use values of Sheka Forest and estimate, so far as possible, economic values of the components in order to indicate possible interventions.

The study used both primary data, collected through focus group discussions, key informant surveys, and household surveys using semi-structured questionnaire, and secondary data collected from relevant zonal and district offices in the study area and from pervious studies. It was found that on average, sampled households generated about 44 per cent of their income from forest and forest products. Direct use value of the natural forest

for house construction, furniture, utensils, farm implements and for fencing purposes was estimated to be Birr 89 per ha per annum, while the value of non-timber forest products from the forest was estimated to vary from about Birr 1,192 per hectare, based on current extraction level, to Birr 8,142 per hectare under exploitation of the potential of the natural forest with zero management.

In general, conservation under traditional use system of Sheka Forest with minimum or zero management was estimated to have an average economic value of Birr 10,572 per hectare per annum. This, for the closed forest (67,794 ha) and the open forest (35,077 ha) together, amounts to about Birr 1.087 billion per year. Taking the bamboo forest alone, under sustainable extraction and proper management, it was estimated that it could bring benefits ranging from Birr 542 to 813 million per annum. The carbon storage value of the forest was estimated to be about Birr 2 billion and cost of conversion of this natural forest to perennial crop plantation, in terms of carbon release, was estimated to be about Birr 3,400 to 17,425 per ha. It is interesting to note that the use value of the natural forest in the form of non-timber forest products, under the traditional production system, was found to be about two fold of the net benefits from land allocated to investment in tea plantation. It is expected that these studies will bring useful perspectives in the protection and management of this pristine forest.

## 1.2 Introduction

Landuse/landcover change is a common phenomenon in all parts of the globe. There are several possible causes for landuse/landcover changes, and they may have economic, political or social reasons. Landuse/land-cover changes, like their causes, have multidimensional consequences. To mention few of them, cover changes may affect biodiversity, the environment and ecosystem services in general, livelihood of the local community, local conflict due to use right or tenure right, and traditional religion and belief systems. However, most studies on impact of cover changes, especially forest-cover changes usually single out one dimension like the impacts on biodiversity (Tadesse 2003); or socio-economic aspects (Alemneh 1990).

This study reports an interdisciplinary investigation on the impacts of landuse/land cover changes in the Masha and Anderacha *Woredas* of the Sheka Zone in the SNNP Regional State. The Sheka Zone is one of the few areas in the country with high forest cover. However, the area is experiencing high rate of deforestation due to mushrooming of investments

in plantation in addition to the local deforestation for agriculture and other landuse types. This study has been initiated out of a concern for the recent rates of forest cover changes. The study was commissioned by MELCA Mahiber, a local non-governmental, non-profit organization.

The study looked at the impact of forest cover changes from five perspectives: (1) landuse/landcover change detection in the two *woredas* and some selected *kebeles* using satellite images of different years (Chapter 2); the impact of landuse/land cover changes on biodiversity (Chapter 3); the impact of cultural changes on the traditional resources management practices (Chapter 4), legal and institutional analysis for sustainable use of forest resources (Chapter 5) and the economic value of the natural forest (Chapter 6).

This first chapter is a synthesis of all chapters and case studies, with the objective of giving an overview of the whole study. It covers sub-sections on background of the study, scope of the study, study methods and major findings of the study. Conclusions of the study and recommendations for management and further studies are also forwarded at the end of the Chapter. Chapters 2 through 6 provide detailed study results on different aspects of the impacts of landuse changes.

### **1.3 Background of the study**

According to climatic climax vegetation cover of Ethiopia, the whole plateau of the SW part could have been covered by forest vegetation (Anonymous 1988). Forest cover of the region has been declining from time to time over the last two to three centuries mainly due to increased human settlement. The sporadic movement of people from the northern regions to the central and southern regions of Ethiopia dates back to the seventeenth century (Alemneh 1990). Such population movements became more common during the period of expansion by Emperor Meneilik (1855–1913) and intensified under Emperor Haile Selassie's rule.

The forest cover of the highland plateau in the SW was quiet high until recent years, when compared to other parts of the country. The change in forest cover during the last 30 years is the most severe anthropogenic catastrophe that the country has seen. Reusing (1998) estimated that the closed high forest of SW Ethiopia dropped from a 40% cover between 1971 and 1975 to only ca. 18% by 1997, which is a loss of ca. 60% (Tadesse *et al.* 2002). Conversion of forestland to other landuse types is the major cause of

deforestation. Around 235,400 ha of closed and slightly disturbed forest areas were deforested between 1971 and 1997, a loss of about 10,000 ha forest every year (Reusing 1998).

This study focuses on two *woredas* in Sheka Zone of the SNNP Regional State, namely Masha, and Anderacha. The Sheka Zone has very high forest cover (about 47% of total area). It is the center of origin for many spices and tuber food crops. These *woredas* are part of the SW highland plateau. The area was selected for this study due to the exceptionally high rate of deforestation in the area in recent years. The area was exposed to all causes of forest cover change, ranging from conversion to agriculture by smallholder farmers to large-scale coffee and tea plantations of their first kind in the country. The process of forestland allocation for investments in plantation still continues without any environmental impact assessment, and the impact on the livelihood of the people.

The process of getting investment license and land appears to be not difficult in the Zone. There are two possibilities: (1) the investment office carries out studies and promotes or (2) the investor carries out a study and applies for license.

Around 43 investment projects have already acquired license and are operating in the Zone at the moment. Six more new projects are in the pipeline. Fourteen of them are investments on large areas, larger than 50 ha, and most are for coffee plantations (Table 1.1).

**Table 1.1 Some of the major recently allotted forest areas for investments in plantation in Sheka Zone**

No.	Investment group name	Area (ha)	<i>Woreda</i>	<i>Kebele</i>	Remark
1	Azage Anbelo	80	Anderacha	Yokchichi	Impl.
2	Abebe Anteneh and Welashe	Belay 1500	Anderacha	Yokchichi	On proc.
3	Shishi Opi	120	Yeki	Depi	On Proc.
4	Worku Ado	170	Anderacha	Echi	Impl.
5	Awel Muzein	160	Yeki	Alamu	Not Imp.
6	Denbi Fuafuate	240	Yeki	Achane	Impl.
7	Gahiberi	85	Yeki	Achane	Impl.
8	Tesfaye Ibro	120	Yeki	Dayi	Impl.
9	Yebora Agri Dev't	109	Yeki	Shimerga	Impl.
10	East African Tea Plantation	3435	Masha	Chewaka	Impl.
11	Gemadro Coffee Plantation	2295	Anderacha	Gemadro	Impl.
12	Gemadro Coffee Plantation II	1000–2000	Anderacha	Duwina	On Proc.
13	Kodo coffee	70	Masha	Uwa	Impl.
14	Shebena coffee	67	Anderacha	Shebena	Shebena

Source: Sheka Zone Investment Office

Several farmers have also got forest-plots for coffee plantation establishment, especially around Gemadro and Yokichichi *Kebeles*. Such changes to plantation are permanent conversion of forestlands for other uses, as compared to conversion to agriculture (shifting cultivation). Besides the impact of such changes on the environment and biodiversity, there is a growing conflict on forest resources, violations of traditional tenure rights and taboos, cultural changes and changes in traditional forest resource management practices.

#### **1.4 The scope of the study**

The aim of the study was to find out changes in forest sizes and its consequences on forest biodiversity of selected forests of Masha and Anderacha *Woredas* of Sheka Zone, SNNP State as a result of disturbances such as expansion for agricultural lands, investments, resettlements and other forces. In particular, the study was carried out so as to meet the following objectives:

- Collect and analyze literature, aerial photographs and satellite images to establish the sizes of the selected forests before disturbances;
- Collect and analyze publications to establish the species composition of the forest prior to disturbance;
- Establish the current status of the forest from recent satellite images (2005);
- Analyze the changes in forest size and vegetation compositions because of disturbances;
- Analyze the impacts of changes to the forest wildlife and other aspects of biodiversity;
- Identify the major causes of disturbances; and
- Suggest strategies to avoid further destructions and enhance forest covers in the future.

## 1.5 Materials and methods

### 1.5.1 The study area

The Sheka Zone is located in the Southern Nations, Nationalities and Peoples (SNNP) Regional State. Geographically, the Zone lies between 7°24'–7°52' N latitude and 35°13'–35°35' E longitude.

The Zone has three *woredas* (districts), namely the Masha, Anderacha and Yeki (Figure 1.1). In total, there are 56 rural and 7 urban *kebeles* in the three *woredas*. Sheka Zone covers about 2175.25 km<sup>2</sup>, out of which, *ca.* 47% is covered by forest, including bamboo. The altitudinal range of the areas in the Zone falls between 900–2700 m asl, and it receives high amount of rainfall, with an average of 1800–2200 mm annually.

This study focused on two *woredas*, Masha and Anderacha, as case studies for forest cover changes studies, and impacts on biodiversity (Chapter 2 and 3). The study on cultural change (Chapter 4) focused only on selected *kebeles* in Masha *Woreda* due to the nature of the study.

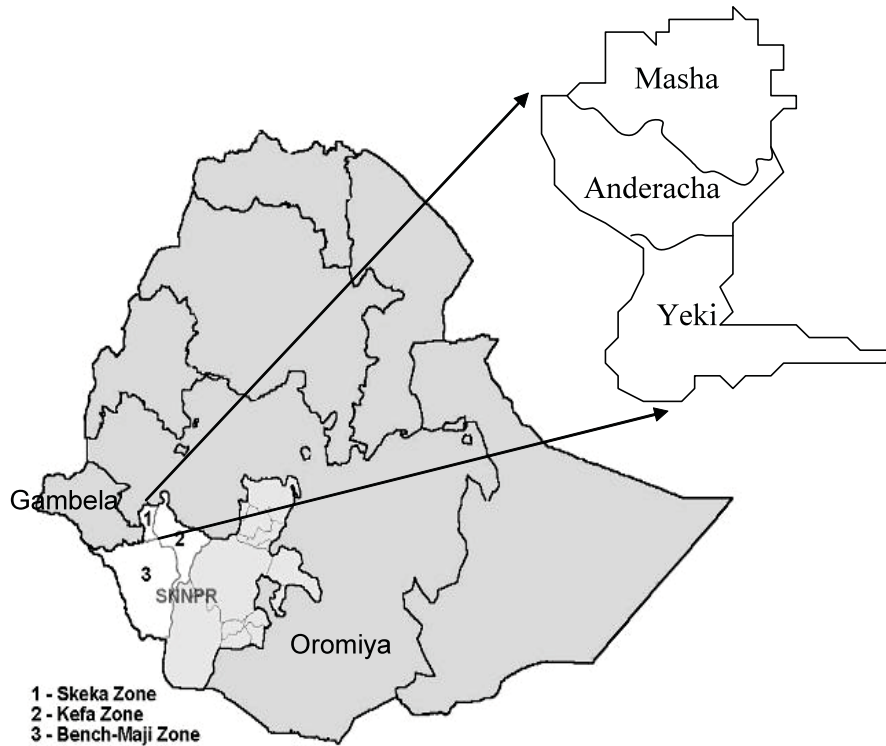


Figure1.1 Map of the study area

### 1.5.2 The study methods

The study was interdisciplinary in nature. For the land cover changes detection, satellite images of four different years: January 1973, February 1987, February 2001 and March 2005 were used, classified into different land cover classes and compared with each other (Chapter 2).

For forest biodiversity assessment, a rapid biodiversity assessment (RBA) was carried out in major forest vegetation types in the study areas. Transect walk with key informants was used to record plants in different forest cover types. Phenology and local uses of major plant species were also noted. Systematic sampling method was used to gather quantitative data of the forest vegetation (Chapter 3).

For the study on cultural changes, various methods were employed to collect reliable information. These included participant observation, group discussion, and in-depth interviews. The study focused on two *kebeles* of Masha *Woreda*, namely Beto and Wollo Shoba. The two *kebeles* were found to be appropriate to address the research objectives on cultural changes affecting resource management related to investment and religious beliefs (Chapter 4).

For legal and institutional analysis (Chapter 5), legal and policy frameworks at international, federal and regional government levels, and the institutions and law enforcement mechanisms at different levels, including local level institutions were assessed. The study team thoroughly analyzed the coherence between the international conventions, the federal constitution, policies and proclamations on natural resources and community rights, and the regional government's policies and proclamations, and institutional arrangements to implement them at local level.

For the economic valuation study both primary data, collected through focus group discussions, key informant surveys, and household surveys using semi-structured questionnaire, and secondary data collected from relevant zonal and district offices in the study area and from previous studies were used.

## 1.6 Major findings

### 1.6.1 Cover changes

Land cover change for all *woredas* was based on the 1987 and 2001 satellite images. The analysis revealed changes in land cover. The area under forest cover has dropped significantly in all parts. For instance, dense closed forest



decreased from about 55,304 ha in 1987 to 43,424 ha by 2001. On the other hand, open forest decreased from 46,594 ha to 35,077 ha during the same period. Disturbed forest area increased from 8,015 ha to about 24,370 ha, while agricultural land increased from 8,620 ha to 14,672 ha. As can be seen from these cover changes, the major causes of cover changes are forest disturbance and expansion of agriculture. Agricultural land for crop production has almost doubled within the 14 years period. The area coverage of bamboo and wetland classes changed very little during the study period. Land cover changes due to coffee and tea plantations are very recent phenomena in the region. For instance, the area covered by tea plantation reached 758 ha by 2001, and there was no such cover in 1987.

Detailed study of land cover changes was carried out on two areas selected as cases for this study due to the presence of all causes of land cover changes including plantation. The first case is cover changes in four *kebeles* namely: Uwa, Keja-Chewaka, Welo and Beto, which border the East African Tea Plantation. The summary of changes in coverage of different cover types is given in Table 1.2. Detailed changes/conversions from one cover type to another during each period can also be found in Table 2.5 in the next chapter.

**Table 1.2 Summary of changes in cover types**

Cover type/year	Per cent cover			
	1973	1987	2001	2005
Dense forest	60	50	32	20
Disturbed forest	0	9	28	30
Open forest	26	25	18	21
Agric/ tree mosaic	2	2	2	2
Agriculture	5	7	9	10
Exposed/ Cultivated	5	3	3	6
Wetland	3	3	3	3
Plantation	0	0	5	8

Dense forest cover has dropped significantly from about 60% in 1973 to 20% by 2005, while the cover of disturbed forest, agriculture, and plantations has increased from about 0% to 30%, 5% to 10%, and 0% to 8% of the total land cover of the study area, respectively. Hence, conversion to agriculture, plantation and widespread disturbance are the major causes of

changes in land cover in the four *kebeles* around the Chewaka-Uto Tea Plantation near Masha.

It was also found out that the EAA tea plantation in Chewaka-Uto prepared two different property maps. The company had cleared forest areas of about 266 ha outside of its property map in one case (Figure 2.12) and 196 ha in another case (Figure 2.13). The company has also violated its agreement to leave at least 1200 m wide riverine forest vegetation along side the Baro River. Currently, the tea plantation is only about 90 m away from the Baro River.

The extent of forest cover change around Gemadro Coffee Plantation is even worse. In 1973, dense forest covered about 78% of the total area of Gemadro *Kebele*, which has dropped to only 16% by 2005 (see Table 1.3). The cover type, agriculture/tree mosaic, which actually represents the coffee plantation in this case, has increased from almost nil to 33%. Forest disturbance and conversion to agriculture have also increased significantly.

The highest deforestation rate was observed in Gemadro, with annual deforestation rate of about 12.2 per cent. Deforestation was aggravated because farmers and other small investment projects are expanding coffee plantation in the area, following the establishment of the Gemadro Coffee Plantation.

**Table 1.3 Summary of cover changes at Gemadro, around Coffee plantation**

Cover type	% Cover			
	1973	1987	2001	2005
Dense closed forest	78	43	15	16
Closed forest (disturbed)	7	8	17	17
Open forest	14	43	42	12
Agric/tree mosaic	1	5	6	33
Agriculture	0	0	18	14
Exposed/cultivated	0	0	2	1
Unclassified (cloud cover)				6

### 1.6.2 Cover changes and biodiversity

The study also showed that the forests in Masha and Anderacha *Woredas* are very rich in plant species composition. Around 190 species were recorded from forests in Masha *Woreda* bordering the tea plantation, *i.e.*, in Uto, Sato,

Gatira and Chewaka forests. Similarly, around 180 species were recorded in Gemadro forest, bordering the Gemadro coffee plantation. A total of 80 and 72 plant species were recorded in five study plots of the forests around Masha and Anderacha, respectively. The mean numbers of species recorded per plot were 32 and 27 for the two forest areas, respectively. The study areas are very important for threatened species like *Prunus africana* and rare and endemic species like *Canarina abyssinica*.

The local community has very high dependency on several species of plants in the forests. Most of the plant species recorded in all areas have one or more types of local uses. The major non-timber forest products (NTFPs) used in Masha and Anderacha *Woredas* are food, fodder, local construction materials, medicine, spices, honey, farm implements, household furniture and fuelwood. Honey is the major NTFP for income generation.

Conversion of forests to other landuses has significantly reduced the diversity of plants. Forest areas cleared by the EAA Company were converted to monocultures of tea and eucalypts plantations. This is the most devastating in terms of reducing diversity, even more than agriculture. Farmers normally leave trees of diverse species on agricultural plots, mostly on farm plot boundaries. On agricultural landscapes, steep slope areas are always kept under forest cover. However, on tea plantations, even steep slopes are cleared and planted with eucalypts for fuel.

Compared to other coffee production systems in Ethiopia, the Gemadro coffee plantation is very destructive, almost similar in its effect to conversion in to cereal crop based agriculture. In traditionally managed forest coffee in SW Ethiopia, about 300 trees/ha of diverse species are left as shade trees. In Gemadro, however, not more than 20 shade trees/ha, representing very few species of native trees, are left as shade trees for coffee. Most of the native trees have been cleared and given way to exotic species like *Sesbania sesban*, a temporary shade tree during coffee establishment. Farmers and smaller investment projects are picking up the practice of conversion of natural forest to coffee plantation. Since maximizing coffee production is the main goal, high yield cultivators that are less dependent on shade are used for plantation establishment.

### 1.6.3 Culture and natural resources management

The communities in two *kebeles* around the EAA tea plantation were the focus of the culture and natural resources management case study. The communities in the area have strong relation with their environment, and

hence have developed their own conception of resource management. For the Sheka people, forest is everything they need: it is source of several NTFPs, especially honey, spices and construction materials; it is habitat for wild animals that are hunted for food; it is religious site where they worship; it is their graveyard; it is property to be inherited by descendants.

Forestlands in the study area are divided into cultural forests and large forest areas that are administered through the *kobo* customary right. The management of the two differs from in two aspects: (1) cultural forests are found around villages and on hilly or mountainous areas while *kobo* forestlands are found relatively far from settlement areas; (2) the management of cultural forests is based on the resource and habitat taboos, while the management of *kobo* forests is based on the rights and obligations of the individual who inherited the forestland from his ancestors.

Cultural forests, wetlands, riverine forest and waterfalls are traditional religious sites and hence protected by imposing resource and habitat taboos through the *guudo* (cultural forest used as worship place) and *deddo* (large tree under which prayer or religious ceremony is conducted). The Shakichos strongly believe that there is a relationship between the wetlands, rivers and forests in their environment. Wetlands are sources of rivers and forests that keep both from drying, *i.e.*, the natural forest along river banks, waterfalls and wetlands are the base for rivers. Their resource management concept is basically based on maintaining such interrelationships sustainably. Their social organization makes possible to manage the different categories of the environment. It provides different responsibilities of resource management to the people along their traditional layers starting from the king (*Shekitato*) down to individuals and groups at grass root level. Clan leaders (*gepitato*) are administrators as well as ritual leaders. They allocate land to new-comers and “purify” the people. The pervasiveness of traditional belief systems that imposes resource and habitat taboos contribute to the conservation of natural resources, specifically wetlands and forests.

Recent changes in institutions, forest cover and religion had brought a significant change in peoples’ perception towards forest resources and resource management. Previously, both customary and government forest management were in the hands of clan leaders. Clan leaders had the right to enforce compliance to taboos and restrictions related to the cultural forest. Clan leaders also imposed punishment on people involved in cutting trees. Nevertheless, deforestation has been aggravated since 1997 as result of demarcation of forests, including cultural forests, as state forests. Large forest areas (*Kobo* land), cultural forests (*guudo*), burial places, wetlands and

riverine forests along the Baro River have also been given for investment in tea plantations. Such tabooed and respected sites were bulldozed in front of their eyes, which has degraded their values, belief systems and feelings of responsibility. The farmers lost their *Kobo* forestland without compensation. After loosing their main source of income, some migrated to Oromia for shared honey production, and some became daily laborers on the tea farms.

Cultural changes due to immigrant workers have also brought several social and economic crises. Theft, murder and related crimes have become common, as there are people with unknown background coming to the plantation area. Transmission of various epidemics, marriage dissolution and family disintegration are highly increasing. Stealing honey and bee have become common phenomena, which threatens the traditional *kobo* management.

Forest management role of clan leaders have gradually decreased due to conversion of the majority of the people into Protestant Christianity. Followers of the Protestant Christian religion do not accept the practice of the clan leaders such as swearing, cursing, rituals and sacraments related with worship that contribute to resource management. The conversion of people into protestant Christians has a serious impact on the traditional resource management practices. Cultural forests, wetlands, and riverine forests that were conserved through the traditional beliefs for centuries are endangered due to the new belief systems.

#### 1.6.4 Legal and institutional framework

The legal and institutional analysis looked at international conventions, federal and regional policies, laws and institutional arrangements and the practices of such laws, particularly in Sheka Zone. Ethiopia is not signatory to some international conventions which are specifically meant to address the plights of local communities. Ethiopia is not party to both the 1957 and 1989 ILO Conventions, which are legally binding instruments. No African state has so far ratified the 1989 ILO Convention 169. Generally, various international human rights instruments have provided collective rights in the form of 'minority rights', 'peoples' rights' and 'indigenous rights'. Ethiopia has adopted a constitution in 1995 that provides constitutional guarantee of the right of 'nations', 'nationalities' and 'peoples' up to self-determination (Article 39 of the 1995 FDRE Constitution). From this basic premise one can hardly assume that the right of peoples are vested in the state and are exercised only by the government of the state. The Ethiopian Constitution

also vested the right to land ownership in the state and in the nations, nationalities and peoples of Ethiopia. It is thus paradoxical that in Ethiopia, with regard to land ownership, the state is the sole owner disregarding the constitutional rights of the people.

In international instruments such as the ILO Convention 169 of 1989, there are various rules and principles which are aimed at protecting the environment and ensuring sustainable development; and have clearly recognized the rights and interests of indigenous and tribal communities related mainly to their lands.

International human rights documents, as in Article 27 of ICCPR, also have recognized, directly or indirectly, the collective rights of local communities. Various international environmental documents also reflect the inter-relationship between the rights of local communities and protection of environment. Ethiopia is also party to almost all those documents except the ILO Convention 169. This country signed and ratified the Convention on Biological Diversity on 10 June 1992 and 5 April 1994, respectively. According to the 1995 Ethiopian Constitution, international agreements signed and ratified by the Government are part of the laws of the country.

The FDRE Constitution emphasizes on the rights of nations, nationalities and peoples. Some of the Nations, Nationalities or Peoples can be well taken as indigenous peoples and/or their local communities. Many of the Nations, Nationalities and Peoples of Ethiopia fulfill the definition of Indigenous Peoples as provided by the ILO Convention 169 of 1989. The FDRE Constitution can be cited as a peculiar constitution in recognizing collective or group rights. A key characteristic generally ascribed to collective rights is the communal and solidarity outlook of the peoples, which is recognized in Article 39(5) of the Constitution. The recognition of collective ownership of communities over land by the FDRE Constitution has thus a remarkable significance in promoting the right to sustainable development of such peoples or communities. The resource management knowledge of these people is collective and intergenerational. This has contributed to conservation of biodiversity in areas inhabited by indigenous and traditional peoples. In Ethiopia most of the natural forests and biodiversity rich sites are also home to indigenous communities with diverse cultures. Recognizing the cultural rights and communal land ownership of these communities is a crucial step to maintain these sites for current and future generations.

However, some federal laws seem to be in contradiction to the provisions of the Federal Constitution. As indicated under Article 2(12) of the Federal

Land Proclamation, it is the state that gives rural land to local communities, which is a clear retraction of the constitutionally guaranteed land ownership of communities. Under the Constitution, the State and the Nations, Nationalities and Peoples of Ethiopia own land. The Constitution did not give more right to the state than the Nations, Nationalities and Peoples. The Federal Rural Land Proclamation, however, is enacted in the sense of denying the communal land ownership of the Nations, Nationalities and Peoples.

The Federal Rural Land Proclamation has failed even to consider communal land as it is prescribed under the ILO Convention 169, in the territorial sense. According to the ILO Convention 169, the rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognized. Accordingly, the rights of the indigenous community to use areas which they don't exclusively occupy, but to which they had access traditionally for their subsistence and traditional activities must be respected. This is the territorial right of peoples, which is not merely restricted to the land which is occupied by them. It also includes rights over the landscape, mountains and rivers. A close look to the provisions of the Federal Rural Land Proclamation clearly reflects that the land given by the government to the local communities for grazing, forestry and other social services is fragmented land rather than a continuous territorial land.

In the Federal Forest Policy (Proclamation No. 94/1994), three types of forest ownership are recognized – 'state forest', 'regional forest', and 'private forest'. A state forest is a forest designated as such by a regulation to be issued by the Council of Ministers, upon the recommendation of the Ministry so as to protect the genetic resources and the forest ecosystem with a program that may cover more than one regional state. However, no regulations have been made by the Council of Ministers to this effect and, therefore, no designations have been made. As a result, it has become very difficult to identify which forests belong to the Federal State and which ones would belong to the regional states.

The Federal EIA (Proclamation No. 299/2002) clearly puts that investment project proposals should include environmental study report, which has to be evaluated critically by the Federal Environmental Protection Authority and mandated regional government organs before implementation. The practice of EIA, however, is weak for two major reasons: (1) lack of capacity; and (2) the EIA law is prevailed by the later investment law (Investment (Amendment) Proclamation No. 375/2003).

The capacity of EPA to conduct reviews on all environmental impact study reports under its jurisdiction is questionable. The Authority does not have long tentacles to regulate each and every activity. In principle, reviewing of the environmental impact study reports developed by investors or project owners have to be done by the Authority in coordination with the regional authorities. However, EPA is unable to conduct the review process together with Regional Environmental Protection Authorities and federal sectoral organs due to lack of capacity.

The amended investment proclamation considers EIA as a process introduced to act against development activities. Hence, it has reversed EIA procedure, and today the practice is that the Ethiopian Investment Commission or the Regional Investment Bureau (or the appropriate investment organ), after issuing the investment permit, notifies the concerned government institutions so that the latter conduct the necessary follow up. EIA is thus no more a prerequisite for investment project implementation.

Relevant laws are even much more in contradiction with the Federal Constitution at the level of regional states. The SNNPR Rural Land Administration and Utilization Law (Proclamation No. 53/2003) defines government holdings as land demarcated and held by government which includes large forestlands, wild animals, parks, mining, lakes and rivers. Almost all important lands are held by government and the communal holdings are fragmented lands, except for the pastoralist lands, which are used by the local communities for various purposes. This is far from the communal land ownership right recognized by the FDRE Constitution and the international instruments including the ILO Convention 169. The SNNP Land Administration Proclamation does not consider the territorial concept of land ownership by the local communities. The SNNP Regional Forest Management, Development and Utilization Law (Proclamation No. 77/2004) does not even recognize community forest as opposed to the case in Oromia (Oromiya Forest Proclamation No. 72/2003).

The study also revealed that institutional settings in Sheka Zone are not well organized, and lack capacity to involve people in decision-making regarding allocation of land to investors. There is a total mismatch of duties and responsibilities of institutions and the actual practice on ground. Even though the Regional Constitution has vested important powers of government to the grass-root level, the responsibilities of *woredas* in Sheka are limited to implementation of the decisions of the Zonal Administration. The role of *woredas* regarding investment is mainly limited to providing security and protections to investors against any act that might hamper their



activities. In general, the major problem at local level emanates from the confusion as to who does what in Sheka Zone.

#### 1.6.5 Values of the forest

To quantify the net benefits of the natural resources of Sheka Forest, the concept of total economic value (TEV) was used. For estimating the TEV of a forest, values are categorized as use and non-use values. Use value can be further classified as direct and indirect use values and the non-use values in to option, bequest and existence values as explained in Chapter 6. In general, TEV of a natural forest refers to the monetary value that individuals generate as use value and the amount that stakeholders are willing to pay for non-use values of the natural forest, if it were to remain as before the intervention. The economic valuation study of Sheka Forest indicated that on average, sampled households generated about 44 per cent of their income from forest and forest products. Direct use value of the natural forest for house construction, furniture, utensils, farm implements and for fencing purposes was estimated to be Birr 89 per ha per annum, while the value of NTFPs from the forest was estimated to vary from about Birr 1,192 per hectare, based on current extraction level, to Birr 8,142 per hectare under exploitation of the potential of the natural forest with zero management. It is interesting to note that when scaled up to the size of the forest the use value of the natural forest in the form of non-timber forest products, under the traditional production system, is about two fold of the net benefits from land allocated to investment in tea plantation.

The bamboo forest of Sheka covers about 13,552 ha. A hectare of bamboo is known to have from 100,000 to 150,000 bamboo stands. Taking four years as optimum harvesting age for house construction, fencing and to make beehives, and Birr 2 as local market price per matured bamboo plant and 20% as cost of harvesting, under sustainable extraction, the total net direct use value of bamboo forest in Sheka is estimated to be between Birr 542 to 813 million per annum.

An interesting component of the study was the carbon sequestration value of the forest. In closed primary forests it is estimated that about 280 tones of carbon per ha may be stored, while secondary and open forests store about 194 tones and 115 tones per ha, respectively. On the other hand, whereas open forests may loose between 29 tones to 38 tones of carbon when converted to shifting and pasture/permanent agriculture, respectively, conversion of closed primary forests to agriculture may release up to 200

tones of carbon per hectare. Taking a conservative figure of 10 USD/ton of carbon (see Chapter 6), *i.e.*, about Birr 85 at current conversion rates, the carbon storage value of the Sheka Forest was estimated to be about Birr 1.6 billion. It is important to note that this economic value of the natural forests as carbon storage will be lost with loss of the forest. On the other hand, cost of conversion of Sheka natural forest to tea/coffee plantation in terms of carbon storage is estimated to be about Birr 3,400 to 17,425 per ha based on type of natural forest.

## 1.7 Conclusions

The Sheka Zone is one of the few areas in Ethiopia with high forest cover. Currently, about 47% is estimated to be covered by forest. In recent years, however, the rate of deforestation is increasing at an alarming rate, which is threatening the forest biodiversity, ecosystem, pristine habitats and the livelihood of the local community. The forest in the area has very diverse plant species. The local communities use almost all plant species for one or more purposes. They are heavily dependent on forests for different NTFPs, mainly honey, spices, local construction materials, medicine, food, fodders and fuelwood. Such heavy dependency on forest has contributed to the maintenance of higher forest cover in the areas for centuries. The Sheka community had strong social structure which sets administrative rules and regulations, resource management rules and religious taboos and values with regard to the environment. The Sheka people also had forest or tree tenure system in which a family owns and inherit forest areas for honey production to descendants.

The increasing trend of the rate of deforestation can partly be attributed to cultural changes, investment in plantations and government policies and laws. Cultural changes came about mainly due to changes in the belief systems of the community and the impact of settlers and immigrant worker of the plantations. Conversion to Christianity has degraded the values and taboos that people had for cultural forests and other sensitive habitats, and decreased the use of traditional medicine. Increase in the population of settlers in towns has increased demand for fuelwood; and hence the tradition of selling fuelwood has emerged.

Government policies and laws have stripped off the customary rights of the local communities to use and manage forestlands. Cultural forests which the community use as sacred grooves for religious practices and burial purposes

have also been declared as state forests. Forest areas previously managed by individual members of the community as *kobo* lands for honey and other NTFP production, and cultural forests have been given to investors of tea and coffee plantation without the consent of the community. *Kobo* owners were also not given compensations for the lost property and land.

Both the federal and regional policies failed to respect the rights of the nation, nationalities and peoples of Ethiopia stipulated in the Federal Constitution and international conventions. Some of the federal and regional laws contradict the Federal Constitution and international conventions as is the case with the Federal Land Proclamation and Regional Rural Land Administration and Utilization Law. These proclamations put government as the sole owner of land; and the one who gives, takes away and passes over as needed. Under the Federal Constitution, however, the State and the Nations, Nationalities and Peoples of Ethiopia own land. The Constitution did not give more right to the State than the Nations, Nationalities and Peoples.

Other laws like the amended Investment Proclamation (Proclamation No. 375/2003) prevailed over the EIA law (Proclamation No. 299/2002). The latter required that investment project proposals should include environmental study report, which has to be evaluated critically by the Federal Environmental Protection Authority and mandated regional government organs before implementation. According to the new Investment Proclamation, EIA is not required before investment, and the Ethiopian Investment Commission or the Regional Investment Bureau (or the appropriate investment organ), notifies the concerned government institutions so that the latter conduct the necessary follow up, after issuing the investment permit.

These policy and social problems are further compounded by poorly organized, inefficient institutions to implement even these policies, and a total mismatch of duties and responsibilities of institutions. Given such poor institutional setup and poor follow up, companies given forestland like the EAA are clearing forest areas far beyond their designated boundary, and encroaching sensitive habitats like wetlands and riverine forest vegetation previously protected by the local communities.

## **1.8 Recommendations**

Very specific recommendations have been provided under all of the chapters to follow. In general the following measures are recommended to be taken:

1. Classification and delineation of all areas into different landuse categories based on their ecological sustainability, potential for economic uses and social justice;
2. Recognition of the customary rights of the local community over their lands, their life style that strongly depends on forest, and the crucial contribution of their knowledge for sustainable use, incorporation of such issues in relevant federal and regional laws;
3. Promotion of alternative energy sources and income generation mechanisms to reduce deforestation related with fuelwood consumption;
4. Revision of the Federal and Regional policies and laws to make them compatible with the Federal Constitution, to ensure the rights of local communities to their land and environment;
5. Respect the constitutional right to participation and the responsibility for forest management of local communities and local institutions;
6. Rectify the conflicting positions of different laws such as the EIA law, Investment law and the Penal Code provisions;
7. Enact the EIA law and build capacity to implement it. The environmental study prior to investment should also include the agreement of the local community as a main requirement;
8. Investment projects already licensed should be assessed, their impacts on biodiversity and local livelihood evaluated, and corrective measures taken to avoid further damages;
9. Give priority to investments that are environmental friendly and socially acceptable such as ecotourism, honey and spices production.

## 2 Landuse/landcover changes in Andracha and Masha Woredas of Sheka Zone, SNNP Regional State

Bedru Sherefa

### 2.1 Summary

Ecologically and socially aware investment that is based on a properly studied landuse plan is the backbone of many successful economies. When it comes to allocating the physically and potentially last remaining natural forest for investments, several factors that are more than mere financial benefits need to be involved in decision making. Unfortunately this does not seem to be the case in the Andracha and Masha *Woredas* where some of the remaining forests of Ethiopia are located. This study concentrated on four *kbeles* in Masha *Woreda* and one *kbele* in Andracha where tea and coffee plantations are affecting the landcover/landuse, respectively.

In this work, the landcover/landuse change process induced by investments for tea plantation and large-scale coffee farms has been analyzed emphasizing on: 1) mapping deforestation and forest degradation processes in time and space, 2) identifying the many responsible factors in degradation processes and quantifying the impact of each agent across time, 3) providing clues pertaining to the restoration potential of degraded and deforested lands. Historical and current satellite image analysis was the core of this landcover change study. Accordingly, Landsat images of 1973, 1987, 2001 and 2005 were procured for contemporary landcover mapping after passing through routine image enhancement and correction procedures.

The net annual forest loss was found to have increased dramatically after the mid 90s around the four target *kebeles* in Masha *Woreda*. From 1973 to 1987 the annual forest loss from the available forest resource base of the *kebeles* was only 0.2%, 0.27%, 0% and 0.15% in Welo, Uwa, Beto and Keja-Chewaka, respectively. Since 2001 the rate of net forest loss has increased to 1.6% in Welo, 1.3% in Uwa, 0.5% in Beto and 4.3% in Keja-Chewaka where there was a major impact. From the 2900 hectares of dense forest detected in 1973, only 814 hectares remained the way they were with some additional 1300 hectares in disturbed condition in Keja-Chewaka *Kebele* alone. The same trend holds true for the other three affected *kebeles*. Under normal local land management practice, large-scale clear cutting has never been practiced. Such practice has not been observed in any of the satellite images analysed. The landcover changes observed were only cyclical in nature in areas where tea plantation had no influence or in the period prior to the existence of the tea plantation project. The 'Kobo' system always

maintained an environment where nature was conserved and sustainability of honey production was ensured.

Unlike the vast indiscriminate clearing of pristine forests by the Chewaka-Uto Tea Plantation Project, spontaneous and widely scattered pockets of deforestations and forest degradation were observed in Gemadro. There is a growing enthusiasm by small traders and merchants to grab as vast land as they could get hold of in Gemadro *Kebele* and its surrounding. This has been induced by windfall coffee market. The impact inflicted to the environment has not been the result of the coffee plantation estate alone. The local people have mixed feelings as they are benefiting monetarily in short terms and harbouring a deep concern about the long term sustainability of converting forest to coffee farms. In sharp contrast to the Chewaka-Uto Tea Plantation, there is no ill feeling about the Gemadro Coffee Plantation, neither among the local population nor by the administration and officials. However, a 12.2% annual rate of net forest loss since 2001 is an alarming trend.

None of the investment groups have been found to show any regard to the ecosystem integrity of the area. The coffee plantation has shown some sign of stabilizing potential. The tea plantation, on the other hand, simply expands towards the edges of primary forests. To make things worse, the ground limit of the latter investor group is not clearly known. Under such blurred ownership, the management of the tea plantation chose to exploit the situation by bulldozing the forest freely and anarchically, as many hectares as possible before it is mapped and delineated. Unfortunately no responsible body is trying to give a critical look into this lawlessness and now the spatial location of this tea plantation extends way beyond the 'guide map' the Zonal Administration knows and the 'free hand sketch' the investment group itself has drawn. This land grabbing haste is a clear indication of the investors' intention to profit from the extensive exploitation of natural resources conserved for generations by the local people instead of increasing efficiency and promotion of intensive landuse.

According to the Ethiopian Agricultural Sample Enumeration Report by the Ethiopian Central Statistical Agency (2001), the number of beehives in Masha and Anderacha *Woredas* is 38,115 and 25,726, respectively with an annual production of over 520 thousand kilograms. This amounts to 57 and 66 beehives per square kilometre of open forest, dense and closed forest put together or 101 and 90 beehives per square kilometre of dense and closed forests in Anderacha and Masha *Woredas*, respectively. At an average productivity of 8.4 kg per beehive per year, the importance of honey production alone for the livelihood of the rural poor is evident in this region. Any vast destruction of forest resources by external bodies therefore exacerbates rural poverty through the destruction of their livelihood strategy that coevolved with the forest itself.

## 2.2 Introduction

### 2.2.1 Background

The change of states from one form to another is a natural phenomenon to both biotic and abiotic components of our planet. The duration of the episode is, however, quite relative and varies from one entity to another. In the absence of excessive human interference, natural forests of tropical region exhibit little conspicuous spatial change in short period of time. The natural potential to restore to its former state through succession is always there when some sort of natural change happens.

There are several living evidences that prove that Ethiopia was once largely covered by forest. Today, vast primary forests are located in areas that are not physically accessible (MOA 1990; EFAP 1994) or in areas where generation of traditional ecological knowledge has helped the conservation of forests. The Sheka Administrative Zone is a typical example of the latter. Moreover, there is a strong economical reward in conserving the forest through beekeeping (Hartmann 2004). Until investments in plantations came to this area, the traditional forest management system was relatively sustainable and had enabled the conservation of the forest for generations.

Ecologically and socially aware investment is the backbone of many healthy economies. To alleviate poverty and improve the quality of life of its citizens, Ethiopia needs a lot of such investments (FDRE 1997). However, investment initiatives that try to benefit through exploitation of important forests that have been preserved for generations not only put the local people in disadvantage but also bring little change to the overall economy of the country (Burge 1998). The landcover/landuse change process induced by the investments for tea plantation and large-scale coffee farm is analyzed in this work. Both the coffee and tea plantations gave little attention to the forest ecosystem. In this chapter, changes in landuse/landcover during the past 30 years, with more emphasis on the recent changes around the coffee and tea plantations in Anderacha and Masha *Woredas* of the Sheka Zone, are presented.

### 2.2.2 History of forest cover change assessment in Ethiopia

Even though arguments run around its extent, it is widely believed that by the turn of the last century, a large portion of the country had been covered by high forest formations (Brietenbah 1962, Chaffey 1980, EFAP 1994, EHRS 1985). Reliable and accurate information about the forest cover and condition of Ethiopia are scarce and usually very hard to find. According to Forest Resources Assessment 1990 (FAO 1993), the forest cover of Ethiopia was 12.9%. The Forest Resources Assessment 2000 reported a very high loss

in less than a decade, putting the country's forest cover estimate in 1997 to only 4.2% of the total land surface (FAO 2001).

There is also a large discrepancy in the estimation of the rate of deforestation in the country. According to the Conservation Strategy of Ethiopia, the annual rate of deforestation is in the range of 150,000 and 200,000 hectares (MoA 1990, EFAP 1994, FDRE 1997). On the other hand, the Forestry Action Plan of the Southern Nations and Nationalities People Regional State puts the annual deforestation rate as a range between 80,000 and 200,000 hectares (SNNPRS 1999), which is too broad to be considered credible. To add to the confusion, FAO (2001) puts the estimate of the annual rate of deforestation at 38,600 to 40,000 hectares per year. Thus, the size, quality and dynamics of Ethiopian forests are largely unknown (MWR 1995).

In most literature, the forest cover of Ethiopia today is reported to have dwindled to only 2–3%. The presence of remnants of high forest trees in the compounds of churches and cemeteries, probably indicate past climax forests. Such indicators can be found in many places in the monasteries of central and northern Ethiopia, where forests have long been lost, and the surrounding areas are severely degraded.

## **2.3 Objectives**

The present work had the following main objectives:

- mapping deforestation and forest degradation processes in time and space;
- identifying the main responsible factors of degradation processes and quantifying the impact of each agent across time; and
- providing clues pertaining to the restoration potential of degraded and deforested lands by showing the permanency or temporal nature of degradation footprints.

## **2.4 Methodology**

### **2.4.1 Satellite image processing**

#### *2.4.1.1 Image selection*

Image selection was one of the most difficult processes as the Masha and Andracha areas have considerable cloud coverage with a whole year round rainfall. Effect of image coverage loss due to clouds had to be worked out. Two sets of cloud free images; February 1987 and 2001 as well as partially clouded images of January 1973 and March 2005 were used in this analysis.



Satellite images of 1987 and 2001 have been used to generate landcover data for all *kebeles* in the two *woredas*. Images of the others period have some cloud some where in the images. However, all images from 1973–2005 have been used to extract data for the sensitive areas around the four *kebeles* that are affected by tea plantation and the Gemadro coffee plantation areas. Successive landcover change processes have been identified accordingly.

#### 2.4.1.2 *Ground verification of field assessment*

A 10-day fieldwork was conducted to collate ground information and gather perception of local peoples and official view of the current landcover change. Sufficient numbers of randomly distributed sample plots were selected for ground observation and pertaining landcover data were collated (Congalton 1988). A series of discussions were held with the Sheka Zone Offices of Investment and Agriculture and Rural Development, as well as with their respective *woreda* offices in Masha and Anderacha. Available documents and maps that could shade light on historical dynamics of the Sheka Zone forest cover were collected.

#### 2.4.1.3 *Image enhancement*

Comparing images of different periods requires a series of image enhancement activities (Hoffer 1986; Lillesand *et al.* 2004). All images were individually geocoded and georeferenced. This ensures the proper alignment of image analysis products to widely available map products as well as proper utilization of EMA's topographic maps as inputs. Sufficient radiometric equalization had been performed in order to minimize misidentification problems during signature generation for older images (Schowengerdt 1997).

#### 2.4.1.4 *Classification*

Before full-fledged classification was made, the issue of segmenting and masking known and little changing landcover classes was settled. Bamboo forests with their peculiar spectral signature at altitudes above 2300 meters and wetland classes were similar in size and location in all images. These classes were masked out as supervised classification that employs the Maximum Likelihood algorithm. The algorithm clusters together landcover classes based on the field observation data. The classification process was designed in such a way that nine landcover classes, that are pertinent to the objective of this study, might be identified. The spatial extent and location of these thematic classes that cover the whole Andracha and Masha *Woredas* was established for 1987 and 2001. Only the focus four *kebeles* where tea plantation has strong impact and the Gemadreo *Kebele*, where the coffee estate farm is located, were found worth classifying from cloud

contaminated images. Consequently, landcover classes of 1973, 1987, 2001 and 2005 were successfully modelled for the core study areas.

#### 2.4.1.5 *Overlay analysis*

Landcover changes and major factors of change processes are entirely identified through overlay analysis in GIS. Classified landuse maps from two periods were cross-registered with "Boolean AND" operator. The processes resulted in several polygons with attribute table showing its initial landcover class and the new landcover class. In addition to producing 'change process' maps, a series of tabulated data were generated from the resulting new attribute tables.

#### 2.4.1.6 *Topographic analysis*

The Freely available Synthetic Radar Topographic Mission (SRTM) digital elevation model was acquired for this study. After the routine geometric correction, elevation and slope classes were determined to use for classification and erosion hazard mapping. Part of the resulting tabular data was included into the geodatabase for further use.

#### 2.4.1.7 *Geodatabase*

The above mentioned GIS activities resulted in a series of tabular data. Other data were also organised from field observation, literature and expert opinion. These tables needed to be linked with maps in order to observe them in spatio-temporal dimension. An interim geodatabase was constructed that facilitated analysis, final mapping and proper legend creation (Figure 2.1). A series of tabular and map products were finally generated as eventual results.

### 2.4.2 Definition of landcover classes

#### 2.4.2.1 *Forests:*

- a. **Dense forests:** These are dense and closed canopy forests with no or little disturbance. Shade tolerant understorey plants and climbers are associated with these forests.
- b. **Closed forests:** These categories of forest are with a canopy closure of more than 70%, but exhibit anthropogenic interferences. Small open-ups, abundant pioneer tree species, occurrence of beehives on tree branches and some traceable footpaths are some characteristics of these forests. Significant forest utilization for wood products is not a common practice.
- c. **Open forests:** The canopy is very open and permits undergrowth of grasses or shrubs. Only forest patches with size of at least 0.5 hectares and open canopies were categorized as open forests. These

forests have been utilized for wood and wood related products extensively. Spatially insignificant patches of Enset (false banana) farms are not uncommon here.

- d. **Bamboo forest:** Forest class highly dominated by alpine bamboo.

#### 2.4.2.2 Agriculture

**a. Agriculture and tree patches complex:** Neither agriculture nor tree aggregation dominates the landscape. It is like unintentional agroforestry practice. With removal of human interference, this class quickly changes to forest classes. Enset based agriculture might have been misclassified into this class.

**b. Agriculture:** Spatially continuous small household agricultural farms are included in this class. Trees in small gardens and fences are left in these classes unless they are spatially big enough to be considered in the class Agriculture and tree patches complex.

**c. Exposed soil:** Unless it is freshly cultivated land or heavily grazed area, the weather condition in this area does not allow the occurrence of purely exposed soil. Therefore, this class may have a landuse category of agriculture. However the landcover class is categorized under exposed soil/land.

#### 2.4.2.3 Others

- a. Tea Plantation: spatially contiguous vast areas modified for or converted to tea plantation.
- b. Wetlands: marshes, impassable swamps and lakes are categorized together as wetlands.

### 2.4.3 Categorization of landcover/landcover change process

**Deforestation:** Landcover changed from forest classes to non-forest classes

**Deforestation for Tea Plantation:** former forest landcover classes are converted to tea plantation

**Forest Degradation:** A higher forest class is reduced to lower forest quality class. *E.g.*, dense forest to open forest.

**Forest Disturbance:** A dense forest is converted to disturbed but still closed forest.

**Forest succession/Woody plants regeneration:** when formerly non-forest classes change into one of the lower forest classes. Pioneer tree species like *Croton* dominate such forest.

**Modification to similar agriculture based landcover:** conversion of open field to agriculture and vice versa.

**Undefined:** unknown changes due to cloud blocking of one of the images or due to misalignment of two images around their edges.

**Restoration:** In this process, a lower quality forest class moves up to high quality forest classes or attains ultimate forest climax.

**No change:** No significant change is exhibited in the given period.

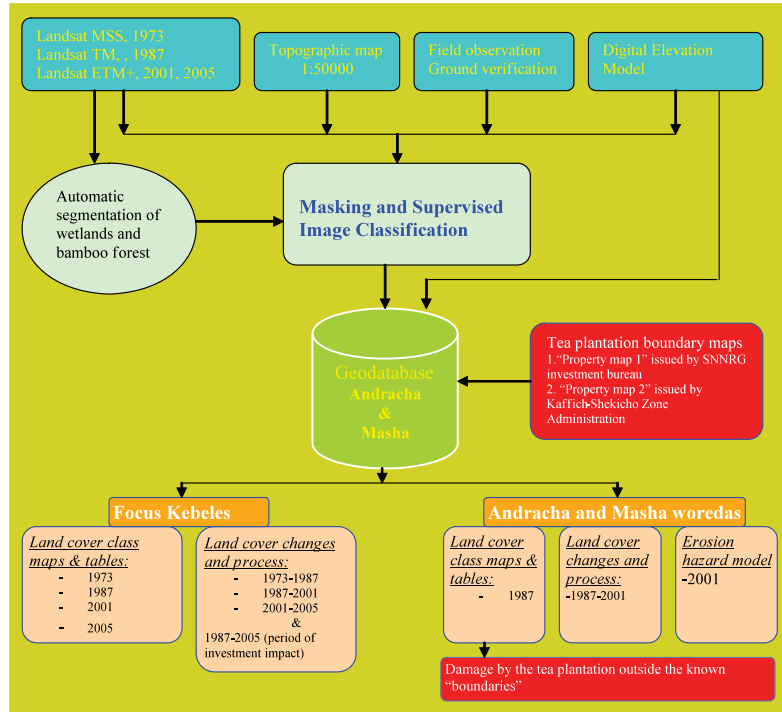


Figure 2.1 Summary of the methodology followed for spatial analysis

## 2.5 Results

### 2.5.1 Spatial extent of landcover classes

Spatial magnitude of all landcover classes and quality status of forest cover classes were determined in two levels. The entire areas of the two *woredas* that contain the target investigation sites were assessed to get perception of landcover change process under normal condition. The site specific and intensive assessment of the tea plantation site and the coffee plantation site were done in five *kebeles* where the impact is direct and intensive.

#### 2.5.1.1 The two woredas

Only the 1987 and 2001 landcover classes were determined for the entire *woredas* due to cloud cover in the source satellite images (Figure 2.2). However, essential landcover classes and landcover change trends were

extracted from the two clear satellite image data sets. The generalized figure of landcover classes is given below (Table 2.1). See Appendix 1 for further details about individual *kebeles* in the two *woredas*.

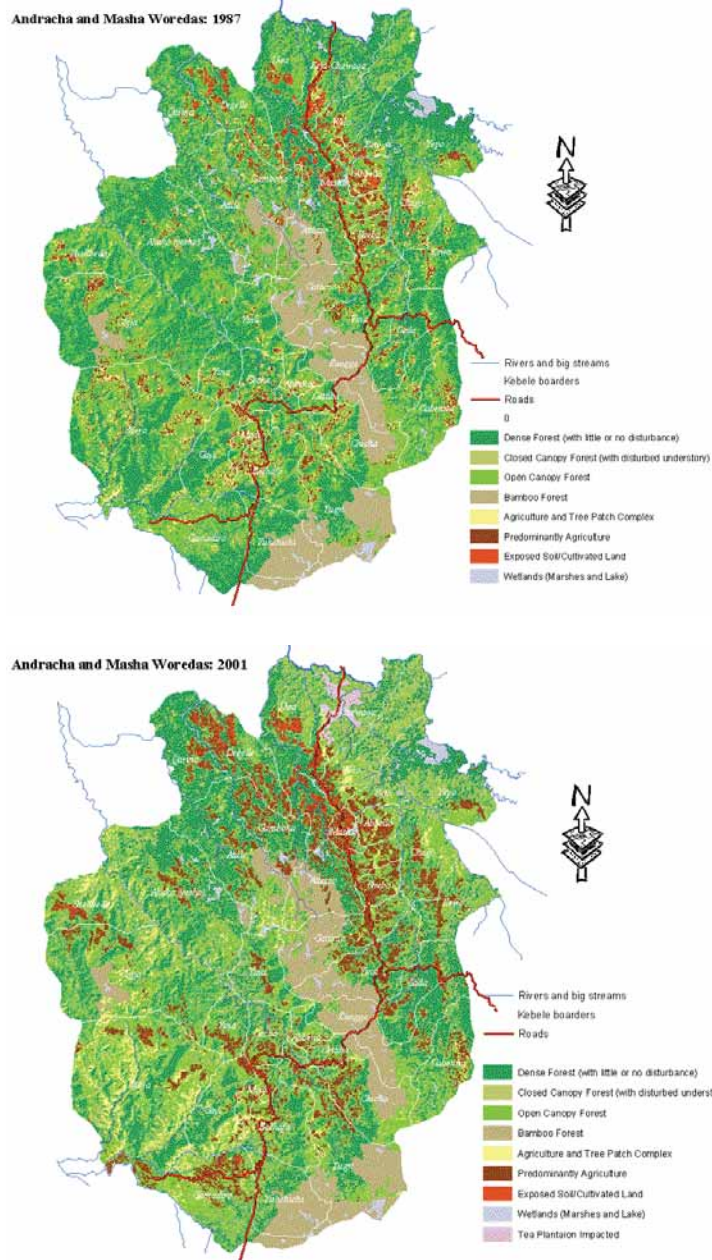


Figure 2.2 Landcover class maps of the two *woredas* in 1987 and 2001

Table 2.1 Two period landcover classes for the entire two *woredas*

landcover classes	1987		2001	
	Area in ha	%	Area in ha	%
Dense closed forest	55304.5	39.0	43423.9	30.6
Closed forest (disturbed)	8015.0	5.6	24369.7	17.2
Open forest	46593.7	32.8	35077.4	24.7
Agric/tree mosaic	6858.6	4.8	6675.4	4.7
Agricultural lands	8619.7	6.1	14672.5	10.3
Exposed/cultivated	1228.3	0.9	1793.2	1.3
Bamboo forest	13466.5	9.5	13552.1	9.5
Wetland	1890.6	1.3	1640.7	1.2
Tea plantation			758.2	0.5

A drop in the magnitude of dense forest was observed in almost all *kebeles* of the entire two *woredas*. However, this decline is largely explained by increase in the magnitude of disturbed closed forests and restoration of some abandoned degraded forestlands. Agricultural land for crop production had almost doubled within the 14 years study period. The area coverage of bamboo and wetland classes had changed very little during the study period.

#### 2.5.1.2 Target *kebeles*

##### I. *Kebeles* around the East African Group Tea Plantation Sites

According to boundary sketch maps issued to the East African Holdings by different administrative bodies at different times, four *kebeles* are directly affected. These are: Uwa, Keja-Chewaka, Welo and Beto. Like the rest of the *kebeles* in the entire Masha and Andracha *Woredas*, these four *kebeles* are also experiencing a drop in quality of dense forest. Unlike the other *kebeles*, the open forests in Keja-Chewaka *Kebele* are being deforested at an alarming rate. It is in this *kebele* that the tea plantation activities are taking place at the moment. Uwa and Beto are not currently affected by the tea plantation. However, some parts of these two *kebeles* were included in the boundary maps of the plantation (Table 2.2). The graphical representation of Table 2.2 is given in Figure 2.3a and b. The exact locations of historical and current landcover classes are shown.

##### II. Gemadro *Kebele*

Except for high altitude areas dominated by bamboo, the Gemadro *Kebele* is thought to be influenced by the large estate coffee plantation. To this end, a

four period landcover/landuse assessment was made. A drastic decline in dense forest due to wide spread cutting of large and dense crowned trees, openings of the crowns as opposed to clear cutting manifests deforestation here. It has led to gradual influx of small scale coffee growers in the area following the Gemadro Coffee Plantation. Between 1987 and 2001, there was extensive decline in canopy coverage, as vast area of the Gemadro *Kebele* was deforested. By 2005 large part of these lands were covered with coffee and shade trees. However, some disturbed closed forest in 2001 has shown a recovery in 2005 (Table 2.3 and Figure 2.4a and b).

Spatial distribution of landcover classes have been largely guided by elevation. Dense forest in areas between 1000 and 2000 meters altitude were virtually converted to open forest where they can serve as coffee shade.

**Table 2.2 Changes in extent of land (in hectares) cover classes in the four *kebeles* affected by the Chewak-Uto tea plantation project**

<i>Kebele</i>	year	DCF	CF-d	OF	ATM	Agri.	EC	W	TP
Welo	1973	4113		1629	193	640		76	
	1987	3158	643	1782	210	588	211	61	
	2001	2212	1895	1212	213	816	251	53	
	2005	1355	2207	1423	150	852	537	54	76
Uwa	1973	1664		909	8	147		2	
	1987	1294	245	938	32	136	83	2	
	2001	974	732	577	67	193	184	2	
	2005	614	725	827	51	309	205	2	
Keja-Chewaka	1973	2900		1282	9	485		107	
	1987	2588	488	1015	116	275	209	90	
	2001	1352	1394	780	98	236	86	78	758
	2005	814	1301	858	81	223	171	78	1272
Beto	1973	1288		395	44	288		343	
	1987	1215	132	402	66	180	39	323	
	2001	780	599	410	33	213	14	308	
	2005	550	792	410	36	212	79	312	

Note: DCF, Dense closed forest; CF-d, Closed forest (disturbed); OF, Open forest; ATM, Agric/tree mosaic; Ec, Exposed/ cultivated; W, Wetland; TP, Tea plantation

**Table 2.3 The periodical extent of landcover classes around the Gemadro Coffee Plantation Project area (not the whole Gemadro *Kebele* is shown here)**

<i>Kebele</i>	Year	Dense forest	closed forest (disturbed)	Open forest	Agric/tree mosaic	Agri.	Exposed/cultivated	Cloud block
Gemadro (not the whole <i>kebele</i> )	1973	4389	414	784	75			
	1987	2461	481	2430	267	22		
	2001	861	942	2368	368	1034	88	
	2005	914	956	691	1883	814	52	349

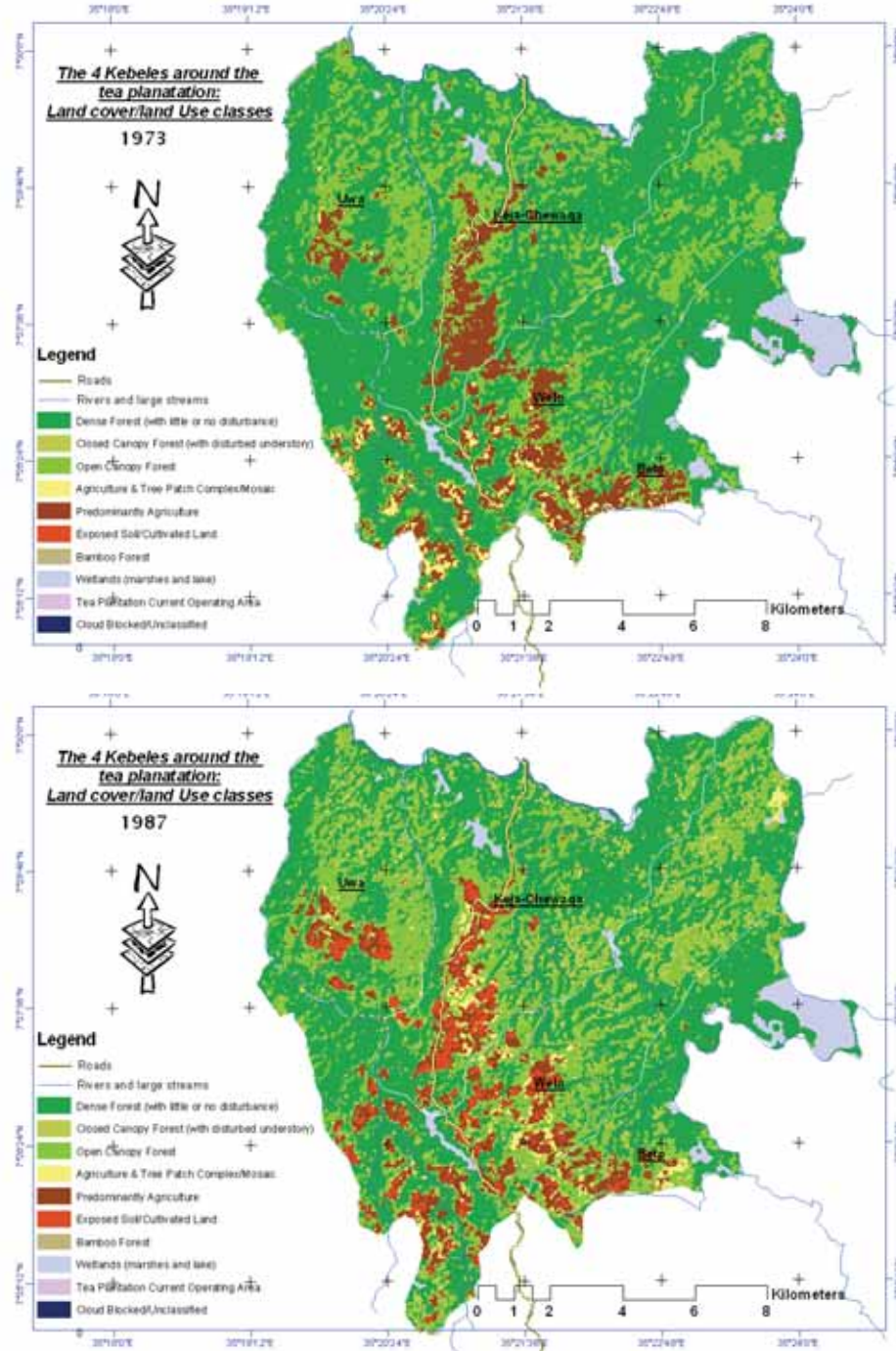


Figure 2.3a Spatial representation of landcover in 1973 and 1987 around Chewaka-Uto tea plantation



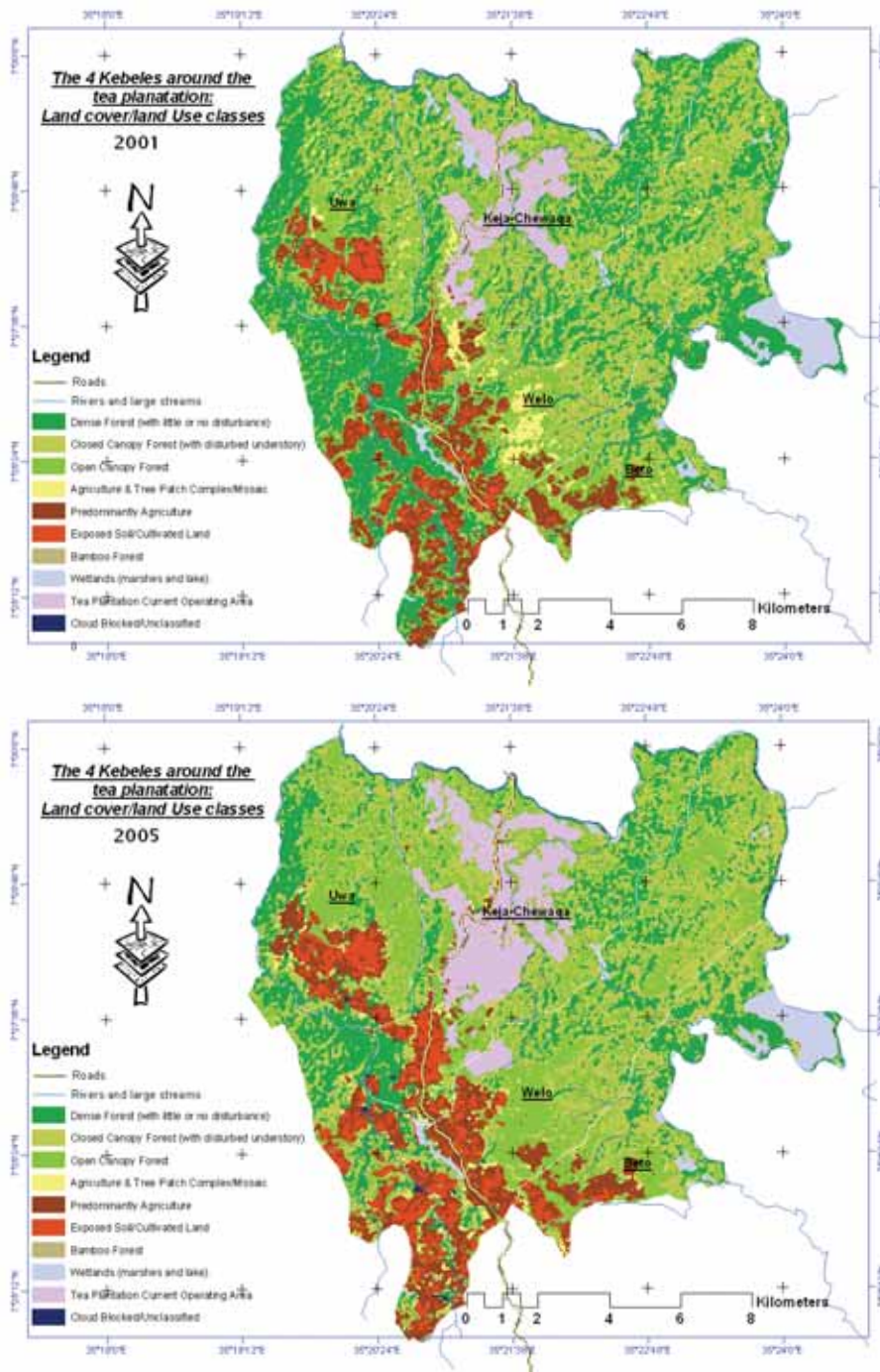


Figure 2.3b Spatial representation of landcover in 2001 and 2005 around Chewaka-Uto tea plantation

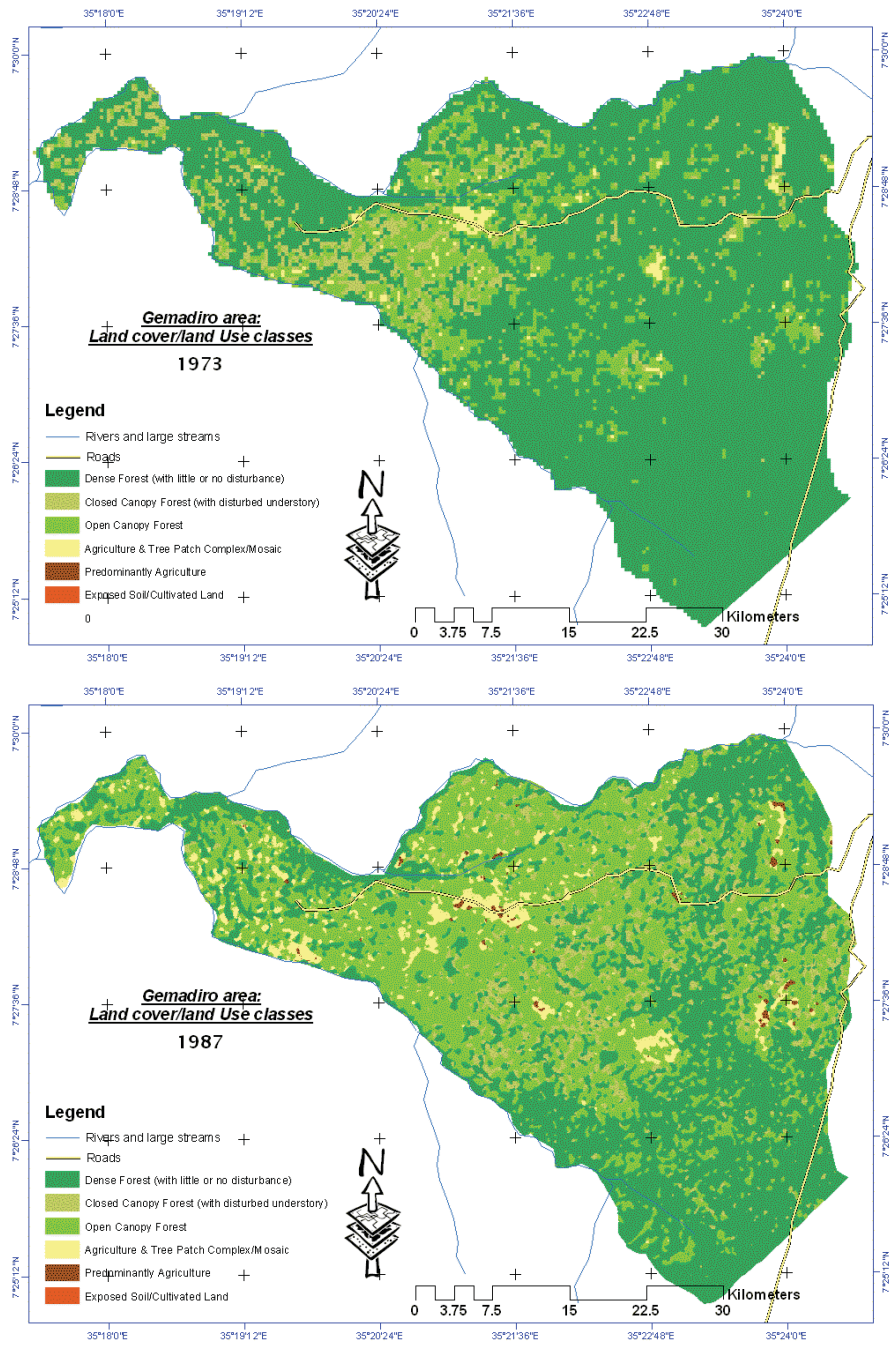


Figure 2.4a Spatial representation of periodical landcover classes around Gemadiro (1973 and 1987)

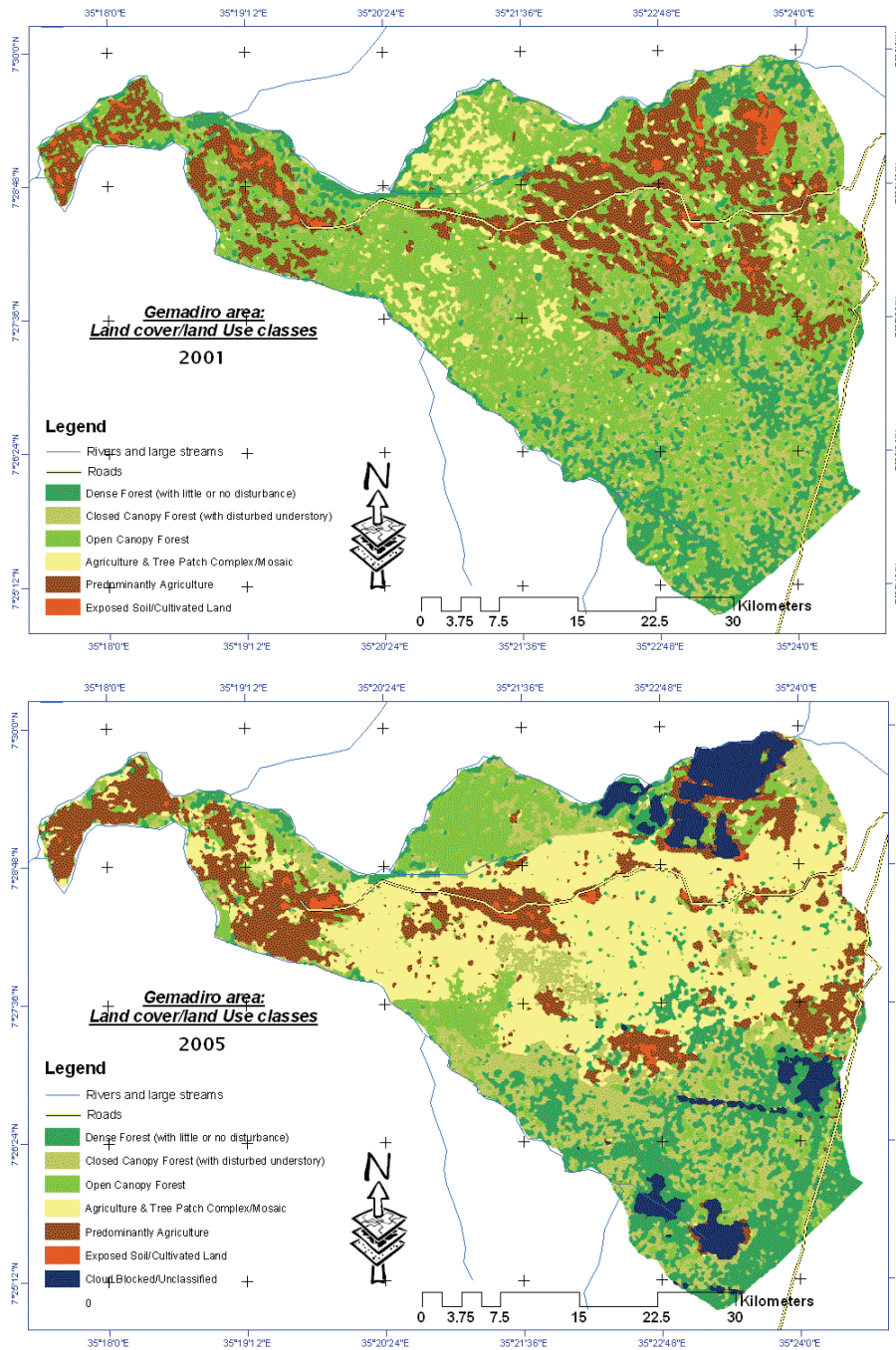


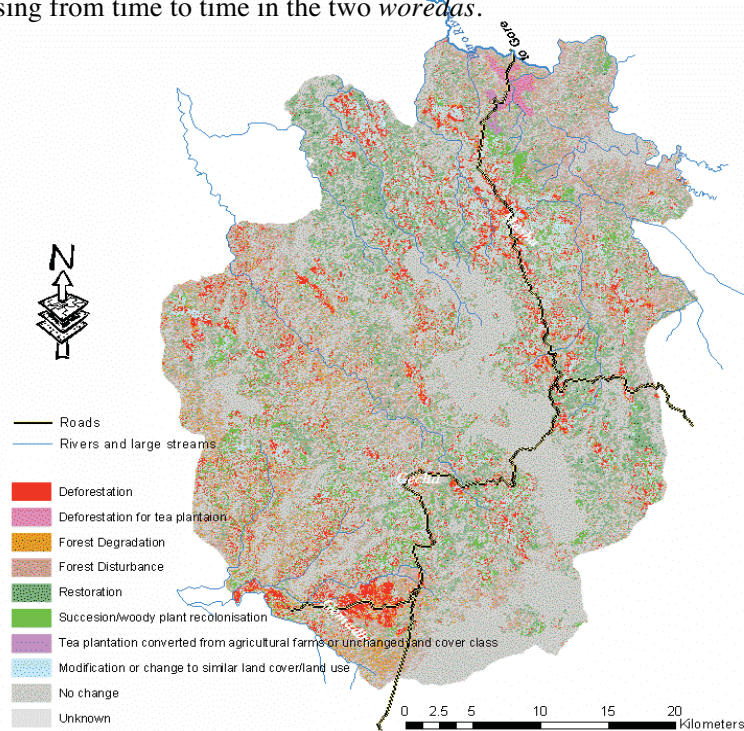
Figure 2.4b Spatial representation of periodical landcover classes around Gemadiro (2001 and 2005)

## 2.5.2 Landcover changes

Two types of landcover change patterns may be distinguished in this study area.

### 2.5.2.1 Landcover change caused by local farmers

Landcover change processes are largely influenced by increase in population. As in many rural places in developing countries, in the study area, an increase in agricultural areas is accompanied with proportional decrease in forest cover or quality. Between 1987 and 2001, up to 922 hectares of dense forest and 4811 hectares of open forest were converted to agricultural land. Within the same period the total sum of open forests that have regenerated on land previously detected as agriculture was remarkably high (Figure 2.5). About 3300 hectares of open forest had been converted to agriculture, as compared to 2382 hectares of secondary forest that had regenerated from previously agricultural land and tree patches complex. Generally, without direct external influence, the landcover change process is two way in most cases, deforestation and secondary regeneration of forest. However, the proportion of deforestation to secondary regeneration is increasing from time to time in the two *woredas*.



**Figure 2.5 Landcover change processes in Andracha and Masha Woredas from 1987 to 2001**



### 2.5.2.2 *Investment induced landcover change*

Investment in agriculture related business entails high level of land management and natural resources manipulation. Tea plantation entails a complete removal of other plants from the area, while coffee plantations tend to retain some trees for shade. The extent of impact and the influence on the trend of landcover change is shown for each intervention schemes.

#### *i. East African Holdings Tea Plantation*

Within the four *kebeles* where the East African Holdings Tea Plantation is actively operating deforestation has been increasing. Deforestation for tea planting purpose accounts for 38% and 34% of the total deforestation between 1987–2001 and 2001–2005, respectively (Table 2.5 and Figure 2.6). From inception to 2001, nearly 755 hectares of land were converted to tea plantation. About 73% (549.6 ha) of these lands were made ready through clear-cut deforestation. The contribution of dense forest with little disturbance, closed canopy forest with human disturbance and open canopy forest was calculated to be 303.7, 58.3 ha and 187.6 hectares, respectively (see change matrix for full details). Apart from conversion of forest classes into non-forest landcover/landuse, forest disturbance increased dramatically to nearly four fold. In areas far away from tea plantation and some pockets within the tea plantation project areas, natural regeneration of pioneer tree species was spotted.

**Table 2.5 Observed and calculated landcover change processes around the four *kebeles* in hectares**

Landuse/Landcover Process	1973–1987	1987–2001	2001–2005
Deforestation	753	891	1059
Deforestation for Tea Plantation	0	549	550
Forest Degradation	1521	505	325
Forest Disturbance	946	2648	3193
Forest succession/Woody plants regeneration	641	570	600
Modification to similar agriculture based landcover	509	527	713
No change	10660	9072	7988
Restoration	1441	1732	1280
Undefined	112	90	875

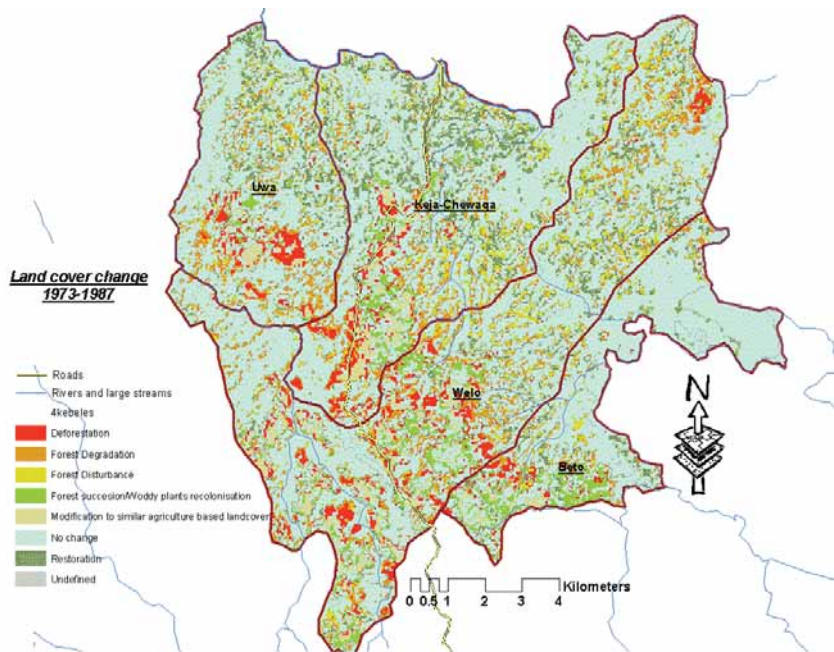


Figure 2.6a Location and magnitude of major landcover change processes between (1973 and 1987) in the four *kebeles*

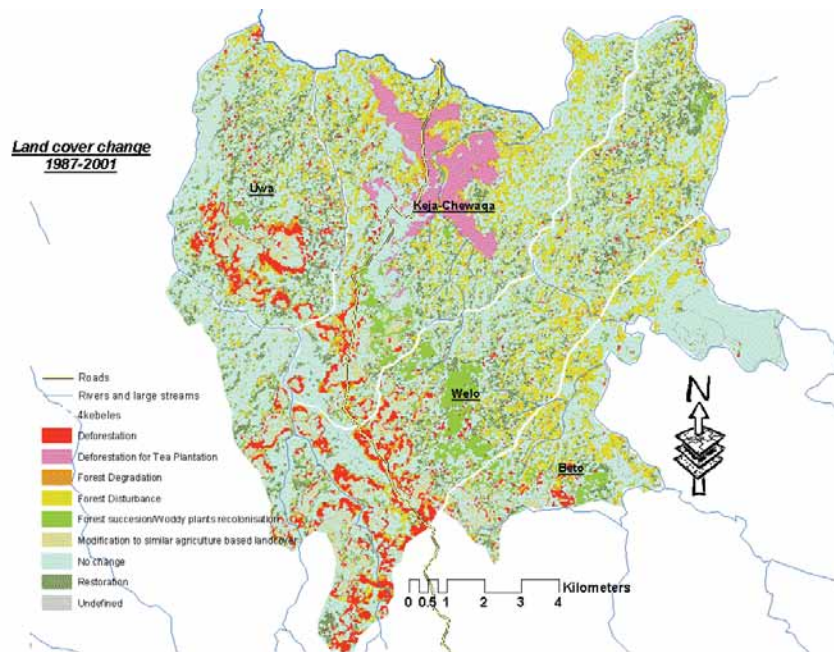
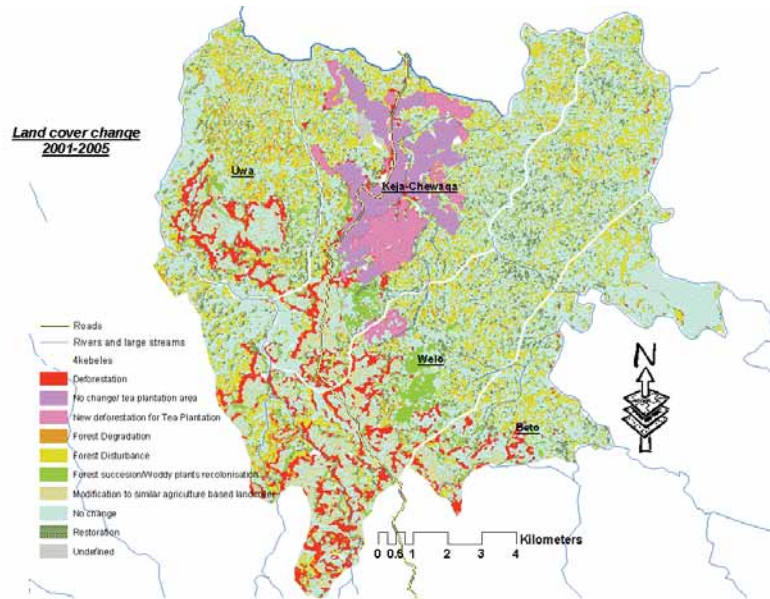


Figure 2.6b Location and magnitude of major landcover change processes between (1987 and 2001) in the four *kebeles*



**Figure 2.6c** Location and magnitude of major landcover change processes between (2001 and 2005) in the four *kebeles*

**Table 2.6** Landcover change around Chewaka-Uto process from 1987–2005

Landuse/landcover process around the 4 <i>kebeles</i>	1987–2005 (in hectares)
Deforestation	1602.20
Deforestation for Tea Plantation	1024.89
Forest Degradation	827.94
Forest Disturbance	3757.74
Forest succession/ Woody plants regeneration	613.33
Modification to similar agriculture based landcover	625.29
No change	6547.91
Restoration	1416.08
Undefined	167.71

The total size of land that have undergone different landcover change processes since the inception of the tea plantation farms around the four *kebeles* are summarized in Table 2.6 and Figure 2.7.



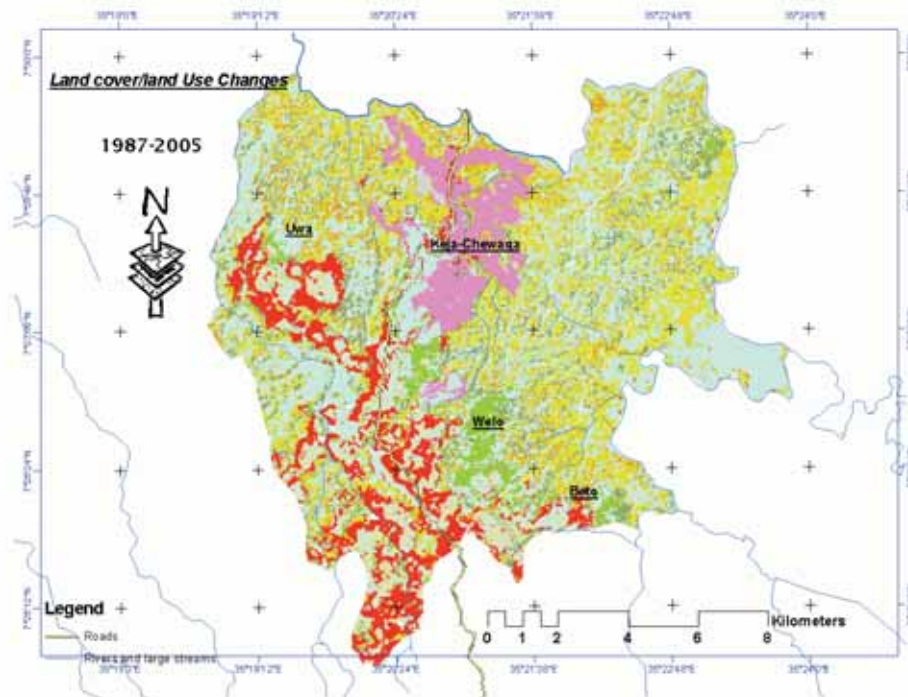


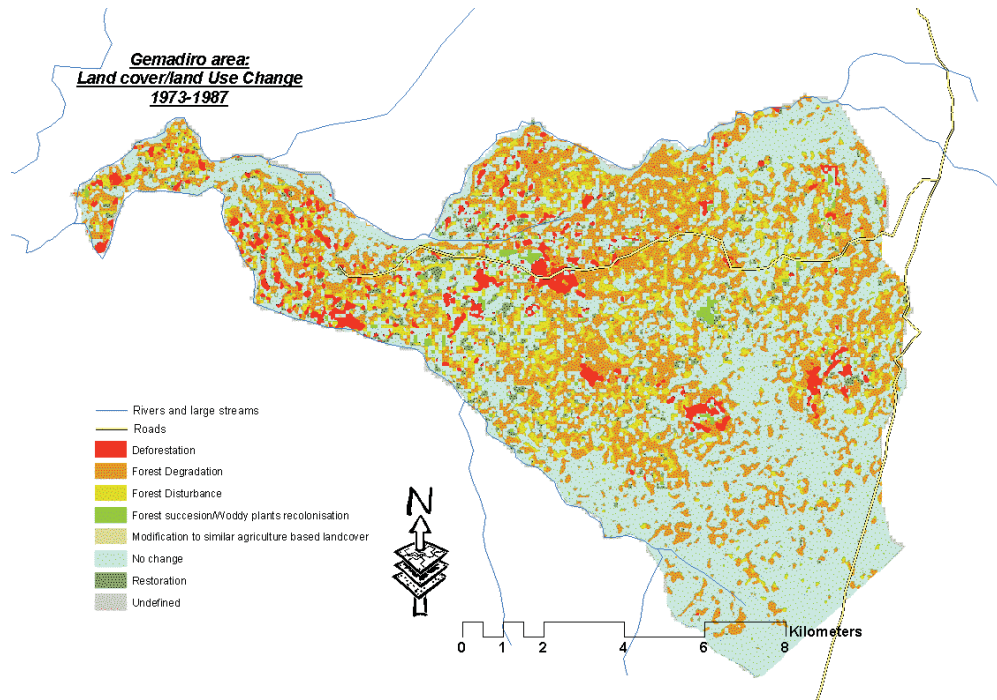
Figure 2.7 Location and magnitude of landcover change processes since 1987

#### ii. Gemadro Coffee Plantation Project

The Gemadro Coffee Plantation Project operates entirely within the Gemadro *Kebele*. Severe deforestation and forest degradation has happened there in the recent past. Between 2001 and 2005 alone, a quarter of the total area experienced at least one form of forest degradation or deforestation (Tables 2.7–2.8, Figures 2.8abc and 2.9). The total area of land affected since 1987 is about 50%. While the Gemadro Coffee Plantation area often had an outward visual appearance of a forest for remote sensors, ground assessment results show that this is not the case. Areas outside the plantation are no more exceptions to this trend. Adjoining forestlands between 1000 and 2000 meter above sea level are modified for coffee plantation. It appears that there is a huge influx of small-scale coffee farmers from other areas.

**Table 2.7** Observed and calculated landcover change processes around Gemadro in hectares

<i>Landuse/Landcover Process: Gemadro</i>	<b>1973–1987 (in hectares)</b>	<b>1987–2001 (in hectares)</b>	<b>2001–2005 (in hectares)</b>
Deforestation	260.0	1296.3	1634.2
Forest Degradation	1552.1	752.0	51.1
Forest Disturbance	693.0	882.1	298.7
Forest succession/Woody plants regeneration	45.8	100.0	777.9
Modification to similar agriculture based landcover	4.9	127.0	98.3
No change	2933.3	2259.8	1498.2
Restoration	163.9	237.1	950.9
Undefined	26.8	25.4	370.4



**Figure 2.8a** Location and magnitude of major landcover change processes in Gemadro area between 1973–1987

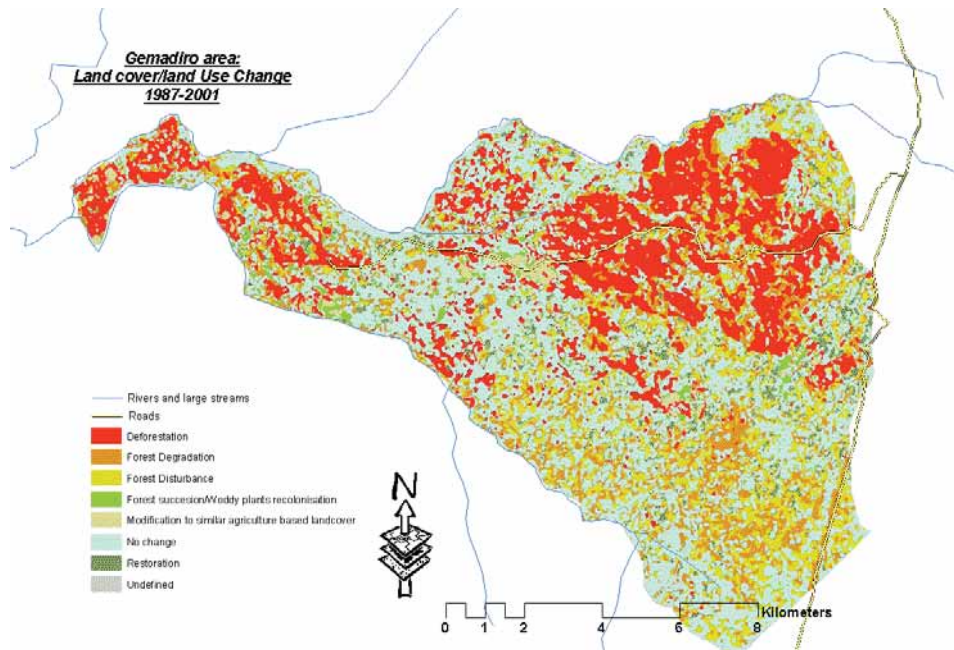


Figure 2.8b Location and magnitude of major landcover change processes in Gemadiro area between 1987–2001

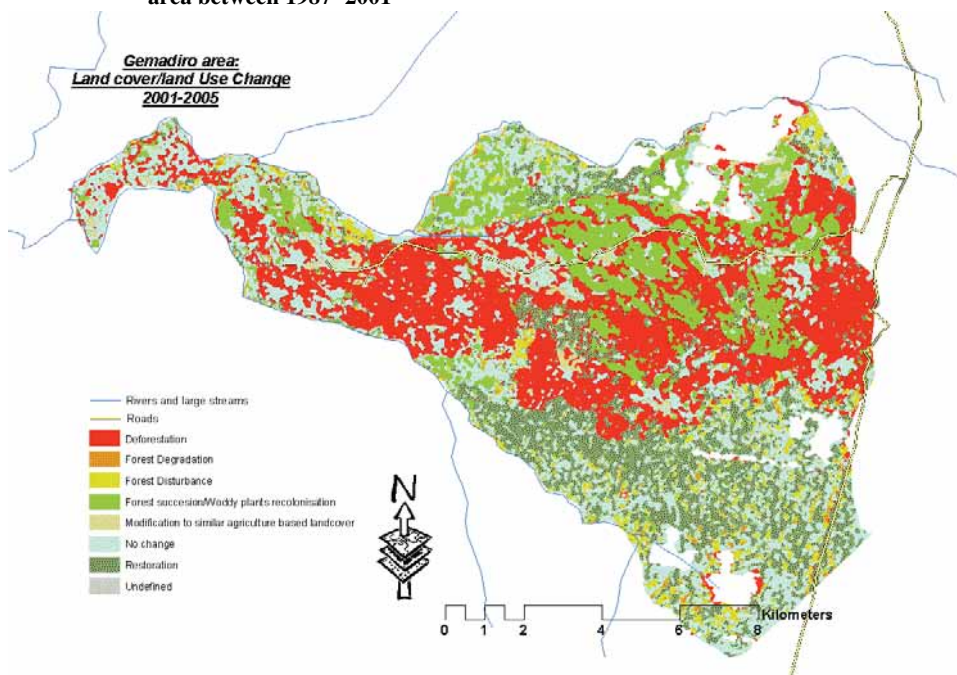
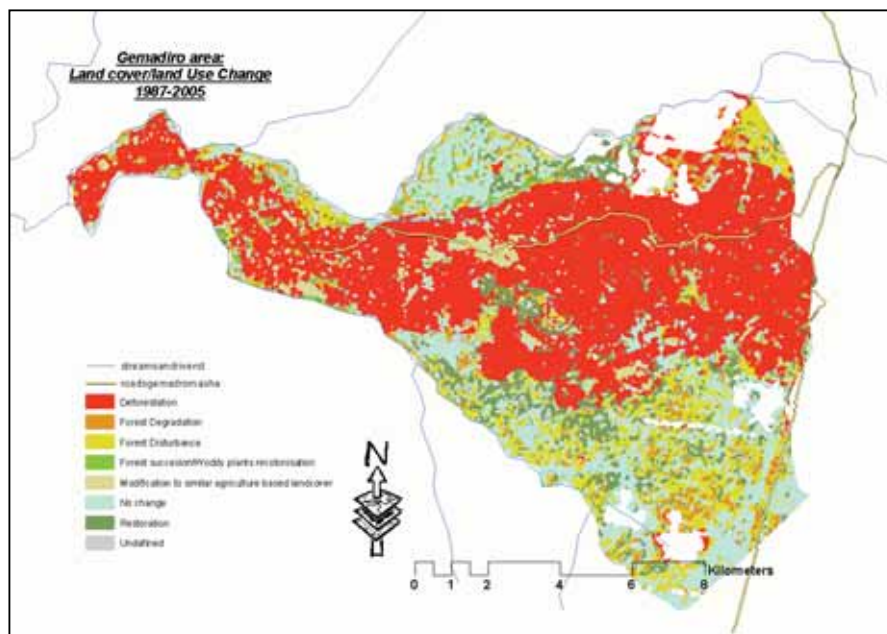


Figure 2.8c Location and magnitude of major landcover change processes in Gemadiro area between 2001–2005

**Table 2.8 Landuse/Landcover Process around Gemadro area, 1987–2005**

Process	Area (Hectares)
Deforestation	2523.2
Forest Degradation	220.9
Forest Disturbance	620.0
Forest succession/Woody plants regeneration	64.8
Modification to similar agriculture based landcover	141.2
No change	1247.5
Restoration	487.6
Undefined	374.5

**Figure 2.9 Location and magnitude of landcover change processes since 1987 around Gemadro****2.5.2.3 Natural restoration potential of the Sheka Zone forestland**

Climatic conditions are in favour of quick rehabilitation in this area. Even in relatively deforested parts of the Sheka Zone, trees that can serve as seed source were seen scattered through out the landscape with in short distance between them. When a piece of land is fallowed in this locality for a season or two, chances are high that natural regeneration takes place. For instance

the area 6 km northeast of Masha town in Welo *Kebele* was largely deforested for villagization and resettlement in the 1980s (personal communication, with Masha *Woreda* Agricultural Bureau officers). After abandonment of the settlement site, it had exhibited recovery and eventual restoration between 1987 and 2001, before some part of it started degrading again latter. Between 1987 and 2001, for every 11505 hectares of degraded forest there was from 2365 to more than 6000 hectares of restocking or restoration in the entire two *woredas*. This recovery did not necessarily require the complete exclusion of human activity from the area. Economic activities such as honey production and other non-timber product extraction were always taking place. A near cyclic pattern is observed between the open forest class and the landcover class that represents tree aggregations and agriculture mosaics. Between 1987 and 2001, a total of some 55 hectares of land classified as 'tree and agriculture patches complex' had been fully restored to dense forest, 120 hectares to closed forest and 2382 hectares to open forest. During the same period, 278, 76 and 3281 hectares of dense, closed and open forest, respectively were converted to the agriculture and tree mix class. Results of the cover change studies of the different periods revealed that deforested areas for traditional agriculture can easily regenerate as secondary forest in short time, and even recover to former state if given longer time for succession.

### 2.5.3 Issues of map delineation on paper and on ground

The study team found two boundary maps of the tea plantation project prepared by 'the former Kafficho-Shekicho Zone and the current Sheka Zone (Figure 2.10).

**Table 2.9 Size of land claimed by Chewaka-Uto Tea Plantation Project in the four *kebeles***

	Size of <i>Kebele</i> (ha)	Included area in map 1 <sup>1</sup>	Included area in map 2 <sup>2</sup>
Beto	2358	11	282
Keja-Chewaqa	4789	23845	2218
Uwa	2730	0	55
Welo	6653	651	954
<b>Total area</b>		<b>3047</b>	<b>3509</b>

<sup>1</sup> Map 1 is the boundary map agreed by Kaficho-Shakicho Zone administration and the East African Holdings.

<sup>2</sup> Map 2 is prepared and approved by Regional Investment Bureau and final approval was given by the administration of the current Sheka zone.

Without endorsing the legality of those maps, an effort was made to find out to which of those sketch maps the tea plantation administration was sticking to. Surprisingly, however, the tea plantation had not been restricted to the spatial limit imposed on them. It is as though they could take any land around there that is suitable to their goal. According to the Finance Office of the Masha *Woreda*, so far, the management of the tea plantation admits to using only 870 hectares of land by 2005 and was willing to pay land rent only for this area. Without commenting on the content of land rent agreement, at least 1025 hectares of forestland has already been cleared since the plantation started managing the area.

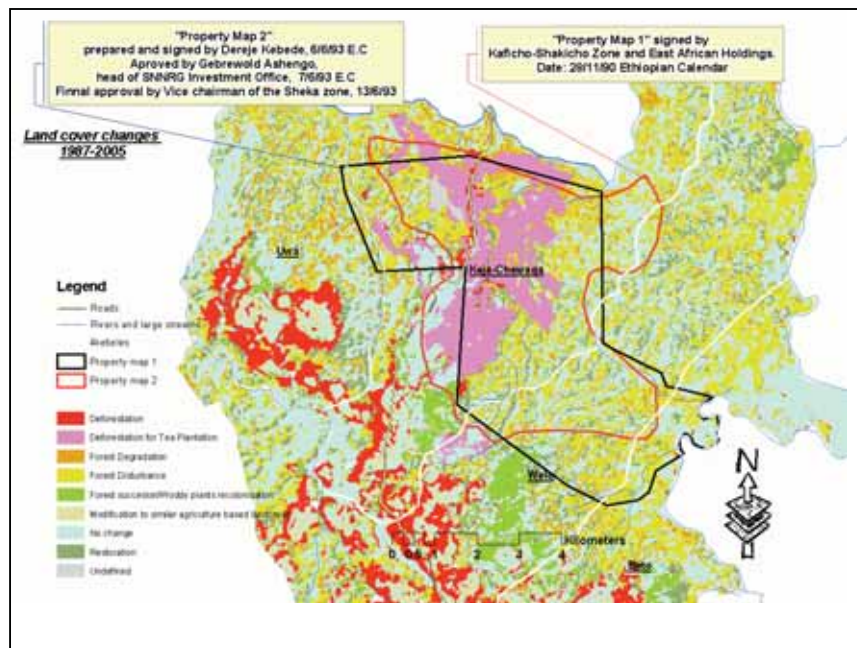
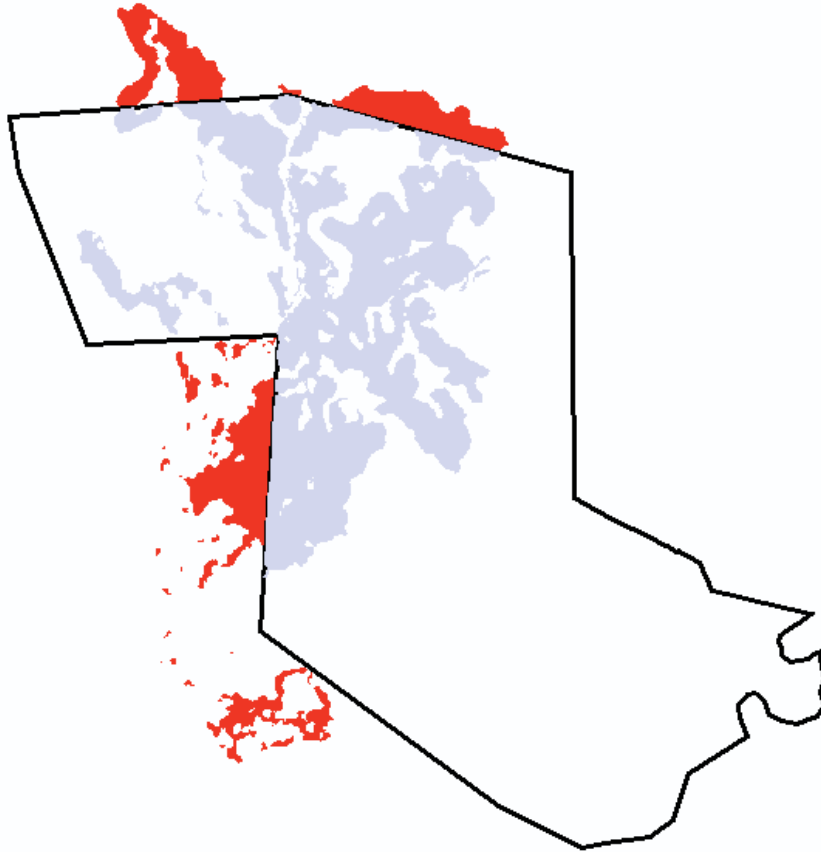


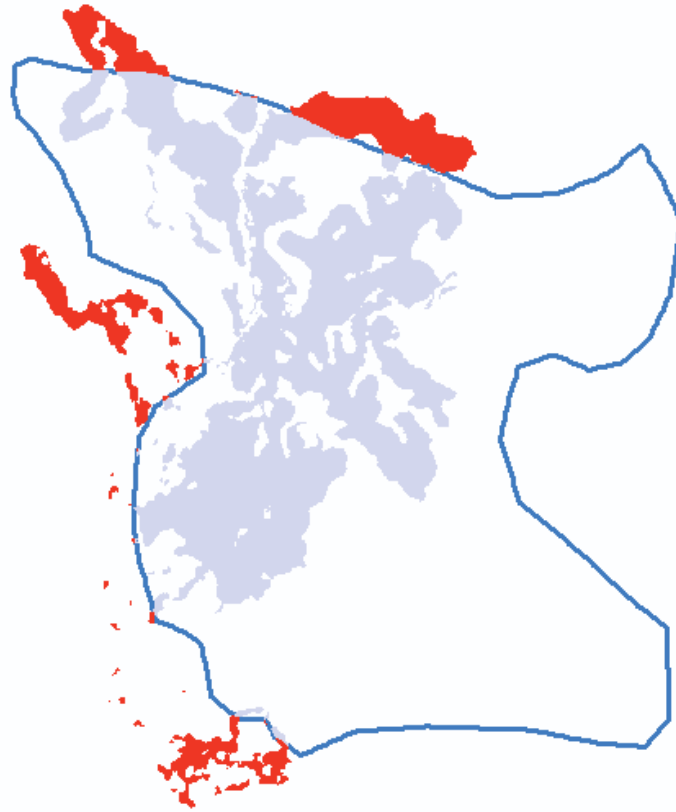
Figure 2.10 Landcover change processes within the known two boundary maps

Of the total 1025 hectares deforested for the tea plantation up to March 2005, an area about 756 hectare was within the area property map recognized by the investment bureau of SNNP Regional State and the administration of the Sheka Zone (Figure 2.11). The remaining 266 hectares was outside the boundary map prepared by the investment bureau of the region and approved by the highest local authority of the Zone.



**Figure 2.11 Deforestation outside boundary map known by the Investment Bureau of the Regional Government and the Zonal Administration**

Similarly, the tea plantation had cleared forest areas, and converted more forestland to tea plantation than agreed upon with the then Kaficho-Shakicho Zone (Figure 2.12). About 197 hectares of the land under tea plantation today falls outside of the project boundary the two parties agreed upon. The study team did not find any other property map which includes the areas cleared for plantation outside of the two maps mentioned above. Besides, none of these two maps are available at the Tea Plantation Project Office in Chewaka. It appears that project workers clear any part of the forest which happens to be easy to work in, without paying any attention to boundaries.



**Figure 2.12** Deforestation outside the map agreed by former administration and tea plantation project

#### 2.5.4 Vulnerability to erosion

Vegetation loss in general and deforestation in particular is associated with erosion in areas of high rainfall. The Sheka Zone is one of the few areas in Ethiopia where there is rainfall all year round. Consequently, without sufficient vegetation cover, the soil is vulnerable to erosion all year round. The hazard of erosion, however, depends on other factors such as slope and soil cohesion properties (Assefa Kuru 1986). Due to absence of reliable data to the latter factor, a slope and vegetation dependant erosion hazard map was prepared for the two *woredas* (Figures 2.13 and 2.14). More than two third of the landscape in the study area was found to be under insignificant erosion risk due to the prevalence of vegetation cover as derived from the 2001 satellite image. Only 15% of the total area was under high or very high risk (Table 2.10).



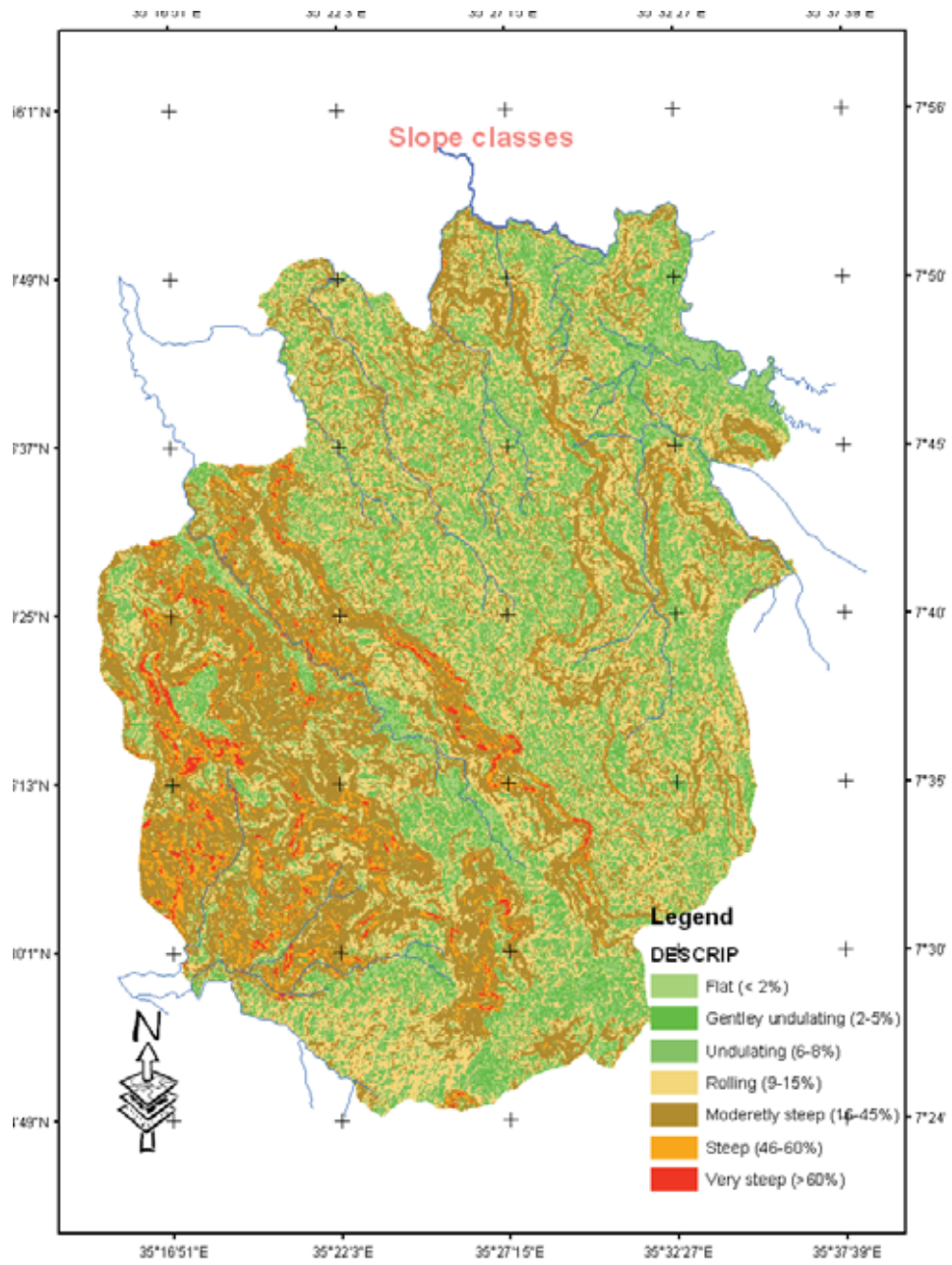
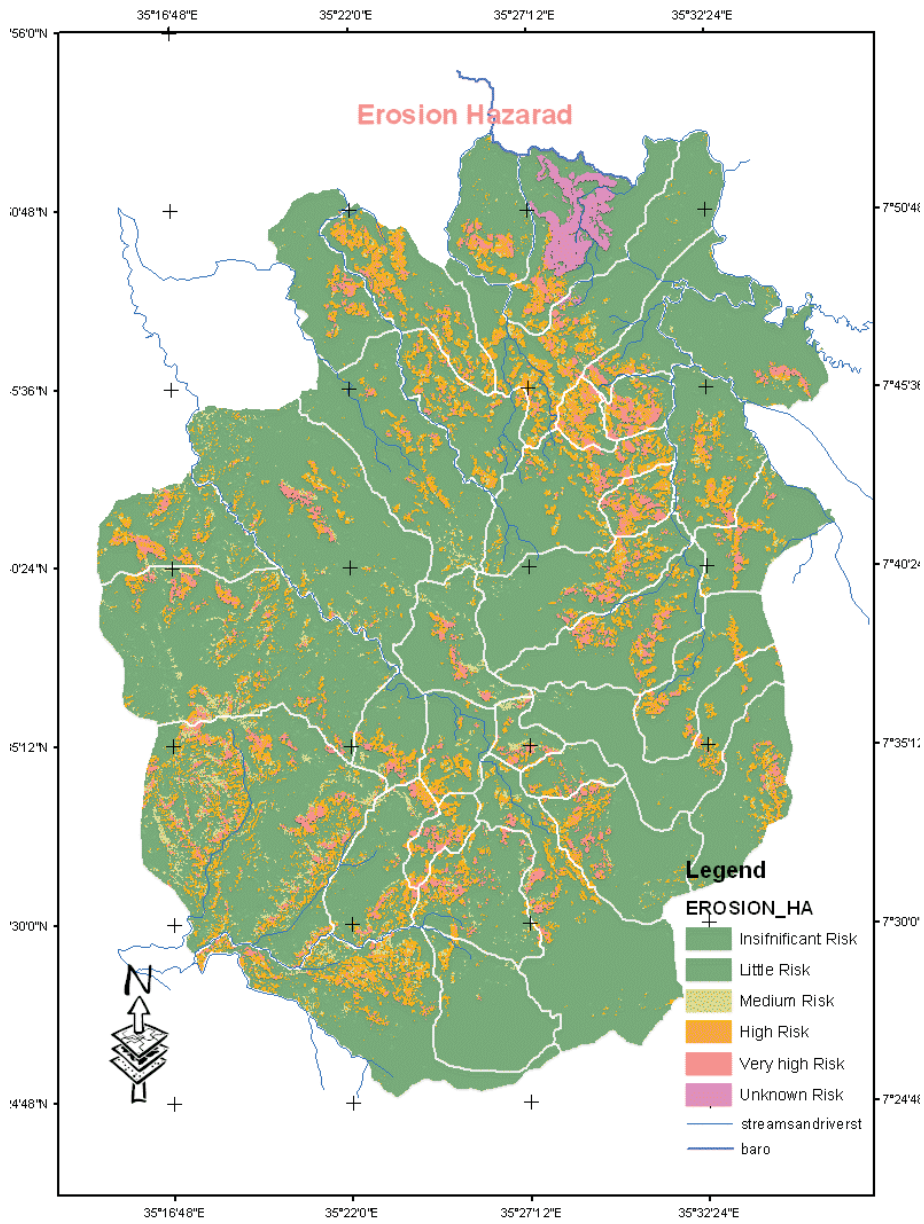


Figure 2.13 Slope classes of Masha and Anderacha Woredas based on 2001 satellite image



**Figure 2.14** The location of erosion risk classes of Masha and Anderacha Woredas based on 2001 satellite image

**Table 2.10 Slope classes in 2001**

Slope Class	Area (ha)	% total area
<2%	9577.65	6.74
2–5%	17291.15	12.17
6–8%	22303.50	15.70
9–15%	40119.84	28.24
16–30%	32089.37	22.58
31–45%	13040.24	9.18
46–60%	5909.27	4.16
>60%	1753.95	1.23

**Table 2.11 Erosion hazard classes in 2001**

Erosion Hazard classes	Area (ha)	% total area
Insignificant Risk	92277.26	64.95
Little Risk	22557.19	15.88
Medium Risk	4600.67	3.24
High Risk	15673.28	11.03
Very High Risk	5188.82	3.65
Unknown Risk	1787.75	1.26

A successfully growing tea plantation is known to reduce erosion significantly (Othieno 1975). However, establishment of the plantation entails a huge soil work that facilitates severe soil erosion (Thomas and Bekele 2004). Moreover, there is a periodical complete clear cutting as some part of the tea plant block gets old or produces low quantity and quality. The study team witnessed a vast block of land devoid of any vegetation after such tea plantation management. However, since it was not possible to determine the duration of time the land was exposed bare, it was not possible to determine the severity of erosion induced by activities of tea plantation establishment.

## 2.6 Discussion

Under normal local land management practice, large-scale clearing is not practiced. Such practice was also observed in none of the satellite images analyzed. Landcover changes prior to tea plantation were minor and cyclical associated with shifting cultivation. Even though the difference between the rate of deforestation/forest degradation and restoration/succession is increasing, the Sheka Zone forest ecosystem may not be described to be in state of destabilization largely due to the management of the local communities. The community has tree/forest tenure system called ‘Kobo’,

where they manage their forest for honey production (Hartman 2004). Hence, maintenance of forest cover has contributed to low erosion hazard. Forest areas on steep slopes, called '*Gep Dinbaro*', are traditionally protected. These forests, however, are also used for production of non-timber forest products especially honey and climbers for house construction. This has contributed to watershed protection of areas, which are otherwise highly vulnerable to erosion and risk of flooding in lowland areas.

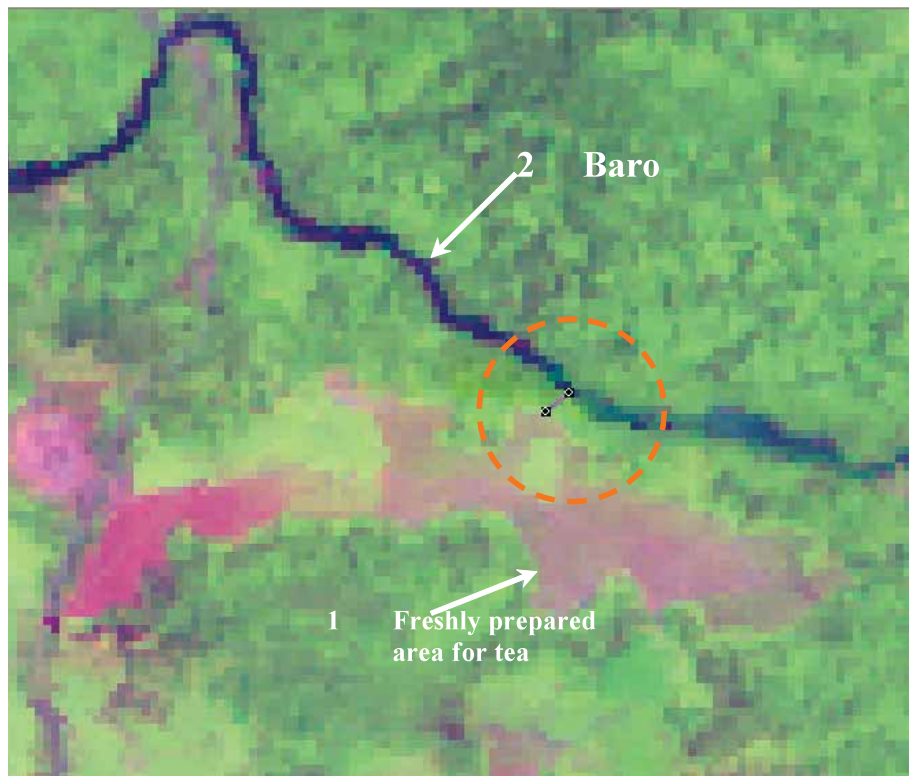
The Ethiopian Central Statistics Agency (2003) estimated that about 38,115 and 25,726 traditional beehives are found in Masha and Andracha *Woredas*, respectively, with annual production of over 520 thousand kilograms of honey. There are about 60 beehives per km<sup>2</sup> of open forest and 101 and 90 beehives per km<sup>2</sup> of dense and closed forests in Andracha and Masha *Woredas*, respectively. At an average productivity of 8.4 kg per beehive per year, the importance of honey production alone for the livelihood of the local community is quite high. From this one product alone, one can realize the severity of the impact of deforestation for investments on the livelihoods of the local people, other than the known effects on the environment and biodiversity.

Investment in plantations, especially tea plantations, has created conflict with the interests of the local community. An investment initiative that does not respect any form of available rule, be it national, regional or local, is not expected to bring meaningful benefit to the surrounding people. The argument that the original 500 ha forest area given for tea plantation was at one time a settlement area is not valid as it ignores the natural forest succession processes, as abandoned farmlands and settlement areas could easily recover, as can be seen in cover change dynamics of the area over the past 30 years alone (personal communication, with Zone and *woreda* officials). Even under the management of the tea plantation now, some cleared pocket areas that were found not to be suitable for tea plantation, showed a remarkable recovery to full dense forests.

The net annual forest loss around the four target *kebeles* increased dramatically only after the mid 1990s. From 1973 to 1987 the annual forest loss from the available forest resource base of the *kebeles* was only 0.2%, 0.27%, 0% and 0.15% in Welo, Uwa, Beto and Keja-Chewaka, respectively. Since 2001 rate of net forest loss has increased to 1.6% in Welo, 1.3% in Uwa, 0.5% in Beto and 4.3% in Chewata-Uto where the impact is major. Thus previous history of land in the area can not be used as a basis for granting it to investment.

The presence of 500 hectares of previously degraded forestland should not have been used to grant a license without ground limit. The regional, zonal and *woreda* officials and politicians are aware that the company was granted

3435 hectares of forestland. However, the exact boundary was not clearly marked on the ground since there are two totally different type of maps on paper that were agreed upon with the local authorities at different times. None of these maps were actually strictly adhered to by the company while expanding areas of tea plantation. The company has also violated its agreement to leave a buffer zone of riverine forest along the Baro River. The need to protect the riverine vegetation from any form of human induced activities has been indicated in the contract document signed by the zonal Administration and the Chewak Uto Forest Plantation Project of the EAA Company. Even though it was clearly stated that the tea plantation activities should be at least 1200 meters far away from the Baro River, forest clearance for the tea plantation had gone deeper, as close as 91 meters from Baro River bank, as was detected from the March 4 2005 Landsat 7 satellite image (Figure 2.15).



**Figure 2.15** Location of one of the Baro River banks that is affected by tea plantation activities

Unlike the vast indiscriminate clearing of pristine forests by the Chewaka-Uto Tea Plantation Project, spontaneous and widely scattered pockets of deforestations and forest degradation were observed in Gemadro. There is a growing enthusiasm by small traders and merchants to grab as much land as they could get in Gemadro *Kebele* and its surrounding. This has been stimulated by the rise of coffee price in the world market in very recent years, after the devastating fall of 1999/2000. The impact on the forest and the environment as a whole has been both due to coffee plantations and expansion of similar practice by members of the local community. The local people have an ambivalent position on the practice as they get income in short terms from coffee, but are also deeply concerned about the long term sustainability of converting forest to coffee farms. In contrast to Chewaka-Uto Tea Plantation, there is no conflict of interest between the local community and the Gemadro Coffee Plantation, and the local administration. However, it is important to note the impacts of such changes on the environments, since deforestation rate in the area has reached about 12.2% per year, since 2001.

## 2.7 Recommendations

For sustainable use of the forest resources and proper landuse in the Zone, the following actions are recommended:

### 1. Capacity building of local officers

- a) **Mapping:** GPS based simple mapping techniques for Zonal and *woreda* officers. There is a possibility to use normal desktop computer facilities in Masha town. These facilities can be upgraded for use in GPS based mapping. Accordingly training opportunities should be provided for 4 to 6 people from Sheka Zone Investment Bureau, Landuse Bureau and the Masha and Andracha *Woredas* Bureau of Agriculture. At the moment the bureaus that are working on delination of lands for investment rely on maps produced by the investors themselves.
- b) **Institutional coordination:** Conservation requires the cooperation of multidisciplinary institutes. To this end, a capacity building training in this aspect should be arranged at both *woreda* and Zone levels.
- c) **Environmental protection:** A hierarchical environmental education as capacity building for *woreda* and zone professionals and politicians

should be designed. The ‘investment promotion’ bandwagon should not be at very high environmental cost to the region and the country.

- d) Promotion of non-timber forest products:** This activity is already started by some concerned NGOs. Lessons should be learnt and its wider application should be sought. It should be noted that more than Birr 4.5 million is annually contributed to the national economy from honey production in Masha and Andracha *Woredas* alone.
2. **Urgent delineation of ecologically and socially critical forest areas:** Such forest should be clearly delineated and buffered from any type of investment initiatives that require clearing forests.
3. **Urgently take legal and administrative action on investors that transcend agreed boundaries and activities.** The current destruction of pristine forest by plantations should be stopped. As it is the situation is grave and frustrating for the local people. Concerned governmental bodies should urgently look at the problem critically and take prompt correction measures.

## 2.8 References

- Assefa Kuru (1986). Soil Erosion and Strategic State Policy: The Case of Ethiopia. PhD Dissertation. Faculty of Agriculture and Forestry of the University of Helsinki.
- Breitenbah, F.V. (1962). Natural forestry planning: A feasibility and priority study on the example of Ethiopia. *Ethiopian Forestry Review* 3/4:41–68.
- Burdge, J.R. (1998). A conceptual Approach to Social Impact Assessment: Revised Edition, Social Ecology Press, Middleton.
- Central Statistics Authority (2003). Ethiopian Agricultural Sample Enumeration - Results for S.N.N.P Region. Statistical Reports. Central Statistical Authority, Addis Ababa, Ethiopia.
- Chaffey, D.R. (1980). South-west Ethiopia Forest Inventory Project. Ministry of Overseas Development, Land Resources Division, Tolworth Tower: Surbiton, Surrey, England.
- Congalton, R. (1988). A comparison of sampling schemes used in generating error matrices for assessing the accuracy of maps generated from remotely sensed data. *Photogrammetric Engineering & Remote Sensing* 54:593–600.
- EFAP (1994). The challenge for development. Volume II. Ethiopian Forestry Action Program (EFAP) Secretariat, Addis Ababa, Ethiopia.

- EHRS (1985). Ethiopian Highlands Reclamation Study (EHRS), Part III, Development Strategy. Addis Ababa, Ethiopia.
- FAO (1993). Forest Resources Assessment 1990, Tropical Countries. Forestry Paper 112, Rome, Italy
- FAO (2001). Forest Resources Assessment 2000. Internet Edition: <http://www.fao.org/forestry/fo/country>.
- FDRE (1997). The Conservation Strategy of Ethiopia. Volume I, The Resources Base, its Utilization and Planning for Sustainability. Federal Democratic Republic of Ethiopia (FDRE). Addis Ababa, Ethiopia.
- Geist, H. (2000). Setting the stage for examining key drivers of landuse/cover change processes. LUCS Newsletter Number 5 p. 9. Louvain-la Neuve.
- Hartmann, I. (2004). “No Tree, No Bee – No Honey, No Money”: The Management of Resources and Marginalisation in Beekeeping Societies of South West Ethiopia. Conference: Bridging Scales and Epistemologies, Alexandria, March 17 – 20, 2004.
- Hoffer, R.M. (1986). Digital analysis technique for forestry applications, in the use of LANDSAT data in forestry. Hardwood Academic Publishers, pp. 61–110.
- Lillesand, T., Ralph, M. and Kiefer, W. (2004). Remote Sensing and Image Interpretation. Fourth edition. John Wiley & Sons, Inc. New York.
- MoA (1990). Forest Resources Base Identification, Conservation and Rational Use in Ethiopia. May 1990, Ministry of Agriculture (MoA). Addis Ababa, Ethiopia.
- MWR (1995). Upper Baro Akobo River Basin Study. Survey and Analysis of the Baro Akobo Basin, Volume IIIe. Ministry of Water Resources (MWR). Forestry. Addis Ababa Ethiopia.
- Othieno, C. (1975). Surface run-off and soil erosion on fields of young tea. Tropical Agriculture, Vol 2, pp 299–308.
- Schowengerdt, R. (1997). Remote sensing models and methods for image processing. Second edition. Academic Press. San Diego, CA, USA.
- SNNPRS (1999). Southern Nations Nationalities and Peoples State Forestry Action Program, Main Document. Awassa, Ethiopia.
- Thieno, C. (1975). Surface run-off and soil erosion on fields of young tea. *Trop. Agric.* **52**:299–308.
- Thomas, I. and Million Bekele (2004). In FAO (2004). The Role of Planted Forests and Trees Outside Forests in Landscape Restoration in Low Forest Cover Countries, Planted Forests and Trees Working Paper 34E, Forest Resources Development Service, Forest Resources Division. FAO, Rome (Digital publication).



### **3 The impact of landuse/landcover changes on biodiversity in Masha and Anderacha Woredas of Sheka Zone, SNNP Regional State**

**Tadesse Woldemariam**

#### **3.1 Summary**

This report is a case study on the diversity of the flora of forests in the Masha and Anderach *Woredas* of Sheka Zone, on the uses of plants by people, and the impacts of forest cover changes on diversity. The information given in this report was generated from field survey in August and September 2005, and from previous study reports and literature.

To generate first hand data, a Rapid Biodiversity Assessment (RBA) was carried out in major forest vegetation types in the study areas. Quantitative data were collected in sample plots. Transect walk with key informants was used to get list of plants in the region and record use of plants by people.

The study revealed that the forests in Masha and Anderacha *Woredas* are very rich in plant species composition. Around 190 and 180 species were recorded from forests in Masha *Woreda* and Gemadro area in Aderacha *Woreda*, respectively. Similarly, a total of 80 and 72 plant species were recorded in five study plots of the forests around Masha and Anderacha, respectively. Threatened plant species such as *Prunus africana*, and rare and endemic species such as *Canarina abyssinica* also occur in the area. The forest in the region has both global and national importance for conservation, and has recently been included in the Eastern Afromontane Biodiversity Hotspot.

There is high dependency of the local community on the forest. Almost all plant species recorded in the area have one or more types of local uses. The major non-timber forest products (NTFPs) recorded in the area are food, fodder, local construction materials, medicine, spices, honey, farm implements, household furniture and fuelwood. Most of the NTFPs are only used locally, and few are for both local use and income generation. The NTFPs that are used locally and also sold for income generation are honey, spices, and bamboo. The sources of the spices are Korerima (*Aframomum corrorima*) and Timiz/long pepper (*Piper capense*). Bamboo is used locally for several construction purposes and has a great potential to be developed and used for income generation.

However, forest biodiversity are being lost due to deforestation for agriculture and investment in tea and coffee monoculture plantations. Agricultural expansion has reduced forest biodiversity to few trees on farm and cultural forests on steep slopes. On the other hand, the impact of conversion to plantation is the worst consequence. The tea plantation has reduced diversity to single species, the tea plant or eucalypts planted for fuel. The impact of coffee plantation is not less. Compared to other coffee production systems in the southwest, Gemadro can be described as destructive as cereal crop based agriculture. In traditionally managed forest coffee in the region, about 300 trees/ha of diverse species are left as shade trees. In Gemadro, however, not more than 20 shade trees/ha, representing very few species of native trees are left as shade trees for coffee. Most of the native trees were cleared and replaced by exotic species such as *Sesbania sesban* for temporary shade during establishment.

### 3.2 Introduction

Forests are the most diverse ecosystems and are often considered as the reservoirs of biodiversity. Forests also provide humanity with many different goods and services that are required to sustain livelihood. The use of forests and forest products dates back several centuries in human history. Thousands of years back, people started managing forests to increase natural stands of edible plants like taro, bananas and Yam (Wiersum 1997). Depending on the type and level of exploitation, human use of forest resources has affected the conditions of forests. Habitat loss due to deforestation is one of the major causes of loss of biodiversity. Hence, conservation of biological diversity is seen as one of the greatest challenges that mankind faces today. Loss of biodiversity is increasing at an alarming rate, causing the biggest crisis since the last 65 million years (Ehrlich and Ehrlich 1981). This is mainly due to habitat loss caused by human induced perturbations in the course of utilization.

Ethiopia has lost most of its forest cover due to conversion to other landuse types over the centuries. Most of the remaining forest cover of the country is found in the southwestern part, especially in Wellega, Illubabor, Jimma, Keffa, Sheka and Bench-Maji zones. The forests in these areas have been also under heavy pressure during the last few decades due to conversion to plantation, settlements and agricultural land.

The Sheka Zone of the Southern Nations, Nationalities and Peoples Regional state is one of the zones where deforestation is going on at an alarming rate. This study was carried out to assess the impact of landuse/land cover changes on floristic diversity. The study focused on two *woredas* in Sheka

zone of the SNNP State, namely Masha and Anderacha. The two *woredas* were selected since they were exposed to all causes of forest cover change, ranging from conversion to agriculture by small holder farmers to large scale coffee and tea plantations of their first kind in the country. The process of forestland allocation for investment in plantations still continues without any environmental impact assessment, and the impact on the livelihood of the people.

### 3.3 The scope of this study

The aim of the study was to assess the consequences of changes in forest cover due to expansion for agricultural lands, investments, resettlements and other causes on floristic diversity in Masha and Anderacha *Woredas* of the Sheka Zone, SNNP Regional State. In particular, the study was carried out so as to meet the following objectives:

- Collect and analyze publications to establish the species composition of the forest prior to disturbance;
- Analyze the impacts of forest cover changes on the biodiversity of plants;
- Collect information on non-timber forest product uses by the local communities; and
- Suggest strategies for sustainable use of forest resources and conservation of biodiversity.

### 3.4 Review of literature

#### 3.4.1 The forest vegetation of southwest Ethiopia

The flora of southwestern Ethiopia has been among the least known in tropical Africa until recent years, mainly due to lack of access. Until the mid 20<sup>th</sup> century, surveys and descriptions of the forest vegetation were based on the observations of a few foreign travelers. O. Neumann and F. Bieber, a German and an Austrian traveler, respectively, reported the existence of rain forests in the region for the first time in 1906 (Friis *et al.* 1982). The plant specimens collected by Bieber in 1906 were not identified until Cufodontis performed this task in 1948 (Friis *et al.* 1982). Some Italian foresters also visited the forests of SW Ethiopia around the late 1930s and early 1940s (*e.g.*, Cufodontis 1939, 1940). The opening up of access roads in the 1960s facilitated botanical collection from the forests of the area. Among the many

botanical expeditions, the intensive collections and field surveys by Professor Ib Friis from the Institute of Systematic Botany, University of Copenhagen, during the last three decades constitute an important contribution to the knowledge of the forests of this region (Friis *et al.* 1982; Friis 1983, 1986a, 1986b, 1992; Friis and Sebsebe 2001). Other recent and more specific studies on the forests in the SW include regeneration ecology by Abayneh (1998) and plant community ecology by Kumelachew and Tamrat (2002), conservation oriented floristic diversity and human impact studies by Tadesse *et al.* (2002); Tadesse (2003); and Feyera *et al.* (2005).

Several authors attempted to classify the forest vegetation of Ethiopia (e.g. Pichi-Sermolli 1957; von Breitenbach 1963). The most widely accepted system of vegetation types for Africa is that of Greenway (1973), which was adopted for the vegetation map of southwestern Ethiopia (Friis *et al.* 1982). This system was also used as a basis to produce the second vegetation map of Africa and the accompanying descriptive memoir (White 1983). The studies of Friis (1992) are the latest in the series of developments towards a comprehensive classification and mapping of the forest vegetation of Ethiopia. According to Friis (1992), seven vegetation types occur in Ethiopia, namely: Dry peripheral semi-deciduous Guineo-Congolian forest, transitional rain forest, Afromontane rain forest, undifferentiated Afromontane forest of the Ethiopian highlands, dry single-dominant Afromontane forest of the Ethiopian highlands, dry single-dominant Afromontane forest of the escarpments and riverine forest. Among these, four forest vegetation types occur in SW Ethiopia. More detailed descriptions of these forests, namely: (A) dry peripheral semi-deciduous Guineo-Congolian forest, (B) transitional rain forest, (C) Afromontane rain forest, and (D) riverine forest, are given below.

**A) The dry peripheral semi-deciduous Guineo-Congolian forests** are restricted to the Baro lowlands, in Gambella State (formerly western part of the Illubabor Administrative Region). Chaffey (1979) was the first to make an inventory of such a forest. In the 1980s and later, several botanists and ecologists studied the forest. It occurs in a rather flat area with an altitudinal range of 450–600 m. The mean temperature is high, with a mean annual maximum of 35–38°C and a mean annual minimum of 18–20°C. The mean annual rainfall is between 1300 mm and 1800 mm, and the wettest period is between May and September. The forest occurs mainly on rocky or sandy and well-drained soils, and is semi-deciduous, with a 15–20 m tall continuous canopy of *Baphia abyssinica* (which is endemic to southwestern Ethiopia and adjacent areas of the Sudan), mixed with less common species such as *Celtis toka*, *Diospyros abyssinica*, *Lecaniodiscus fraxinifolius*, *Malacantha alnifolia*, *Trichilia prieureana*, *Zanha golungensis*, and *Zanthoxylum leprieurii*. Some species which emerge high above the main

canopy are: *Alstonia boonei*, *Antiaris toxicaria*, *Celtis gomphophylla*, and *Milicia excelsa*. Small trees such as *Acalypha neptunica*, *Erythroxylum fischeri*, *Tapura fischeri*, *Ziziphus pubescens*, and *Xylopiya parviflora* form a continuous stratum below the canopy. The shrub layer is composed of *Alchornea laxiflora*, *Argomuellera macrophylla*, *Mimulopsis solmisii*, *Oncoba spinosa*, *Oxyanthus speciosus*, *Rinorea ilicifolia*, and *Whitfieldia elongata*. Lianas are not common. However, the lower strata of the forest are often densely populated with woody climbers. There is no record of any epiphytic species. The ground is mostly covered with thick litter, and there are apparently very few species of forest floor herbs except *Streptogyna crinita*.

**B) The transitional rain forest** is found on the escarpments of the southwestern highlands in West Wellega, Illubabor, Bench-Maji, Kefa and Sheka zones, between the dry peripheral semi-deciduous Guineo-Congolian forest and the Afromontane rain forest. These forests occur at altitudes between 500 and 1500 m, partly in river valleys, and partly in areas with a high water table. The annual temperature ranges from 20–25°C. The mean annual rainfall is about 2000 mm, with rain falling all year round, the highest amounts falling in September. More detailed information about such forests is found in Chaffey (1979) and (Friis 1992). The transitional rain forests are similar in physiognomy and composition to the humid broad-leaved Afromontane rain forest of southwestern Ethiopia described below, with additional species from the lowland forest described above. However, a few species of forest trees or shrubs known in neither of these two forests appear to be restricted to the transitional forest. A list of these species includes: *Aningeria altissima*, *Anthocleista schweinfurthii*, *Campylospermum bukobense*, *Celtis philippensis*, *Celtis zenkeri*, *Croton sylvaticus*, *Dracaena fragrans*, *Elaeodendron buchananii*, *Eugenia bukobensis*, *Ficus exasperata*, *Garcinia huillensis*, *Manilkara butugi*, *Morus mesozygia*, *Phoenix reclinata*, *Strychnos mitis*, *Trichilia dregeana*, *Trilepisium madagascariense* and *Vepris dainellii*. Friis (1992) noted that this forest type may contain Guineo-Congolian forest species, which are not yet recorded in Ethiopia. This forest type, therefore, deserves further studies.

**C) Afromontane rain forest:** These forests occur in the SW highlands and on the Bale Mountains in the SE highlands of Ethiopia. They characteristically contain a mixture of *Podocarpus* and broad-leaved angiosperm species in the canopy, but *Podocarpus* becomes gradually more infrequent towards the southwest while *Aningeria adolfi-friederici* becomes more prominent in the same direction. The Afromontane rain forest of SW Ethiopia occurs in Wellega, Illubabor, Bench Maji, Kafa and Sheka zones. It is found between 1500 and 2500 m, with average annual temperatures of 18–20°C, and an annual rainfall between 1500 mm and 2000 mm, sometimes

even more than 2000 mm, with rain all year round, but a maximum in April-October. The highest mean rainfall recorded in the region is about 2600 at Tepi (Anonymous 1988). Such forests were studied by Logan (1946), Chaffey (1979), Friis *et al.* (1982), and Friis (1992). *Aningeria adolfi-friederici* is the tallest emergent species in the 20–30-m-high canopy layer. The main canopy trees of 10–30 m height include: *Albizia gummifera*, *A. schimperiana*, *A. grandibracteata*, *Blighia unijugata*, *Cassipourea malosana*, *Celtis africana*, *Croton macrostachyus*, *Ekebergia capensis*, *Euphorbia ampliphylla*, *Ficus sur*, *F. ovata*, *F. thonningii*, *Hallea rubrostipulata*, *Ilex mitis*, *Macaranga capensis*, *Ocotea kenyensis*, *Olea capensis* ssp. *welwitschii*, *Polyscias fulva*, *Schefflera abyssinica*, *Prunus africana*, *Sapium ellipticum*, and *Syzygium guineense* ssp. *afromontanum*. A discontinuous lower canopy of small trees (less than 10 m high) includes *Allophylus abyssinicus*, *Apodytes dimidiata*, *Bersama abyssinica*, *Brucea antidysentrica*, *Calpurnia aurea*, *Canthium oligocarpum*, *Chionanthus mildbraedii*, *Clausena anisata*, *Coffea arabica*, *Cyathea manniana*, *Deinbollia kilimandscharica*, *Dracaena afromontana*, *D. fragrans*, *D. steudneri*, *Ehretia cymosa*, *Ensete ventricosa*, *Erythrina brucei*, *Galiniera saxifraga*, *Lepidotrichilia volkensii*, *Lobelia giberroa*, *Milletia ferruginea*, *Nuxia congesta*, *Oncoba routledgei*, *Oxyanthus speciosus* ssp. *stenocarpus*, *Phoenix reclinata*, *Pittosporum viridiflorum* ‘ripicola’, *Psychotria orophila*, *Ritchiea albertsii*, *Rothmannia urcelliformis*, *Solanecio gigas*, *Solanecio manni*, *Teclea nobilis*, *Trema orientalis*, *Turraea holstii*, and *Vepris dainellii*. Lianas are common, and about 25 species have been recorded. Epiphytes are also numerous, and include ferns, lycopods, orchids, *Peperomia* spp. and *Scadoxus nutans*. The ground cover is very rich in herbs in areas where light is sufficient. More than 110 species have been recorded from such a forest (Friis 1992). Areas higher than 2300 m in Sheka and Kefa zones are mainly dominated by alpine bamboo (*Arundinaria alpina*).

**D) Riverine forest:** The riverine and riparian forest vegetation of the study area is very variable, the floristic composition being dependent on altitude and geographical location. Riverine forest in the Ethiopian Highlands can in general, include the following species: *Breonadia salicifolia*, *Ficus capreaefolia*, *Ficus vallis-choudae*, *Phoenix reclinata*, *Salix mucronata*, *Tamarindus indica*, and *Trichilia emetica* (Friis 1992). The riverine forest along Baro River above Gambella (Baro Lowlands) includes the following species: *Baphia abyssinica*, *Celtis toka*, *Lecaniodiscus fraxinifolius*, *Lepisanthes senegalensis*, *Malacantha alnifolia*, *Mallotus* sp., *Tapura fischeri*, *Trichilia retusta*, and *Ziziphus pubescens*. The shrubs include: *Grewia trichocarpa*. The climbers include: *Acridocarpus ugandensis*, *Cissus petiolata*, and *Tiliacora funifera* (Friis 1992).

### 3.4.2 Forest biodiversity and impacts of human use

Forests cover only less than 6% of the earth's total surface area (Hunter 1996) or 24% of the land surface. Out of this, tropical forests account only for 7% of the land surface (Wilson 1988), while they are home for more than half of the total number of species on earth. Because of their exceptional high levels of biological diversity, tropical forests are a challenge for the understanding of ecosystem structure and function, community organization, population dynamics, speciation, and the fundamental physiological, demographic and behavioural attributes that underlie these processes.

Tropical forests are important sources of timber, food, and medicine for human populations. They are also habitats for a majority of the earth's species. Accelerated human population growth in the tropics coupled with poverty has enhanced the negative human impact on the existing forest resource in the tropics. Tropical forests and forest resources are vanishing and being degraded rapidly as a result of conversion of forested land to agriculture and excessive exploitation of forests for fuelwood, construction material, and timber for export.

In general, the major threat to biodiversity today can be categorized as: habitat degradation and loss (*e.g.*, due to roads, dams, deforestation, desertification, draining, dredging, fire, contamination, *etc.*), over exploitation (Hunter 1996) and introduction of exotic species (King 1984; Dutton 1994; Hunter 1996). Today, the world's biological diversity is in greater jeopardy than it has been at any time in the last 65 million years (Ehrlich and Ehrlich 1981).

Afromontane forest vegetation of Africa occurs on isolated highlands and mountains stretching from Sierra Leone in the West to Somalia in the east and from the Red-Sea Hills in Sudan in the north to Cape Peninsula in the south (White 1978; Demel 1996). Among Afromontane forest regions, the East African Mountains have the richest and most diversified tree flora (Coetzee 1978; Tamrat 1994) and Avifauna (Moreau 1966; Campbell and Lack 1985). Both tree flora and avifauna get impoverished towards the north and the Ethiopian forests are notably depauperate in species richness (Moreau 1966; Campbell and Lack 1985; Tamrat 1994).

In Ethiopia, forest vegetation cover changes due to human impacts date back to *ca.* 2000 years, which is much older than in any other East African country (Tamrat 1994). High rate of population growth has led to deforestation for expansion of farmland, particularly in the highlands as most of the Ethiopian population is agrarian. The highest number of people is living on highland areas, which account for 60% of the arable lands of the country (Hurni 1992; Demel 1996).

The loss of forest cover on the highlands has resulted in soil erosion, land degradation, loss of biodiversity, and impoverishment of ecosystems which in turn has affected, and still continues to affect human and plant as well as animal welfare (Demel 1996). Highland forests of Ethiopia are important for streams and water conservation rather than for their commercial values (Legesse 1995). This was not realized earlier, and now we are facing drinking water problem, flooding and silting up of hydroelectric and irrigation dams in different parts of the country.

The challenge related to forest ecosystem degradation can be met only if efforts are made to maintain the remaining forests and restore the degraded ones (Demel 1996). The collection of biological and other relevant information is strongly needed before decisions affecting biodiversity of such forests are made (Olivieri *et al.* 1995).

### **3.4.3 Importance of Ethiopia's biodiversity and the need for conservation**

Biodiversity is not evenly distributed on the globe. Some areas are exceptionally rich in biodiversity. Hence, conservationists have developed different criteria to identify areas that are most important for biodiversity conservation globally, to enable decision and channel the little money available for conservation.

Many criteria can be used to identify areas which are of high priority for conservation (WCMC 1994). In general, the most important identifiable areas for biodiversity are those ecosystems and habitats that contain many species, and those that contain species that occur nowhere else (*i.e.*, endemic species), as well as ecosystems and habitats that are taken to be representative samples of major or rare ecosystems, or which contain large numbers of genetic lineages of economic value.

There are a number of ways in which representative samples of habitats can be chosen for conservation action at a global level. Three of the major criteria for selecting sites for investment should be *representativeness*, *complementarity* and *insurance* or *redundancy* (WCMC 1994). The first criterion is intended to ensure that adequate samples of distinct ecosystems are selected for management, and is uniquely relevant to making global choices. The criterion of complementarity is concerned with ensuring that samples of all distinct ecosystems within a country are included within its national system of protected areas. The third criterion indicates the need for some duplication in the coverage of such systems; so as to offset the risks of planning failure, project failure and other factors such as climate change.



The most known types of priority areas for conserving biodiversity include Endemic Bird Areas (EBAs), Centres of plant diversity, Biodiversity Hotspots, Megadiversity Countries, and Centers of Crop origin. Because of exceptionally high level of diversity and uniqueness of its flora and fauna, and the threats on them, Ethiopia is included for all types of global priority areas for conservation of biodiversity.

**A) Endemic bird areas:** There has been only one consistent and comprehensive global assessment of animal biodiversity at the level of ecoregions, which are ecologically distinct bio-geographical units comprising parts of countries or trans-frontier areas. This was a study of restricted-range bird species, which are those with an historical breeding range of 50,000 square kilometres or less (Bibby *et al.* 1992; EWNHS 1996). The study identified 221 endemic bird areas (EBAs) where such birds are confined, and scored them according to the number of restricted-range bird species per unit area in each EBA, their taxonomic uniqueness, and the level of endemism in each EBA among other animals and plants, yielding an index of overall biological importance. This was combined with an assessment of threat and current protection, to give an index of priority for conservation.

The study showed that about 26% of all bird species are limited to less than 5% of the world's land area. Conservation action on just 2% of total land area could greatly enhance the survival prospects of one in five of the world's birds, including a high proportion of those at risk. This is a very important finding, since the scale of the areas needing to be protected is well within the capacity of most countries to allocate to conservation purposes. It is also important to note that many cases of positive correlation between concentrations of restricted-range birds, and the location of other endemics, particularly vertebrates were found (Bibby *et al.* 1992; EWNHS 1996) found in. The fact that EBAs show high levels of endemism in relatively small areas of habitat means that although these sites are vulnerable because they are small, they are also excellent targets for focused, sustained and cost-effective conservation effort.

There are four EBAs in Ethiopia, namely: the Central Ethiopian Highlands, Jubba and Shabeelle valleys, Southern Ethiopian Highlands and Northern Ethiopia. The southwestern highland forest, however is not part of any of the EBAs.

**B) Centres of plant diversity:** The only worldwide study of plant biodiversity at an ecoregional level, comparable to that on EBAs, has involved defining about 250 centres of plant diversity (CPDs) (WWF and IUCN 1994). These are defined as areas which are known to be rich in species and endemics, and to fulfil several other or related criteria, including the presence of an important gene pool of plants of value to people, a diverse

concentration of habitat types, a high proportion of species adapted to local soil conditions, and some degree of threat to the ecological integrity of the area. The locations which fulfil these criteria tend to be isolated geographical units such as islands and mountains, or mountain ranges, or else are distinctive floristic provinces. The Ethiopian highlands, including the forest areas in the SW are among areas identified as the CPDs globally.

**C) Biodiversity Hotspots:** In order to concentrate resources on those areas that are most vulnerable, conservationists have identified certain areas as biodiversity “hotspots.” The term was first used by British ecologist Norman Myers in 1988 to designate areas in which there is a disproportionate number of endemic species (species that are found nowhere else) and which are losing habitat at a high rate. The revised biodiversity ‘hotspots’ (Mittermeier et al. 2005) identified 34 “hotspots” that together comprise only 1.4 per cent of the Earth’s surface yet contain 44 per cent of all species of higher plants and 35 per cent of all land vertebrate species.

Hotspots are defined according to their plant vegetation. According to Myers’s definition, a hotspot has to contain at least 0.5 per cent of the world’s 300,000 plant species as endemics. Plants are important because vegetation is what determines the primary productivity of an ecosystem. Most, but not all, of the hotspots are in tropical areas; many are in developing countries where populations rely on species-rich ecosystems for food, firewood, cropland, and income from timber.

Two of the 34 hotspots are found in Ethiopia, namely the Eastern Afromontane and the Horn of Africa hotspot areas. The forests in SW highlands, including those of Masha-Anderacha areas in Sheka Zone fall within the Eastern Afromontane Hotspot. Notable economically important species from the Eastern Afromontane hotspot are trees of the genera *Podocarpus* and *Juniperus*, and several crops including coffee (*Coffea arabica*) and teff (*Eragrostis tef*) from the Ethiopian Highlands.

**D) Megadiversity countries:** Subsequent work on species richness and endemism for a range of different taxa after the identification of ‘hotspots’, conservationists (Mittermeier and Werner 1990; McNeely et al. 1990) identified several ‘megadiversity’ countries. This approach has been developed further by WCMC, drawing on increasingly comprehensive documentation of biodiversity for all countries.

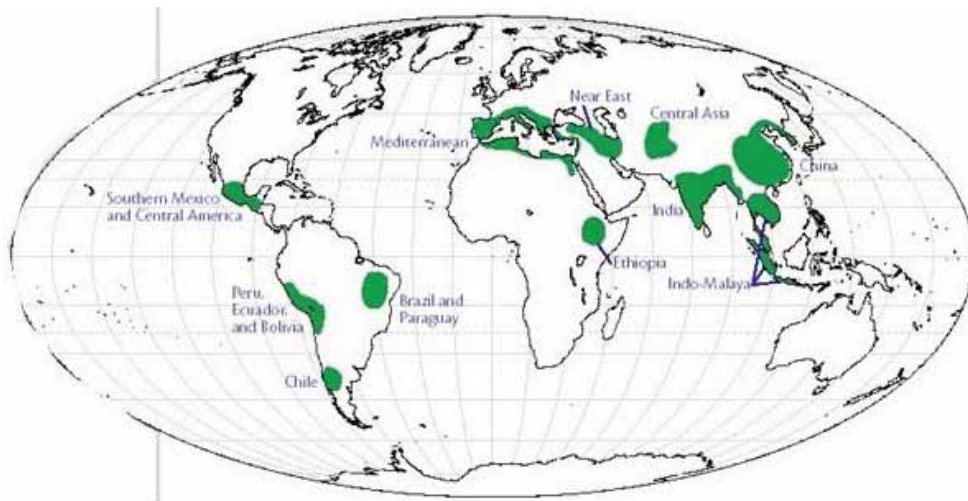
Fifty countries with high species richness and endemism in different groups of organisms, *i.e.*, mammals, birds, amphibians, reptiles, swallowtail butterflies and angiosperms were identified. McNeely et al. (1990) suggest that the 50 countries or territories which possess most species and most endemism can be divided into two groups, as follows, with the countries in each listed in alphabetical order:

**Group 1** (the 25 most biodiverse countries): Argentina, Australia, Bolivia, Brazil, Cameroon, China, Colombia, Costa Rica, Ecuador, Ethiopia, India, Indonesia, Madagascar, Malaysia, México, Papua New Guinea, Perú, the Philippines, South Africa, Tanzania, the USA, [ex-USSR], Venezuela, Viet Nam and Zaire; and

**Group 2** (the 25 next most biodiverse countries): Angola, Botswana, Cambodia, Central African Republic, Chile, Congo, Côte d'Ivoire, Cuba, Gabon, Ghana, Guatemala, Guyana, Iran, Kenya, Laos, Myanmar, Nigeria, Panama, Paraguay, Sudan, Suriname, Thailand, Turkey, Uganda and Zambia.

As listed above, Ethiopia is one of the top 25 countries rich in biodiversity. The majority of these species are assumed to be found in the highland forests, which are mainly located in the south-western highlands.

**E) Centers of crop origin and diversity:** Ethiopia has high genetic resources of crop plants, livestock and microorganisms. However, the country is more known for its high genetic resources of cultivated plant species or crops. This is partly attributed to the very long history of agriculture. There are around 12 centers of crop genetic resources, among which Ethiopia is one of the most diverse centers. Ethiopia is the center of origin and diversity for crops such as coffee, teff, Niger seed, and Ensete. About 38 crop plants are believed to have their center of gene diversity in Ethiopia.



**Figure 3.1** The centers of crop genetic resources of the world

Some of the important economic plants with high genetic diversity in Ethiopian center include: durum wheat, poulard wheat, emmer, barley, teff, African millet, chickpea, lentil, pea, coffee, flax, sesame, castor bean, niger seed, Ethiopian mustard, sorghum, linseed, safflower, faba bean, field pea, chickpea, cowpea, fenugreek, grasspea, Enset, anchote (*Coccinia abyssinica*), 'Oromo dinich' or edible coleus (*Coleus edulis*) cabbage, rape seed, and other lesser appreciated but potentially useful plants like 'noya' (*Veronia galamensis* subsp. *galamensis*).

It is important to note that coffee (*Coffea arabica*), anchote (*Coccinia abyssinica*), and 'Oromo dinich' or edible coleus (*Coleus edulis*) have their centers of origin and diversification in the highland forests of SW Ethiopia.

### **3.5 Materials and methods**

#### **3.5.1 The study areas**

Vegetation survey was carried out in forest areas in Masha and Anderacha Woredas. In Masha Wereda, the study covered parts of forests in four *kebeles*, namely: *Beto*, *Welo Shoba*, *Keja-Chewaka*, and *Uwa* and the tea plantation. In Anderacha Woreda, the study focused on forest areas in two *kebeles*, namely Gemadro and Yokichichi, and the Gemadro Coffee Plantation.

#### **3.5.2 Vegetation survey methods**

Systematic sampling method was used to sample the forest vegetation. The size of the sampling plot was 10 m x 50 m, with the longest side along the steepest gradient in slope. The plots were laid along line transects that fall along the steepest altitudinal gradient. The distance between plots was 200 meters. Five plots were studied in each forest area. List of plant species and their relative abundance, or per cent cover were recorded in each plot. Plant species encountered on line transects between plots were also noted. Transect walk with key informants was also used to record plants in the forest areas that were not covered by sample plots, and within coffee and tea plantation. Phenology and local uses of major plant species were also noted.

Environmental variables recorded in the study plots include geographic location (GPS coordinates), altitude, slope, aspect, forest status (disturbance level), forest type (also based on indigenous classification), and the dominant species. Local key informants (usually two and sometimes three in number) provided local names of plants for identification and shared knowledge on local plant uses.

### 3.6 The study findings

#### 3.6.1 Floristic diversity

The checklist of plants includes both cultivated and wild plants observed during the study period in nearby farms and homegardens. A total of 80 and 72 plant species were recorded in five study plots of the forests around Masha and Anderacha, respectively. The mean numbers of species recorded per plot were 32 and 27 for the two forest areas. The study areas are very important for threatened species such as *Prunus africana* and rare and endemic species such as *Canarina abyssinica*.

#### 3.6.2 Peoples dependency on forest resources

##### 3.6.2.1 Use of non timber forest products

Most of the plant species recorded in all areas have one or more types of local uses, which shows quite high dependency of the local community in Sheka Zone on several plant species from the forest (see Appendix 3).

The major non-timber forest products (NTFPs) recorded in this study can be categorized into: food, fodder, local construction materials, medicine, spices, honey, farm implements, household furniture and fuelwood. Most of the NTFPs are only used locally, and few are for both local use and income generation. The NTFPs that are used locally and also sold for income generation include honey, spices, coffee and bamboo. The sources of the spices are Korerima (*Aframomum corrorima*) and Timiz/long pepper (*Piper capense*), while coffee beans are harvested from *Coffea arabica*. Bamboo is used locally for several construction purposes and has a great potential to be developed and used for income generation. Coffee production for income generation was began in Aderacha *Woreda* following the establishment of the Gemadro Coffee Plantation, and is not common in Masha *Woreda*.

##### 3.6.2.2 Management of the forest for NTFPs production

###### Coffee

Coffee (*Coffea arabica* L.) belongs to the family Rubiaceae. It is native to Ethiopia, and the wild populations are mainly restricted to the mountain forests of southern and southwestern parts of the country. Today, it is the most widely cultivated coffee in the world, dominating over 70% of the production and 90% of the market. Ethiopia has the largest highland plateaus suitable to coffee production in the world. However, its place in the world

coffee industry is not that high since the coffee production is very traditional; the main production systems are restricted to forest, semi-forest and garden coffee.

The coffee production system in the study area is mainly garden coffee production. The shade trees are naturally regenerate mainly, and it seems to be a recently transformed system from natural forest. It resembles what some authors call forest gardens (Wiersum 2004). In some gardens where there are few or no naturally regenerating shade trees, farmers plant trees like *Sesbania sesban* and *Millettia ferruginea*. These species are preferred since they grow fast, have moderate shade density, and can produce some biomass for fuelwood.

### **Honey**

Beekeeping is considered as one of the oldest professions of humankind. Ethiopia probably has the longest tradition of beekeeping in the world (Fichtl and Admasu 1994). The country is considered as a potential beekeeping giant, having wide ecological zones ranging from deserts in the lowlands to mountain rainforests and alpine habitats in the highlands (Hussein 2000). With about 10 million bee colonies, the country has the highest bee density in Africa (Hartmann 2004). The country is also the fourth largest beeswax producer after China, Mexico, and Turkey, and the largest honey producer in Africa and the tenth in the world (Fichtl and Admasu 1994). Annually 24,000 tons of honey is produced in Ethiopia, 24% of the African production, representing a value of about 450 million Birr. However, the potential of the industry is underutilized because of the traditional beekeeping methods. In the southwest forest areas, beehives are mainly made from logs, bark and bamboo. These beehives affect honey quality, making export difficult. On the other hand, quality problems do not affect wax and hence Ethiopia is a leading exporter of this product on the continent. By using modern beehives, the yield can increase five-fold, and the quality can also be improved.

The Sheka Zone, especially Masha and Anderacha *Woredas* have high potential for honey production, since there are very diverse honeybee flora. The plant species that are considered as the most important honeybee flora by the farmers and their flowering periods are presented in Table 3.1. However, these species are not the only bee forages. There are several other species that can be used as bee forage (Appendix 3).

**Table 3.1 Major honeybee flora in Masha and Anderacha Woredas and their flowering periods (Tadesse and Ararsa 2004)**

Local name	Species	Flowering period, local knowledge	Flowering time from literature*
Bu'aro	<i>Dombeya torida</i>	December – January	October-December
Cago	<i>Maesa lanceolata</i>	June – August	All year round
Dangratto	<i>Vernonia auriculifera</i>	January – February	November-May
Fishino	<i>Dracaena afromontana</i>	December	Na
Girawwo	<i>Vernonia amygdalina</i>	January – February	December-May
Manjo	<i>Schefflera abyssinica</i>	February – May	March-May
Ororo	<i>Ekebergia capensis</i>	December-January	November-May
Qeto	<i>Ilex mitis</i>	October - November	September-November
Qoro	<i>Isoglossa</i> sp.	January – February	
Sha'o	<i>Aningeria adolfi-friederichi</i>	January –February	January-February
She'o	<i>Allophylus abyssinicus</i>	August – September	May-November
Shomo	<i>Croton macrostachyus</i>	April – June	April-July
Shudde**		April	
Tufo	<i>Guizotia scabra</i>	November	August-February
Wundabo	<i>Apodytes dimidiata</i>	February – April3	December-March
Yebo	<i>Phoenix reclinata</i>	Year round	October-December
Yeho	<i>Olea welwitschi</i>	January-April	July-September
Yino	<i>Syzygium guineense</i>	December – January	December-May

\* Source: (Fitchl and Admasu 1994; Thirakul, n.d.)

\*\*Shuddee flowers every seven years, and dies afterwards, like bamboo. We have not seen this plant, and hence not identified.

### Korerima

Korerima (*Aframomum corrorima*) is the major type of spice produced in the area. *Aframomum corrorima* (the Ethiopian cardamom) belongs to the family Zingiberaceae, and is endemic to the mountain rainforests of the southwest. Korerima is a renowned spice and medicinal plant. The dried fruits are used in the daily dishes of most Ethiopians. They are also used as a carminative, purgative and tonic in traditional medicine (Jansen 1981). Korerima oil has similar chemical composition with its close relative, the Indian cardamom (*Elettaria cardamomum*), except for its reduced content of terpinyl acetate, which is the major component in the latter (Sebsebe 1993). Ethiopia used to export a considerably high quantity of Korerima capsules to the world market, mainly as a substitute for the Indian cardamom (Jansen 1981). Korerima has some superior qualities compared to Indian cardamom: it has a relatively wider adaptation and higher productivity (ca. 5.5 fold), a

factor that could have attracted producers' interest to expand its production (Wondyifraw and Wannakraioj 2004).

However, there is little effort of domestication and expanding plantation due to lack of a sustainable market outlet, absence of processing industries and high yielding cultivars of superior quality, and a shortage of planting materials (EARO 2000). Vegetative propagation, involving rhizome splits with one old and another young sucker, is the conventional technique used in Korerima. The method shortens the juvenile phase of the stand and also enables propagation of true-to-type plants of a desired clone.

In Masha area, Korerima is common everywhere in the forest but at spots (patchy), preferring small forest gaps both in the primary and secondary forests. Korerima is harvested from November to January, but it sometimes also bears fruits starting from June. It is ripe and ready for harvest when the fruit has become red, but people usually start collecting when it is still green to get it prior to damage by baboons and snakes. Collection is mainly from the wild.

In Anderacha, around Gemadro *Kebele*, Korerima is common at the lower altitudes mainly on the west side of the main road from Masha to Tepi. In this area, Korerima is either cultivated in homegarden, managed in the natural forest, or collected directly from the wild without any management. When people manage forest Korerima, they weed herbs and shrubs around plants growing in the wild. Occasionally, they also plant Korerima in large gaps using suckers taken from dense parts. The weeding, which is carried out once a year, enhances the Korerima plants to fully cover the weeded range reducing its patchy distribution in the wild.

### **Pepper**

Long pepper (*Piper capense* L.f.) belongs to the Piperaceae family. The species is indigenous to Ethiopia, occurring in the mountain rainforests of Wellega, Illubabor and Kaffa. It is also widely distributed in Africa, occurring in the west upto Sierra Leone and in the south upto the Cape Province, South Africa.

Many species of the genus are important spices such as black and white pepper (Jirovetz 2002) and also bear essential oils for industrial use. Oils from *Piper* sp. can be used in beverage industry, as a tropical antiseptic and pediculicide, in household products such as floor waxes, polishes, soaps, detergents and cleaning agents. In Ethiopia, the dried seeds of long pepper are used as an additive to the spices used in the daily dishes. The species can



be used as a substitute of black pepper and has a potential for commercial production. It is totally harvested from wild plants, but it normally grows at forest margins and disturbed areas or in forest gaps.

### **Bamboo**

Bamboos are perennial woody grasses, belonging to the Poaceae (Gramineae) family and Bambuseae subfamily (Ohrnberger 1999). Since most of them have tree morphology and attain tree size at maturity, they are often called tree-grasses (Woldemichael 1980). The main stem of the aerial part is called culm, while the underground constitutes the rhizome and root system. The culm of the Ethiopian highland bamboo is hollow. The rhizome is the food store of the plant, which also serves as a structure on which the culms depend for their mechanical anchorage, growth, vigor and spacing (Liese 1985).

Bamboo is the fastest growing perennial plant. Once the rhizome and root system is well established, new bamboo shoots attain full height and diameter growth within 2–3 months (Liese 1985). They mature and attain full strength, becoming ready for utilization after 2–3 years (Virtucio 1990).

About 1.5 million hectares are covered with bamboo in Africa (Kigomo 1988). Ethiopia has about 1 million hectare of land covered with bamboo, out of which 850,000 ha is covered with lowland bamboo (*Oxytenanthera abyssinica*) and the remaining 150,000 ha by alpine bamboo (*Arundinaria alpina*). This represents about 67% of African bamboo resource and more than 7% of the world resource (Kassahun 1999).

*Arundinaria alpina* occurs on the highland plateau in different parts of the country. The *A. alpina* forests exist almost pure in clumps in semi-humid mountain woodlands usually at 2300 and above in the study area.

The communities in Masha and Anderacha are heavily dependent on bamboo for their livelihood. The plant has several local uses: construction (fence and house), beehive (both culm and sheath are used), floor mat, chairs, baskets, *Dollo* (water container), cups, *Gamo* (traditional tray), pipe used for smoking tobacco, bed, food, *etc.* It is also sharpened like a knife and used to separate carbohydrate/edible parts of *ensete* from the fiber. The bamboo forest ecosystem has also several other services like habitat for wildlife and watershed protection.

According to local ecological knowledge, alpine bamboo finishes height and diameter growth in three months. It can be harvested for any use after the age of three, but people usually harvest stems older than 5 years. According

to the key informants bamboo plants younger than 3 years should not be harvested, since reproduction from suckers is only from individuals that are at the age of 1–3 years. Harvesting young bamboo will halt regeneration and enhance invasion by woody plants. Harvesting old bamboos also has additional advantages: old stems have lower water content, are lighter and hence easy to transport. Old stems are also durable, particularly when used for construction purposes. For instance, fences made from old bamboos can last for 4 years. For beehive construction, however, stems of age 3–4 years are preferred.

Bamboo is harvested from the interior, leaving some around the boundary as harvesting from the edge may lead to woody plant invasion. The edges are considered as developmental frontiers. If the edge is not harvested, on the other hand, bamboo can gradually expand outwards.

The way bamboo is harvested by outsiders who buy it from the local government is becoming a major concern for the local community, as they clear-cut stands without leaving some at the edges. The practice kills the whole rhizomes and hampers regeneration, leading to invasion by trees.

### **3.6.3 Impacts of cover changes on forest vegetation, and floristic diversity**

#### *3.6.3.1 Impact of landuse change on plant diversity in Chewaka-Uto*

The main changes in landuse in Chewaka-Uto area are conversions of forestlands to monoculture plantations (tea and eucalyptus) and to agriculture.

The EAA has concession of 3435 ha to establish tea plantations, along which some areas are planted with eucalyptus for fuelwood used in tea processing. Up to now, EAA has cleared and established tea and eucalyptus plantation on 1025 ha (see Chapter 2). The impact of such conversion can be seen from two aspects: loss of biodiversity and loss of sustainable traditional farming practices and the livelihood of the local community. Clearance of the natural forest vegetation and planting tea and eucalyptus resulted in loss of high biodiversity of plants, forest ecosystem and its services and many animal species that are dependent on such ecosystem. Both the tea and eucalyptus plantations are pure monoculture stands, except for some exotic tree species such as *Gravillea robusta* planted along the edges of tea plantation (Figure 3.2).



**Figure 3.2** Tea plantation, with *Gravillea* planted on the edge

Conversion to plantation also led to loss of traditional bee-farming practices and loss of livelihood of the local community. Traditional bee-farming contributed to conservation of biodiversity since farmers protect the forest. High tree cover is maintained since bees forage on flowers of trees, and the traditional bee-hives are hanged on branches of trees. Lost with the forest are also the different non-timber forest products and uses that the local community derives from different plant species. Such clearance also affected the cultural practices of the local community who consider the forests as sacred.

Conversion of large areas to agriculture has severely reduced biodiversity (see Figure 3.3). Conversion to agriculture has also resulted in loss of quite large proportion of the forest. However, agriculture is by far better than tea plantation since many native tree species are left on and along the boundaries of farmlands and on hillsides. Such farmlands are often abandoned, and the areas recover through natural regeneration (see Appendixes 1 and 2). Besides, the farmers continue to earn their livelihood from such agriculture, while still producing honey using modern beehives in homegarden (see Figure 3.4). Such practice of honey production can not be realized in plantations where there are almost no trees for bee-forage and

where there is heavy application of insecticides which also kill the honeybees.



Figure 3.3 Areas converted to agriculture



Figure 3.4 Locally produced modern beehives- Kenya-top-bar type in Beto Kebele, around Masha

### 3.6.4 Impact of landuse change on plant diversity in Gemadro

The Gemadro Coffee Plantation lies between 1250–1950 m altitude. The coffee plantation was established in 1999 (or 1991 E.C.) by clearing dense, undisturbed forest. Upto now, a total of 1052 ha, *i.e.*, 1010 ha for coffee, 22 ha for spices and 20 ha for *Endod* plantation has been deforested.

The establishment of Gemadro plantation has affected the forest biodiversity directly through clearing of the forest, and indirectly by encouraging farmers in the areas to convert natural forest to coffee plantation.

Compared to other coffee production systems in the southwest, Gemadro can be described as very destructive similar to cereal crop based agriculture. In traditionally managed forest coffee in the region, about 300 trees/ha of diverse species are left as shade trees. In Gemadro, however, not more than 20 shade trees/ha, representing very few species of native trees, are left as shade trees for coffee. Most of the native trees were cleared and gave way for exotic species like *Sesbania sesban* as temporary shade during establishment (Figure 3.5).



**Figure 3.5** Typical representation of the Gemadro coffee plantation, with temporary shade of *sesbania*

In the Endod plantation, all trees and shrubs have been totally cleared, reducing the species composition to monoculture as in the case of tea plantation. Similarly, in black pepper plantation, the native trees were all cleared and replaced by exotic tree species such as *Gravilea robusta* for support.

Deforestation of the pristine forest is not restricted to large size coffee plantations. Many small farmers have also followed suite through small scale coffee plantations. The *woreda* administration allocates up to 10 ha forestland for individual farmers for coffee plantation. Unlike most coffee growing areas in the southwest, coffee does not occur naturally in the Gemadro area. Hence planting coffee is a new phenomenon in the area. Farmers have picked up planting coffee without shade trees, cutting down the trees. Such practice has threatened the long existing honey production in the region. If the practice of coffee planting continues, most of the forests in the region would be lost very soon. As indicated in the next section, large areas of the forest have already been given to investors for coffee plantation. Even though the area is known for spices and honey productions, which are more environmentally friendly, farmers are more engaged in coffee production today, encouraged by *woreda* administration.

### 3.6.5 Forest resilience to cover changes

Survey of the composition of an undisturbed natural forest and a secondary forest around Masha of about 20 years old resulted in similar vegetation structure and species composition (Table 3.2).

In some plots, the number of species recorded in secondary forest was even higher than in the primary forest. The secondary forest could easily recover since the primary forest was nearby and could serve as seed source.

**Table 3.2 Number of woody plant species recorded in sample plots in Masha and Anderacha**

Forest area	Slope	Aspect	Altitude	Disturbance level	Woody species/ plot
Anderacha	5	5	1820	Primary	26
Anderacha	5	5	1790	Primary	21
Anderacha	10	5	<b>2215</b>	Primary	14
Anderacha	5	7	2230	Primary	18
Anderacha	10	5	2260	Primary	15
Masha	5	1	1850	Primary	23
Masha	5	1	1800	Secondary	24
Masha	5	1	1750	Secondary	23
Masha	3	2	1890	Secondary	38
Masha	1	2	1930	Secondary	17

### 3.7 Discussion

The Afromontane rainforest of southwestern Ethiopia is known to be very rich in plant species diversity (Tadesse 2003). Being one of the most floristically diverse forest areas in Ethiopia, the Masha-Anderacha forest can be considered as an important area for biodiversity conservation. The diversity of plant species and presence of useful plants such as Korerima also make the forest more attractive for research on the biodiversity of other taxa such as birds, insects and mammals. Diversity level of species of different taxa such as flowering plants, birds, insects and mammals have been found to be strongly correlated at a large regional scale (Bibby *et al.* 1992; Kay *et al.* 1997; Statterfield *et al.* 1998; Brooks *et al.* 2001), even though other studies at fine scales for reserve planning found poor correlation (Flather *et al.* 1997; Howard *et al.* 1998; Van Jaarsveld *et al.* 1998). The southwestern rainforest is very interesting in this respect as several groups of researchers are showing interest. On a recent expedition, ornithologists discovered three birds that are not taxonomically determined at species level and might in fact be new species (Anteneh Shimelis, personal communication). Similarly, some studies on the diversity of spiders in SW forest added many new species to the Ethiopian list, of which few can even be new to science (Negusu Aklilu, personal communication).

Because of the presence of high species diversity, and the ongoing threats on these forests, the Masha-Anderacha forest areas have been demarcated as one of the National Forest Priority Areas in Ethiopia (Kumelachew and Simon 2004). The area is also recognized globally as a priority area for conservation of biodiversity as part of the Eastern Afromontane Hotspot (Mittermeier *et al.* 2005).

Conserving biodiversity is one of the greatest challenges to humanity today. Habitat conversion or modification by human beings to produce goods and services is the most substantial human alteration of ecosystems threatening biodiversity (Chapin *et al.* 2000). Changes in forest cover to agriculture and monoculture plantations are the major threats to forest biodiversity in Masha and Anderacha *Woredas*. Areas converted to agriculture have chances for reforestation since shifting cultivation is being practiced by the farmers. However, recent changes show that the rate of deforestation for agriculture is much higher than the rate of forest recolonization (seen Chapter 2). On the other hand plantations of coffee and tea convert forests permanently, and hence their impact on biodiversity and local livelihood is immense.

Changes in vegetation cover due to management have some implications for the conservation of plant species diversity and composition, and diversity and composition of different animal groups that depend on the forest ecosystems. The major groups of plant species of conservation concern in the region affected by human impact are the Ethiopian endemics, the threatened species, and the Afromontane endemic tree species. From the Ethiopian endemics, the population of *Vepris dainelli*, *Scadoxus nutans* and *Canarina abyssinica* are the important ones which are affected seriously by deforestation. Among the plant species in the threatened category, *Prunus africana* is globally threatened, and categorized as vulnerable (IUCN 2002), while *Cordia africana* is locally threatened and is given protection by proclamation (Government of Ethiopia, Proclamation No. 94/1994). The Masha and Anderacha forests are also important for several species endemic or near-endemic to the Afromontane forest vegetation. More than 50% of the area covered by such vegetation is found within the Ethiopian boundary (Yalden 1983), which includes the forests in this area. The forest in this area is also unique in having a large number of rainforest species similar to those found in the west and central part of Africa. Studies in other parts of the world (Barthlott *et al.* 2001) showed that the diversity and abundance of epiphytes decreased by 50% in disturbed and secondary forests as compared to primary montane rainforests in the Andes. Given the frequent disturbance and degradation of forests in this area, similar levels of changes are expected to have occurred in epiphytes and other groups of plant species in the forest of Masha and Anderacha. Tadesse (2003) also reported that managing forest for coffee production has resulted in significant changes in species diversity, composition and vegetation structure in coffee forests of SW Ethiopia.

The Masha-Anderacha forest is part of the Mettu-Gore-Tepi Important Bird Area (EWNHS 1996), an important priority area for the conservation of highland forest bird species in Ethiopia. It also harbors several small mammals, especially primates. Studies on the effect of disturbance on different animal groups show that changes in forest cover, structure and composition are detrimental for their survival. For instance, Thiollay (1997; 1999) found that changes in forest structure negatively affect the forest birds. The most affected groups of birds were mature forest understorey species. Similarly, the composition and diversity of other animal groups like primates (Onderdonk and Chapman 1999), bats (Schulze *et al.* 2000), ants (Vasconcelos 1999), and butterflies (Hill *et al.* 1995; Hamer *et al.* 1996; Hill 1999) are also negatively affected by forest disturbance. Though there is no similar study about the impacts of forest disturbance on any of the animals groups, it is assumed that many rare and habitat-specific species are affected by forest cover changes in the Masha-Anderacha forests.



### 3.8 Conclusions

The two main causes of deforestation in Masha and Anderacha *Woredas* of Sheka Zone are investment in plantations and conversion to agriculture. In most parts, the conversion to agriculture is even more extensive. However, the impact of agriculture is a cumulative effect of several years of practices. Often farmlands are abandoned which allow natural regeneration of the forests. The traditional farming system mainly constitutes perennial crops, while maintaining some trees on farm.

There is high potential for production of high quality NTFPs such as honey, spices and different products from bamboo in large quantity, while still conserving biodiversity. However, the production technologies currently utilized are mostly traditional with low efficiency and productivity. By improving the production techniques, productivity and product quality can be improved, which can encourage the continuation of forest based livelihoods of the local community. This can allow sustainable use of resources and conservation of biodiversity, by reducing conversion of forest areas to agriculture.

The increasing trend of converting forest areas to plantations, however, remains to be the biggest threat to the forest biodiversity and local livelihood. Unless investments in monoculture plantations are checked at the current state, the last forests of Ethiopia remaining in the region, and the associated biodiversity and ecosystem services will be lost in few decades.

### 3.9 Recommendations

Given the importance of the area for biodiversity conservation, local livelihood, and national desire for economic growth, the following measures/activities are recommended:

1. Detailed studies on the flora and fauna of different forest cover types, their potential and sustainability, and preparation of land suitability and capability maps for proper land use planning.

2. Identification of degraded areas for investments which involve rehabilitation, and sustainable forest management like spices, honey and coffee production, and eco-tourism.
3. Investment in coffee production should be allowed in degraded forest areas, and should be based on pre-set management guidelines, so that it contributes to the conservation of both coffee genetic resources and the forest biodiversity. Mimicking the natural coffee forest by planting coffee seedlings of wild origin can convert the forest into productive coffee gene reserve.
4. Lessons from participatory forest management (PFM) in other parts of the country such as Bale, Borana and Bonga show that participation of the local community in management and decisions, and benefit sharing from the forest products can contribute to halt deforestation and forest degradation. Hence, PFM should be implemented in the area. With long tradition of managing forest for NTFPs, presence of high dependency on such NTFPs for livelihood, and the existence of customary tree/forest tenure system (*Kobo*), adoption of the PFM arrangement to the local condition, and recognition and legalization of the roles and responsibilities of the local community can successfully strengthen the sustainable use of forest resources. Through PFM, the local communities can earn income by implementing different micro-projects with external support. Projects on the following alternative forest management options can contribute to the sustainable use of forest resources and conservation of biodiversity:
  - a. Spices production, processing and marketing: The area is suitable for many humid area spices like Korerima, pepper and perhaps, vanilla.
  - b. Bamboo based handicrafts and small-scale industry development: Even though there is a huge bamboo resource, the local technology is low or poor to use it appropriately.
  - c. Honey production, processing, packaging and marketing. Honey being the major source of income in the area, improving quality can increase income to the community.
  - d. Domestication and establishing *Prunus africana* plantations on farmland- for bark production
  - e. Eco-tourism: The area is endowed with beautiful landscape, small alpine lakes, rivers, pristine forest habitat and many

species of wild animals, especially forest birds which have high values of ecotourism.

### 3.10 References

- Abayneh Dererro (1998). Natural regeneration in a broad-leaved Afromontane rain forest, South West Ethiopia. M.Sc. Thesis, Swedish University of Agricultural Sciences, Uppsala, Sweden.
- Alemneh Dejene (1990). Environment, famine and politics in Ethiopia: a view from the village. Lynne Rienner Publishers, Boulder
- Anonymous (1988). National Atlas of Ethiopia. Ethiopian Mapping Agency, Addis Ababa.
- Barthlott W., Schmit-Neuerburg V., Nieder J. and Engwald S.(2001). Diversity and abundance of vascular epiphytes: a comparison of secondary vegetation and primary montane rain forest in the Venezuelan Andes. *Plant Ecology* **152**:145–156.
- Bibby, C.J., Crosby, M.J., Johnson, T.H., Long, A.J., Statterfield, A.J. and Thirgood, S.J. (1992). Putting biodiversity on the map: global priorities for conservation. ICBP, Cambridge.
- Brooks, T., Balmford, A., Burgess, N., Hansen, L.A., Moore, J., Rahbek, C., Williams, P., Bennun, L.A., Byaruhanga, A., Kasoma, P., Njoroge, P., Pomeroy, D. and Mengistu Wondafrash. (2001). Conservation priorities for birds and biodiversity: do East African Important Bird Areas represent species diversity in other terrestrial vertebrate groups? *Ostrich S* **15**:3–112.
- Campbell, B. and Lack, E. (1985). A Dictionary of Birds. Academic Press.
- Chaffey, D.R. (1979). Southwest Ethiopia forest inventory project: a reconnaissance inventory of forest in southwest Ethiopia. Ministry of Overseas Development. Land Resources Development Centre. Project Report **31**:1–316.
- Chapin, F.S., Zavaleta, E.S., Eviner, V.T., Naylor, R.L., Vitousek, P.M., Reynolds, H.L., Hooper, D.U., Lavorel, S., Sala, O.E., Hobbie, S.E., Mack, M.C. and Díaz, S. (2000). Consequences of changing biodiversity. *Nature* **405**:234–242.
- Coetsee, J.A. (1978). Phytogeographical aspects of the montane forests of the chain of mountains on the eastern side of Africa. *Erdwiss. Forsch.* **11**:482–494.
- Cufodontis, G. (1939). Introduzione, Sterculiaceae, etc. **In**: Zavattari, E. (Eded.) Missione Biologica nel Paese dei Borana, 4. Raccolte Botniche. Roma.
- Cufodontis, G. (1940). La Vegetazione. **In**: Missione Biologica nel Paese dei Borana. Vol. Primo. (Zavattari E., ed.) Reale Accademina d'Italia, Roma, Italy, pp. 142–255.

- Demel Teketay (1996). Seed ecology and regeneration in dry Afromontane forests of Ethiopia. Doctoral thesis. Umeå, Sweden. Section V.
- Dutton, J. (1994). Introduced Mammals in Sao Tome, and Principe: possible threats to biodiversity. *Biodiversity and Conservation* **3**:927–938.
- Ehrlich, P.R. and Ehrlich, A.H. (1981). Extinction: the causes and consequences of the disturbance of species. Random House, New York.
- EARO (2000). National research strategy for spices, medicinal and other essential oil bearing plants. Ethiopian Agricultural Research Organization (EARO), Addis Ababa, Ethiopian Wildlife and Natural History Society (EWNHS). 1996. Important Bird Areas of Ethiopia: A first inventory. EWNHS, Addis Ababa.
- EWNHS (1996). Important Bird Areas of Ethiopia: A first inventory. Ethiopian Wildlife and Natural History Society, Addis Ababa.
- Feyera Senbeta, Schmitt, C., Denich, M, Sebsebe Demissew, Vlek, P.L.G, Preisinger, H., Tadesse Woldemariam, and Demel Teketay (2005). The diversity and distribution of lianas in the Afromontane rain forests of Ethiopia. *Diversity and Distributions* **11**:443–452.
- Fichtl, R. and Admasu Adi (1994). Honey bee flora of Ethiopia. DED and Margalef Verlag, Weikersheim
- Flather, C.H., Wilson, K.R., Dean, D.J. and McComb, W.C. (1997). Identifying gaps in conservation networks: Of indicators and uncertainty in geographic-based analyses. *Ecol. Appl.* **7**:531–542.
- Friis I. (1983). Phytogeography of the tropical northeast African mountains. *Bothalia* **14**: 525–532.
- Friis, I. (1986a). The forest vegetation of Ethiopia. *Symbolae Bot. Uppsal.* **26**:311–47.
- Friis, I. (1986b). Ethiopia in regional phytogeography. *Symbolae Bot. Uppsal.* **26**:68–85.
- Friis, I. (1992). Forests and forest trees of northeast tropical Africa - their natural habitats and distribution patterns in Ethiopia, Djibouti and Somalia. *Kew Bull., Add. Ser.* **15**:1–396.
- Friis, I. and Sebsebe Demissew. (2001). Vegetation maps of Ethiopia and Eritrea: a review of existing maps and the requirements to a new one for the Flora of Ethiopia and Eritrea. *Biol. Skr.* **54**:399–439.
- Friis, I., Rasmussen, F.N. and Vollesen, K. (1982). Studies in the flora and vegetation of SW Ethiopia. *Opera Bot.* **63**:1-70.
- Greenway, P.J. (1973). A classification of the vegetation of East Africa. *Kirkia* **9**:1–68.

- Hamer, K.C., Hill, J.K., Lacey, L.A. and Langan, A.M. (1996). Ecological and biogeographical effects of forest disturbance on tropical butterflies of Sumba, Indonesia. *J. Biogeogr.* **24**:67–75.
- Hartmann, I. (2004). “No Tree, No Bee – No Honey, No Money”: The Management of Resources and Marginalisation in Beekeeping Societies of South West Ethiopia. Paper submitted to the Conference: Briding Scales and Epistemologies, Alexandria, March 17–20, 2004.
- Hill, J.K. (1999). Butterfly spatial distribution and habitat requirements in a tropical forest: impacts of selective logging. *J. Appl. Ecol.* **36**:564–572.
- Hill, J.K., Hamer, K.C., Lacey, L.A. and Banham, W.M.T. (1995). Effects of selective logging on tropical forest butterflies on Buru, Indonesia. *J. Appl. Ecol.* **32**:754–760.
- Howard, P.C., Viskanec, P., Davenport, T.R.B., Kigenyi, F.W., Baltzer, M., Dickinson, C.J., Lwanga, J.S., Matthews, R.A. and Balmford, A. (1998). Complementarity and the use of indicator groups for reserve selection in Uganda. *Nature* **394**:472–475.
- Hunter, M.L. (1996). Fundamentals of conservation biology. Blackwell Science, Cambridge, Mass.
- Hurni, H. (1992). African mountains and highland environments: sustainability and susceptibility. **In:** Stone, P.B. (ed.) Status of the world’s mountains. Zed Books, London and New Jersey. pp 11–44.
- Hussein, M.H. (2000). Beekeeping in Africa: I - North, East, North-East and West African countries. *Apiacta* **1**: 32–48.
- IUCN (2002). Red List of threatened species. <[www.redlist.org](http://www.redlist.org)>.
- WWF and IUCN (1994). Centres of plant diversity: A guide and strategy for their conservation. 3 Volumes. IUCN Publications Unit, Cambridge.
- Jansen, P.C.M. (1981). Spices, Condiments and Medicinal Plants in Ethiopia: Their taxonomy and agricultural significance. Agricultural Research Reports 906, pp. 10-20 Center for Agricultural Publishing and Documentation, Wageningen.
- Jirovetz, L., Buchbauer, G., Ngassoum, M.B., and Geissler, M. (2002). Aroma compound analysis of *Piper nigrum* and *Piper guineense* essential oils from Cameroon using solid-phase microextraction–gas chromatography, solid-phase microextraction–gas chromatography–mass spectrometry and olfactometry. *Journal of Chromatography* **976**:265–275.
- Kassahun Embaye (1999). Indigenous bamboos of Ethiopia: a call for attention and action. *Walia* **20**:3–9.
- Kay, R.F., Madden, R.H., Van Schaik, C. and Higdon, D. (1997). Primate species richness is determined by plant productivity: Implications for conservation. *Proc. Natl. Acad. Sci. USA* **94**:13023–13027.

- Kigomo, B.N.(1988). Distribution, cultivation and research status of bamboo in Eastern Africa. *KEFRI Ecological Series* **1**:1–19
- King, C. (1984). Immigrant killers: introduced predators and the conservation of birds in New Zealand. Oxford University Press, Auckland.
- Kumelachew Yeshitela and Tamrat Bekele (2002). Plant community analysis and ecology of Afromontane and transitional rain forest vegetation of southwestern Ethiopia. *SINET: Ethiop. J. Sci.* **25**:155-175.
- Legesse Negash (1995). *Indigenous trees of Ethiopia: Biology, Uses and Propagation Techniques*. SLU Repocentralen, Umeå, Sweden.
- Liese, W. (1985). Bamboos- Biology, silvics, properties, utilization. GTZ, Eschborn.
- Logan W.E.M. (1946). An introduction to forests of central and southern Ethiopia. Imperial Forestry Institute Paper 24: 1-58.
- McNeely, J.A., K.R. Miller, W.V. Reid, R.A. Mittermeier, Werner T.B. (1990). Conserving the world's biological diversity. IUCN, WRI, CI, WWF-US, WB, Gland, and Washington, DC.
- Mittermeier R.A, Werner T.B. (1990). Wealth of plants and animals unites megadiversity countries. *Tropicos* **4**:4–5
- Mittermeier, R.A., Gil, P.R. Hoffman, M., Pilgrim, J., Brooks, T., Mittermeier, C.G., Lamoreux, J., da Fonseca G.A.B. (2005). Hotspots revisited: Earth's biologically richest and most endangered terrestrial ecoregions. Conservation International, Washington
- Moreau, R.E. (1966). *The bird faunas of Africa and its islands*. Academic Press, London.
- Ohrnberger, D. (1999). *The bamboos of the world*. Elsevier, Amsterdam.
- Olivieri, S.T., Harrison, J., and Busby, J.R. (1995). Data and information management and communication. **In:** *Global Biodiversity Assessment*. pp. 607–670, (Heywood, V.H., ed.) UNEP, Cambridge University Press, Cambridge.
- Onderdonk, D.A. and Chapman, C.A. (1999). Coping with forest fragmentation: The Primates of Kibale National Park, Uganda. *Int. J. Primatol.* **21**:587–611.
- Pichi-Sermolli, R.E.G. (1957). Una carta geobotanica dell’Africa Orientale (Eritrea, Ethiopia, Somalia). *Wabbia* **12**:15–132.
- Reusing M. (1998). Monitoring of natural high forests in Ethiopia. Ministry of Agriculture and GTZ, Addis Ababa.
- Schulze, M.D., Seavy, N.E. and Whitacre, D.F. (2000). A comparison of the phyllostomid bat assemblages in undisturbed Neotropical forest and in forest fragments of a slash-and-burn farming mosaic in Peten, Guatemala. *Biotropica* **32**:174–184.
- Sebsebe Demissew (1993). A description of some essential oil bearing plants in Ethiopia and their indigenous uses. *J Ess Oils Res* **5**:465–79.

- Statterfield, A.J., Crosby, A.J., Long, A.J. and Wege, D.C. (1998). Endemic bird areas of the world: priorities for biodiversity conservation. BirdLife International, Cambridge.
- Tadesse Woldemariam Gole (2003). Vegetation Ecology of the Yayu forest in SW Ethiopia: impacts of human use and implications for in situ conservation of wild *Coffea arabica* L. populations. Ecology and Development Series, No. 10. 162 PP.
- Tadesse Woldemariam and Ararsa Regassa (2004). Forest Biodiversity, Management Practices and NTFP production. Non-timber Forest Products Research and Development Project, Mizan Teferi.
- Tadesse Woldemariam Gole, Denich, M., Demel Teketay and Vlek, P.L.G. (2002). Human impacts on *Coffea arabica* genetic pool in Ethiopia and the need for its in situ conservation. pp. 237–247. In *Managing plant genetic diversity* (J. Engels, V. Ramanatha Rao, A. H. D. Brown, and M. Jackson, eds). CAB International/IPGRI.
- Tamrat Bekele (1994). Studies on remnant Afromontane forests on central plateau of Shewa, Ethiopia. Ph.D. Thesis, Uppsala University, Uppsala, Sweden.
- Thiollay, J.M. (1997). Disturbance, selective logging and bird diversity: a Neotropical forest study. *Biodivers. Conserv.* **6**:1155–1173.
- Thiollay, J.M. (1999). Responses of an avian community to rain forest degradation. *Biodivers. Conserv.* **8**:513-534.
- Van Jaarsveld, A.S., Freitag, S., Chown, S.L., Muller, C., Koch, S., Hull, H., Bellamy, C., Krüger, M., Endrödy-Younga, S., Mansell, M.W. and Scholtz, C.H. (1998). Biodiversity assessment and conservation strategies. *Science* **279**:2106–2108.
- Vasconcelos, H.L. (1999). Effects of forest disturbance on the structure of ground-foraging ant communities in central Amazonia. *Biodivers. Conserv.* **8**:407–418.
- Virtucio, F.D. (1990). Pulp yield physico-mechanical properties of six Philippine bamboo species and the implications on optimal harvesting age. Ecosystem Research and Bureau, Philippines.
- Von Breitenbach, F. (1963). The indigenous trees of Ethiopia, 2<sup>nd</sup> ed. Ethiopian Forestry Association, Addis Ababa.
- WCMC (World Conservation Monitoring Centre). (1994). Priorities for Conserving Global Species Richness and Endemism Caldecott, J.O., Jenkins, M.D., Johnson, T. and Groombridge, B. (eds). World Conservation Press, Cambridge.
- White, F. (1978). The Afromontane Region. Pp. 463-513. In *Biogeography of Southern Africa* (M.A. Werger, ed.) Junk, The Hague.
- White, F. (1983). The vegetation of Africa. A descriptive memoir to accompany the UNESCO/AETFAT/UNSO vegetation map of Africa. *Natur. Resour. Res.* **20**:1–356.

- Wiersum, K.F. (2004). Forest gardens as an 'intermediate' land-use system in the nature-culture continuum: Characteristics and future potential. *Agroforestry Systems* 61-62:123-134.
- Wiersum, K.F. (1997). Indigenous exploitation and management of tropical forest resources: an evolutionary continuum in forest-people interactions. *Agriculture, Ecosystems and Environment*. **63**:1-16.
- Wilson, E.O. (1988). *The Diversity of Life*. Harvard University Press, Cambridge.
- Woldemichael Kelecha (1980). The bamboo potential of Ethiopia. Forestry and Wildlife Conservation and Development Authority of Socialist Ethiopia, Addis Ababa.
- Wondyifraw Tefera and Wannakraioj, S. (2004). A micropropagation method for korarima (*Aframomum corrorima* (Braun) Jansen). *Science Asia* **30**:1-7.
- Yalden, D.W. (1983). The extent of highground in Ethiopia compared to the rest of Africa. *SINET: Ethiop. J. Sci.* **6**:35-39.



## **4 The impact of cultural changes on the people of Sheka and their traditional resource management practices: the case of four *kebeles* in Masha Woreda**

**Zewdie Jotte**

### **4.1 Summary**

This is a report on an investigation aimed at understanding the culture of Shakicho people and the impact of the new belief system and investments on their traditional resource management practices. The culture of a group or any society consists of a set of values, beliefs, symbols, history, tradition, norms and artifacts that the group holds in common. Culture consequently forms the foundation in making decision on the use and conservation of natural forests and other resources. It is reflected through the social organizations, belief system, societal and means of subsistence.

Forests, wetlands and rivers and waterfalls are the main natural resources communities manage through their ecological knowledge. Large areas of the forest in Masha may be described as cultural forests. The base for the conservation of these cultural forests is the religious beliefs that impose resource and habitat taboos on forest patches known as *guudo* forests. Taboos and social values also forbid people from cultivating wetlands and clearing forests in the surrounding and at the side of rivers. The Shakichos believe that people who violate these taboos will die or face evil things. They argue that there is a strong relation between the wetlands, rivers and forests in their environment. They believe that wetlands are sources of rivers, and both wetlands and rivers are kept from drying by forests.

Traditional social organization of the Sheka people consists of the King (*Shekitato*), councils (*mikiracho*) and clan leaders (*gepitato*). This social organization has been mainly responsible for the conservation of natural resources. The diminished role of clan leaders in forest and other resources management has increased environmental degradation. Since 2004, cultural forests that the community has been managing through supervision by clan leaders have been fully converted into 'government forest'. The shift of cultural forests towards government ownership could not reduce the increasing deforestation.

Along the ladder of social stratification within the Sheka people, the Manjos are positioned at the lowest levels as untouchable casts. Economic and social marginalization prohibits them from equal market exchange with the other groups. They can not also actively involve in agricultural activity due to the

influence of their earlier means of subsistence, hunting, thus forcing them to resort to selling forest products. Selling firewood, their new way of life has contributed to deforestation in the area.

Selling firewood in general is a phenomenon that has started only in the past few decades. The attitudinal change among people towards selling firewood, the demand for firewood from the market and pressing economic problems on people, especially the marginalized minorities, are the major causes of deforestation related with firewood demand.

The beliefs, values and customs related with *guudo* and *deedo* worship is central to the conservation values religion promotes. However, these traditional beliefs are getting diminished due to the spreading of new religion since the 1990s. This in turn has contributed to large-scale deforestation due to the change in the conception of the people on the traditional resource management. Consequently, large areas of forest were deforested for agriculture, and the practice of selling forest product on the market has increased.

The establishment of the East African Chewaka Uto Tea Plantation, like any other development project, has both negative and positive impacts on the socio-economic situation of the local community and the national economy. Information gathered from the community shows that the investment project could generate employment opportunity and income generation scheme to few of the local people and tax income to the government. However, inability to reconcile the investment input to the development endeavor, to the livelihood of the surrounding community and to environmental and biodiversity conservation concerns has characterized the investment. The plantation expanded into the natural forests without the consent of the local inhabitants, and brought multidimensional consequences on resource management. The investment was not based on the free and informed consent of the indigenous people. Problems associated with the implementation of the investment have changed the culture of the people. The direct deforestation by the investor and employment of people as daily laborers shifted the life style of many dwellers from farming. Economic crises on the local community and violation of cultural taboos (clearing riversides) have shifted the attitude of members of the local community encouraging them to engage in deforestation. It has undervalued native forest management practices, and contributed for the expansion of a new culture of resource use—selling firewood and charcoal.

The people of Sheka have their own traditional ecological knowledge that has sustained the natural resources to present. The changes in their life style, customary values, the belief system and the expansion of investment has brought cultural changes that alter the importance of traditional resource

management practices, exposing the community to various socio-economic problems. Government and nongovernmental organizations in close collaboration have to take immediate and long term measures to enable and ensure resource rights of the local people and reduce environmental degradation in the area.

## **4.2 Background of the study**

### **4.2.1 Problem statement**

Ethiopia is a country currently facing a high deforestation rates and loss of its rich natural resources. Tadesse (2002) stated that about 60% of the forest cover of the highland plateau of SW Ethiopia was lost due to manmade destruction during the last thirty years. It has also been stated (Ruesing 1999) that 9000 km<sup>2</sup> of closed high forests were destroyed between 1973 and 1990 (Daba 2000). Similarly about 50% of natural high forests were found to have been degraded to slightly or heavily disturbed forestlands in the period from 1971 to 1997 (Daba 2000). Teklu and Thomas (2004) reported rapid loss of forest in Yayu and Sheko areas in the SW mainly due to deforestation. According to them, previous attempts to conserve the forests in general and the coffee forests in particular were precarious and did not have significant impact.

Cultural change is widely observed in Sheka Zone of South West Ethiopia. The introduction of new religion and expansion of investment in plantations are intensively affecting the livelihood of the indigenous community through changing their landuse and conservation culture. The introduction of new belief system in Southwest Ethiopia during the 1970s and its wider expansion in the 1990s has an immense influence on the indigenous practices of resource use and environmental management. The new religious beliefs and world outlook was introduced by missionaries. The belief disregarded the traditional indigenous knowledge (TEK) of the local people that had served as a base for decision making on natural resource management. There is a need to understand the impact of the change in the belief system of the community and its link with the expanding forest degradation in order to tackle the problem.

Around 43 investment projects were licensed and are currently operating in Sheka Zone of SNNP Regional State, Southwest Ethiopia. Large areas of natural forests were given to investors without sufficient studies. The expansion of unchecked investment has a profound impact on the livelihood of the indigenous community and the biodiversity situation of the remaining natural forest. It can also endanger the traditional techniques of resource management that have been adapted and maintained for centuries. Previous

experiences in the area have shown that indigenous people have been forced to retreat, along with the last remains of native forests, towards marginal lands as land was reassigned to private investors for different plantations, mainly tea and coffee. The impact of these investments on the culture of the Sheka people that influence traditional forest management practice has not been studied. The present study, therefore, investigated the impacts of investment on the traditional culture of resource management.

The expansion of communication infrastructures including road can also contribute to the diffusion of cultural influences that enhance the changes in landuse practice and the resource use culture of the indigenous community. External cultural influences have a strong effect on youth, who often view cultural traditions as primitive and engage in new resource use activities such as fuelwood selling.

Indigenous peoples around Sheka have utilized the natural resources of their local environments, in an ecologically sustainable manner. However, the impact of the investment and new belief system on their culture and its consequence on the natural forest and other resource conservation and use has not been clearly identified. This report presents research work aimed at addressing this need.

#### 4.2.2 Objectives of the study

The general objective of the study was to explore the culture of Sheka people and how landuse change affects these cultures mainly through the introduction of new religion and investment in Masha *Woreda* of the SNNP Regional State. The study dealt with the impact of cultural change on sustainable natural resource conservation and management in general, and forest in particular. In line with this general objective, the research had the following specific objectives:

- To scrutinize how some indigenous ecological knowledge contribute in forest and other natural resource management, i.e. customary use and conservation practices of forest and non-timber forest products, etc.
- To explore the cultural conception on natural forces, ecological cycles and worldviews of indigenous people in Sheka that are imbedded in ethical and spiritual values linked with sound environmental and forest management. It also dealt with the impact of religion and western culture on resource management.
- To identify changes in socio-cultural features affecting forest degradation. This mainly focused on identifying factors affecting culture, cultural reactions to changes in environment, and on present

and past cultural practices and socio-cultural institutions that are involved in resource conservation.

- To assess the impacts of change in belief system, investment plantations, etc. on the culture of the community in relation to customary forest and other resource management, i.e. explore the strategy of the people to encounter threats to their culture to devise strategies for strengthening or regeneration of culture or practices protecting the forest ecosystem.

#### 4.2.3 Scope and limitations of the study

The study had some limitations resulting from the scarcity of resource. Concentration on a single *woreda*, inability to deal with some dimensions of culture and focusing on only few of the natural resources were some of the limitations. Consequently, the scope of the study was restricted to some resource types, socio-cultural components and geographical areas in order to achieve the objective using the available resources.

The research was focused on understanding the culture of Sheka people and its impact on their traditional resource management practices in four *kebeles* of Masha district. It explored how some indigenous ecological knowledge of Sheka people contributed to natural resource management, mainly forests, wetlands, rivers and waterfalls. A people's culture includes their beliefs (religion), rules of behavior, language, rituals, art, technology, styles of dress, ways of producing and cooking food, and political and economic systems, among others. It also includes symbols, history, tradition, norms, and artifacts that the group holds in common. The present study, however, focused on few of these cultural aspects that were supposed to influence ecological resource management processes through changing traditional resource management.

The research depicts the conception of the community towards resource management, and the impact of traditional social organization and social stratification on NRM. The interrelation of customary and government forest management schemes, and the local community's means of subsistence (livelihood analysis) were the other concern of the study. It also deals with the influence of social organization and social stratification on the indigenous resource management. In general, changes in the life style, customary values, belief systems and the expansion of investment that brought cultural changes and altered the importance of traditional resource management practices were main focus areas.

### 4.3 Methods of the study

#### 4.3.1 The study area and the people

The research site is found at about 670 km from Addis Ababa towards Southwest Ethiopia in Sheka Zone of SNNP Regional State. Sheka Zone shares boundary with Oromiya Regional State in the North, Bench-Maji Zone in the South, Gambella Region in the West and Kafa Zone in the East. The Zone has a projected total population of 181, 657 (50.30 per cent male and 49.70 per cent female) based on the population and housing census projection for 2004 (SZCID, 2004). It is divided into three *woredas* that consist of 56 rural and 7 urban *kebeles*.

The study was conducted in Masha *Woreda*, one of the three *woredas* in Sheka Zone that shares a boundary with Oromiya Region in the North, Gambella in the West, Yeki *Woreda* in the South and Anderacha *Woreda* in the East. The name *Masha* serves one of the three *woredas* in the Zone where the study was conducted. It is also the name of the town, which is the capital of the Zone. Statistical abstract from the district Finance and Economic Development Coordination Office shows that 47,860 (25,806 male and 22,252 female) population inhabit the *woreda*. Out of the total population 10,523 (5,062 male and 5,461 female) live in the town. The *Woreda* has a total population density of 41.5 persons per square km. The four *kebeles* either sharing boundary or serving as investment site to East African Chewaka-Uto tea plantation constitute 14.69 per cent of the district population (SZFEDCO, 1997 E.C).

The research site is located to the north and north east of Masha town in the villages bordering the East African Agribusiness Company's Chwaka Uto Tea Plantation. Four rural *kebeles*, namely *Beto*, *Welo Shoba*, *Keja-Chewaka*, and *Uwa* surround the tea plantation. The *kebeles* are found at about 0–17 km from the town. The research mainly concentrated on *Welo Shoba* and *Beto Kebeles*. Of the four *kebeles*, *Beto* and *Uwa* border the tea plantation. *Keja-Chewka* and *Welo Shoba Kebeles* provided the investment site to the investor. The two *kebeles* were selected as they can address the research objectives or cultural changes affecting resource management related to investment and religious beliefs.

Honey, *enset*, cereals such as maize, barley, *teff*, and beans, peas, and different kinds of spices are the major subsistence crops. Survey conducted in the area revealed that honey, *enset*, livestock, annual crops, sugarcane, liana, chat and *gesho*, cardamom, wild coffee, palm, banana and '*timiz*' in descending order of importance were the major means of subsistence (NTFP 2004). The *kebeles* are endowed with dense natural forest, specifically Uto Forest to the North and Chewaka Forest to the West, both of which were encroached by the East African Chewaka Uto Tea Plantation. The ethnic

composition of Sheka Zone is 34.7% Shakicho, 20.5% Kafficho, 20.5% Amhara, 9.6% Oromo, 5.0% Sheko, 4.8% Bench, and 2% per cent Mezengir. Based on the 1994 Population and Housing Census, the religious affiliation of the district population consists of 52.0% Orthodox Christian, 15.5% Protestant Christian, 0.3% Catholic Christian, 3.9% Islam, 17.8% traditional belief and 0.5% other religion. However, many of the dwellers in the study area agree that there is dramatic increase in the number of the followers of the protestant Christian religion. The four *kebeles* that the study covered, however, were quite different in terms of the ethnic composition and the religious affiliation of the dwellers. The Shakichos constituted over 95 per cent of the *kebeles* population except in Keja and Welo Shoba and Uwa where there were relatively large number of Oromos. Many of the dwellers estimated that over 80% of the *kebeles* populations were followers of the protestant Christian religion due to the fast evangelization conducted during the early 1990s.

#### 4.3.2 Data collection

Various methods were employed to collect reliable information. Participant observation, group discussion, and in-depth interviews were the main instruments used in data collection process. Observations were recorded on the livelihood of the community such as working styles, feeding, clothing, religious places, agricultural duties, marketing issues, communal interactions, cultural forests, wetlands, and rituals (custom, habits, practices), and investment sites. Group discussions were held with members selected through wealth ranking criteria set by two men and women arbitrarily approached from the respective community. Number of beehives one hangs, amount of 'enset' owned and number of livestock population were identified as indicators to categorize people into rich, medium and poor economic class. Ability to reflect the socio-cultural situation of the community was also taken into consideration. Observations made and discussions conducted facilitated the recruitment of informants for in-depth interview. Clan leaders (who were also leaders of traditional beliefs), community elders', *kebele* administrators, traditional herbalists, castes, representatives of investment projects and concerned government officials were interviewed.

Social mapping was conducted focusing on the territorial limits of the community, religious sites, cultural forests, roads, and pathways, homes, rivers, schools, villages, grazing and farm lands. The social maps were drawn to show areas of forest degradation, conflict with investors, etc. that reflect the knowledge and attitudes of local community towards the natural resources. Ecological calendar showing the activities of the local community

throughout the year on socio-cultural phenomenon and agricultural activities were traced.

#### **4.4 Literature review**

##### **4.4.1 Culture: the concept**

Culture is a widely used idea in many of the social science disciplines including anthropology where it is a core concept. There are over 350 anthropological definitions given to culture. An anthropological definition of culture, for the first time in its wide ethnographic sense, was given by Taylor (1871), in his famous book *Primitive Culture*. He defined culture as “complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of a society” (Makhan 1998). Kneller (1965 cited in Gregoire and Lebner 2000) also defined culture as “the total shared way of life of a given people, comprising their modes of thinking, acting, and feeling, which are expressed, for instance, in religion, law, language, art, and custom, as well as in material products, such as houses, clothes, and tools.

Nowadays it is agreed not to define the word culture; but to list key concepts in all definitions of culture. For instance, learned behavior, shared, dynamic, adaptive, patterned and symbolic are key concepts in culture. Thus culture is not biologically inherited, but learned; it cannot be owned by single individual but it is rather shared. It is also dynamic or changes through time. Culture serves as a tool to adapt the physical environment. Culture is patterned or it incorporates the way things are done and people behave. Culture is also symbolic as it attaches meanings to objects.

Though it is difficult to separate the different dimensions of culture, the present research spotlights on the dynamic and adaptive aspects of culture. The dynamic and adaptive aspects of culture enable an understanding of how the traditional culture or resource management practices of Sheka people operate. The adaptive aspect of culture make possible the maintenance of sound resource management. The dynamic aspect of culture enables to understand how the impact of contemporary landuse practice contributes to environmental degradation and the erosion of biological diversity.

Cultures can be resistant or promoter to change on a given context. The variation of ideas, values of a society, discipline and socialization patterns, the life experiences of each individual are the basis for all changes in socio-cultural system (Makhan 1998). Cultural changes, largely, are closely related to and may precede or precipitate social changes that involve changes in the structure of the social relationship. In the narrow sense, cultural change



involves alteration in ideas and beliefs about how things should be done (Makhan 1998).

Cultural changes that occur through the desire of some group might affect the livelihoods of others. Gregoire and Lebner (2000), for instance, indicated that one sex might desire changes that affect the other, as happened in the second half of the 20th century in western cultures. Cultural changes can also be explored through the assessment of traditional ecological knowledge as it is very essential for preserving cultural diversity. Hence, traditional ecological knowledge is a valuable resource for assessing the social and environmental impacts of development projects and environmental change (Johnson 1992).

#### 4.4.2 The role of culture in environmental resource management

The strong relation between culture and environment determine the ecological circumstances. Various versions of cultural ecology analyse the interconnection of human beings with the natural environment. Cultural ecology in a wide sense denotes a concern with the relationship between human culture and the natural environment. Steward emphasized what he called the culture core, *i.e.*, those features of a society most closely associated with subsistence, as an adaptation to specific environmental conditions while, White argued for an evolutionary perspective on culture as a mode of adaptation (cited in Hornborg n.d.).

Marvin Harris (1927–2001) viewed cultural phenomena as a reflection of material rationality. Widespread social practices and beliefs, as Harris asserts, must be compatible with the infrastructures of society and their interaction with the environment. Infrastructure in his context represents the ways in which a society standardizes both the kind and amount of resources needed to maintain the society (Elwell 2001).

Roy Rappaport's (1926–1997) account of cultural ecology is also the other perspective that reflects the human-natural environment relation. He described, for instance, ritual pig slaughter in highland New Guinea as a cybernetic feedback mechanism that maintained ecological equilibrium and cultural stability. Rappaport pioneered a more holistic ecological perspective that sought to address both material and conceptual aspects of human-environmental relations (cited in Hornborg n.d.).

The interaction of human being with the natural environment can also be displayed through traditional ecological knowledge (TEK) which is the other component of culture. Berkes (1999) defines TEK as “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of

living beings (including humans) with one another and their environments”. (Johnson 1992; Folke 2004) considered TEK as a knowledge-practice-belief complex. It is indigenous people’s knowledge with respect to their environment that can be both spiritual and ecological in nature (Tsuji 1996; Folke 2004). Berkes (1999) describes the various interrelated levels within TEK which he terms the knowledge-practice-belief complex: the first includes knowledge essential for survival (species taxonomy, distribution, and life cycles); the second practice focuses on tools and techniques for understanding ecological processes; the third is referred to as the worldview that include religion, belief, and ethics. Hence, TEK is socially differentiated according to socio-economic status, religious and other factors that cannot be generalized without making proper distinctions.

In consequence, it is possible to argue that there is a strong connection between biological and cultural diversity. Biological diversity directly enhances cultural diversity through three possible mechanisms. Million and Edwards (2004) argued that areas with high biodiversity might attract more immigrants, for various reasons, thus promoting cultural diversity through cultural interaction. Appreciating biodiversity in terms of human diversity, Million and Edwards (2004) stated that different culture and people with distinct heritages and experiences perceive and apprehend biodiversity in different ways. The culture of a community influences the environment in many different ways as different culture entail different ways of resource management that can enhance conservation of the environment.

#### 4.4.3 Resource management perspectives

A range of conservation approaches are suggested by different scholars in order to ensure sustainable natural resource management. The Canadian Council of Forest Ministers (1998) indicated that improving the understanding of forest ecological processes, and enhancing peoples capacity to manage forests in a way that will maintain the biological diversity, productivity and resilience of these ecosystems” (Davidson-Hunt and Berkes 2000). Stevenson (1998) indicated that incorporating TK (traditional knowledge) into environmental management should not be treated as just some other category of information to be inserted into, or merged with, western scientific knowledge to further the agenda of environmental managers. Rather, the management philosophy has to give its full meaning, merit and efficacy.

There is a paradigm shift in current resource management practice. The shift is towards integrated ecosystem management. There is a convergence between this new kind of resource management and TEK, opening a new opportunity for dialogue and mutual learning. In the new paradigm of

resource management, traditional knowledge is seen as an arena of dialogue between resource managers and harvesters. Such a dialogue moves forest management paradigms beyond our current view of “timber or parks” and towards one of truly integrated use (Davidson-Hunt and Berkes 2000). The incorporation of TEK into the resource management practice depends on the willingness of governments and scientific community who may not usually give attention to the traditional knowledge.

Community-based resource management, particularly forest management other than other management forms has been widely argued by several authors. There is a growing trend of forests owned and administered by communities, due to the recognition that communities can often be as good if not better managers of forests as governments or companies. This is based on the fact that indigenous communities' tenurial rights serve as an incentive for local communities to protect and utilize forest resources in a more sustainable and equitable way. Indigenous communities now legally own or administer approximately 10% of the global forest estate. However, there are countries where indigenous communities administer the largest portion of forests. In Mexico, for example, communities own 80% of all forest resources (University of British Columbia 2002).

The perception of the local communities and state officials towards forest and other resource conservation is different. There is a particular clash between state concepts of property, which assert the principle of limited and exclusive use and the indigenous concept of territory and landuse, which views land not as property but as 'Mother Earth', subject to several overlapping uses (Michael 1997). With indigenous 'territory' models, land and resources are integrated with cultural conceptions of space and socio-political organization. In countries like Panama, Peru and Ecuador there is considerable independence from state rules. Indigenous institutions and the participatory delimitation and protection of indigenous territories is recognized (Michael 1997).

#### 4.4.4 The impact of religion on resource management

Various research findings reveal that religious beliefs, world-views and ethical conditions greatly contribute to the conservation of natural environment and its biodiversity. Though the reasons behind religious beliefs and rituals differ, they contribute to biological conservation in many parts of the world, both developed and developing. Beliefs can play a positive role in society since strict observance of the rules can bring about the orderly behavior of people. Effective use of these beliefs is a potential benefit for the conservation of the forests, land and wildlife (PLA 1997).

There are various forms of religious or socio-cultural practices that lead to environmental preservation or sound resource management. Singh *et al.* (nd) indicated that the Meete of India, Shinto faith of Japan, Ami tribe of Taiwan possess certain religious beliefs and practices that result in the conservation of nature and its biodiversity. The Ami tribe of Taiwan, for instance, worships various species of trees or sacred plots of land, in the belief that Gods reside in these entities or places (Kato 1993 cited in Singh *et al* (nd)). The use of religion in conservation has different motives behind and the values recognized in nature. Conservation of natural resources or biodiversity through various sacred uses of nature includes maintenance of sacred groves, tree and/or animal worship, and observing taboos on harvesting and hunting of plants and animals in many of the indigenous communities in India (Deb and Malhotra 2001 cited in Singh *et al* (nd)).

Sacred groves are smaller or larger ecosystems, set aside for religious purposes (Gadgil and Vartak 1974 cited in Colding and Folk 1997). Sacred groves are one example of how tradition, religious or socio-cultural practices lead to environmental preservation or sound resource management. Sacred trees are widespread throughout India, Africa, and Europe (Frazer 1922 cited in Colding and Folk 1997). Under current rates of deforestation and species loss, sacred groves are becoming ecologically important preventing the depletion of genetically adapted overall biodiversity in a region (cited in Colding and Folke 1997).

Social taboos are the other components of religious beliefs contributing to resource conservation. Culturally defined taboos may play an increasingly important role for biodiversity conservation on a local and regional level. Taboos are social rules and sanctions deep-rooted in the customary belief systems. Cultural ecologists have revealed the complex ecological adaptations behind taboos (Rappaport 1967; 1968; Harris 1979; Balée 1985 all cited in Colding and Folk 2000). Harris (1971 cited in Colding and Folk 2000) suggested that the taboo on the Indian cattle is ecologically adaptive, in that it increases rather than decreases the capacity of the present Indian system of food production to support human life, through the production of milk, dung, and bullocks. Social taboos are good examples of informal institutions, where norms, rather than governmental juridical laws and rules determine human behavior. In many traditional societies throughout the world, taboos frequently guide human conduct toward the natural environment. Designs for conservation of biological diversity and its sustainable use in developing countries should focus more on informal institutions, like social taboos due to their less cost and voluntary compliance features implicit in the taboo system. In some societies, it is customary to impose taboos on the use of subsistence crops to prevent their being harvested at inappropriate times (Chapman 1985 cited in Colding and

Folke 1997). This shows that taboos are social mechanisms imposed sometimes on temporary bases to control the fluctuation of resource bases. Such taboos could be removed when food resources are plentiful. Taboos that directly manage nature are reportedly found among traditional groups from various parts of the world (Colding and Folke 1997).

Social taboos are being increasingly violated in different parts of the world due to the diffusion of external cultures. This results from the decline in knowledge and reverence for the local and indigenous tradition. The spread of new religion, such as the case of Islam and Christianity in Kenya, also has had a negative impact on the preservation of traditional practices. The intruders' or those who violate traditional belief system that contribute to the conservation of forest refer local knowledge of skills and technology and practice as satanic, primitive, backward and outdated, even up to today, Kabatabaz (nd). Thus, religious belief systems that have been playing an influential role in the conservation of natural resources and its biological diversity, are currently threatened by western cultures.

#### 4.4.5 The impact of investment on the culture and traditional resource management

It is a great challenge to governments of developing countries to reconcile the need for the expansion of development programs through investment with the increasing environmental degradation and the loss of biological diversity. Though forests are the most important economic assets and primary option for many indigenous communities to advance their economic well being, they are losing due to various investment projects in many countries. The joint statement of Indonesian NGOs and the Indigenous Peoples' Alliance (Down to Earth 2002), for instance, shows that the Indonesian Government was caught between the need to protect forest area, on the one hand, and accepting on the other hand further investment in the plantation sector such as for oil palm putting forest area under threat. In this instance, commercial firms and governments developed forestlands without the permission of the original indigenous inhabitants. In few countries like Brazil and Bolivia, private interests illegally encroach on the lands of native peoples. The governments often encourage native peoples to yield to firms, emphasizing the incentives that development will bring. Some of the development projects are not based on the interest of the indigenous community. Nevertheless, government side with rapid economic development over the interests of native peoples. Indigenous communities adjacent to the investment plantations and companies in Ghana, for instance, have suffered human rights abuses including shootings, killings, and arbitrary arrests. The state remained either insensitive or actively supported

the companies (Owusu-Koranteng 2003). The government granted the forestlands to the investors without considering emotional and spiritual relationship rural people have with nature.

Owusu-Koranteng (2003) indicated that the destruction of forest by investment companies in Ghana had contributed to the poverty and worsening living conditions of rural communities. Hence, Central Tibetan Administration (2000) argued that sustainable forest management depends on the holders of traditional knowledge having secure land tenure and use rights, the ability to practice traditional resource use systems and decision-making power over resource use. These imply the significance of the autonomy of local people to exercise their ecological resource management practices that is free from the impact of government policy impositions that promote uncontrolled investments.

#### **4.5 The distribution and management of natural resources**

Community mapping carried out and information gathered through different mechanisms including field observation agrees on the fact that the Shakichos divide their environment into different major resource management areas. These include forest, wetland, farm and grazing areas. The livelihoods of the community are strongly attached with these environments that provide different means of subsistence.

##### **4.5.1 Natural resource distribution of Welo Shoba and Beto *Kebeles***

Masha *Woreda* is one of the areas endowed with rich natural resource in Southwest Ethiopia. Community map drawn in two of the *kebeles* in the research site verify the existence of rich natural resources that comprise forest/NTFP, wetlands, grazing and farm areas. The natural forest in the area is source of medicinal plants, construction materials useful for making house furniture, *etc.* (See the community map of the two *kebeles*, Figures 4.1 and 4.2).

##### **Welo Shoba *Kebele***

Welo Shoba *Kebele* is found to the North West of Masha town. The main road from Masha to Gore dissects the *kebele* into two parts leaving three of the nine 'gots' to the North. It shares a boundary with Masha town and Beto *Kebele* in the East, Baro River in the North, Keja and Degele *Kebeles* in the West, Gembeka *Kebele* in the South West and Ateso *Kebele* in the South East. The nine 'gots' in the *kebele* include Betesi, Tachignaw Fetefa, Layignaw Fetefa, Wundebechi, Shashi Shomeka, Cheega, Shoba Mirisha, Keja Fa'isi, and Bekara Belina.



there are about 118 hectares of cultural forests only in Welo Shoba *Kebele*. Cultural forests in the study area are listed below:

**Table4.1 Distribution of cultural forests in Beto and Welo Shoba *Kebeles*.**

S/N	Name of cultural forest	<i>Kebele</i>	'Got'
1	Guudi	Welo	Chega
2	Dapeduki	"	Laygnaw Fetefa and Ateso Border
3	Andebeshi	"	Chega
4	Fetafochi	"	Layignaw Fetefa
5	Fonnochi	"	Keja Foni
6	Wuco	"	Shoba Beresha
7	Belitato	"	Belina Bekara
8	Chega	"	Chega
9	Yarekira	Beto	Between Yarekira and Mechisa
10	Mechisa	Beto	Separates Kibbi and Geecha from Mechisa

Source: Community Map

The northern section of the *kebele* is covered with dense natural forest that provides their major means of subsistence through enabling the production of honey, hunting, collecting spices, and other NTFPs. The forestland is divided into *Sato* and *Uto* forests that cover large portion of the study *kebeles*. *Uto* is found to the west which is under the large scale deforestation of the uncontrolled East African Chewaka *Uto* Tea Plantation while the *Sato* forest constitutes the eastern part of big forest (*Kobbo*) sharing boundary with the Baro River in the north which separates the study *woreda* and Oromiya Regional State.

Gagani, Yayibuni and Oji are rivers draining to the north of the *kebele*, which are among the major tributaries of Baro River. Afali River starts from the bottom of Masha town and drains to Oji River. Wennani is a relatively big river draining to the Baro River crossing the *kebele* from east to west. Fonni River drains towards Gembeka *Kebele* contributing to the tributaries of Baro Rivers. Rivers Fonni, Oji and Gagani form medium waterfalls on their way to Baro River that are covered with forest. (See the community map above). Informants described that it is a taboo to clear forests at the side of waterfalls and rivers.

Wetlands are usually surrounded by the natural forest and serve as the origin of many rivers and small streams. *Sato* and *Kefi* are wetlands found in the big forest that cover the northern part of the *kebele*. Oji, Billo, Mekara, Yoki, Bekara and Shutemesi are wetlands found in Welo Shoba *Kebele*. Oji and Shutemesi wetlands, for instance, are wetlands surrounded by She'e



Goda and Dapeduki forests. (See Table 4.2 that gives list of wetlands in the study *kebeles*.)

**Table 4.2 Distribution of Wetlands in Beto and Welo Shoba Kebeles**

S/N	Name of the wetland	Kebele	'Got'
1	Oji	Welo	Chega got
2	Billo	"	Chega and Shoba Shimeka
3	Mekara	"	Shoba Beresha
4	Yoki	"	Shoba Beresha, Keja Foni Tachignaw Fetefa
5	Shutemesi	"	Tachignaw Fetefa and Dapeduki
6	Bekara	"	Bekara and Gembeka Kebele
7	Shato	Beto	Kobbo
8	Kefi	Beto	Sato

Source: Community Map of Beto Kebele.

### **Beto Kebele**

Beto Kebele is found to the north east of Masha Woreda. It shares a boundary with Masha town in the south, Abelo and Yapho Kebeles in the East, Welo Shoba Kebele in the west and Baro River in the north. The *kebele* is divided into four 'gots', which is the lowest formal administrative structure under the current government. The *kebele* has a total area of 3,853 hectares comprising different resource management zones. Out of the total area, 1,860 hectares (48.27%) is covered with natural forest. Land covered with crop, used for grazing and utilized for other purposes account for 423 (10.97%), 186 (4.83%) and 1384 (35.92%) hectares, respectively. Forest, wetland, grazing land, farmland and non-timber forest products are the major landuse patterns found in the *kebele*. There are two strips of cultural forests stretched parallel to each other at closer distance in the east west direction. Yarekira is one of the two cultural forests that separates Yarekira and Mechisa 'gots' while Mechisa cultural forest separates Mechisa 'got' from Geecha and Kibbi 'gots'. Worship places (*guudos*) existing in the middle of these two cultural forests serve as a base for the beliefs and taboos imposed on the cultural forests.

Ani Hora is a wide wetland that is found in the north part of the *kebele* in the large forest area, 'Kobbo'. The Sato natural forest constitutes the larger portion of the *kebeles* geographical area that provides the chief means of subsistence to the community. The portion of forest that is found north of the *kebele* has no clear boundary that identifies whether it is demarcated under Beto or Welo Shoba Kebele. Each *kebele* claims the part of forest at its side of the street as their own. This is mainly because people come from other

*kebeles* in the *Woreda* other than the two *kebeles* who have *kobbo* from this area. It is a forest highly contributing for the production of honey, constituting their main means of subsistence. Production of spices, other NTFP as well as hunting in this forest augment their livelihood.

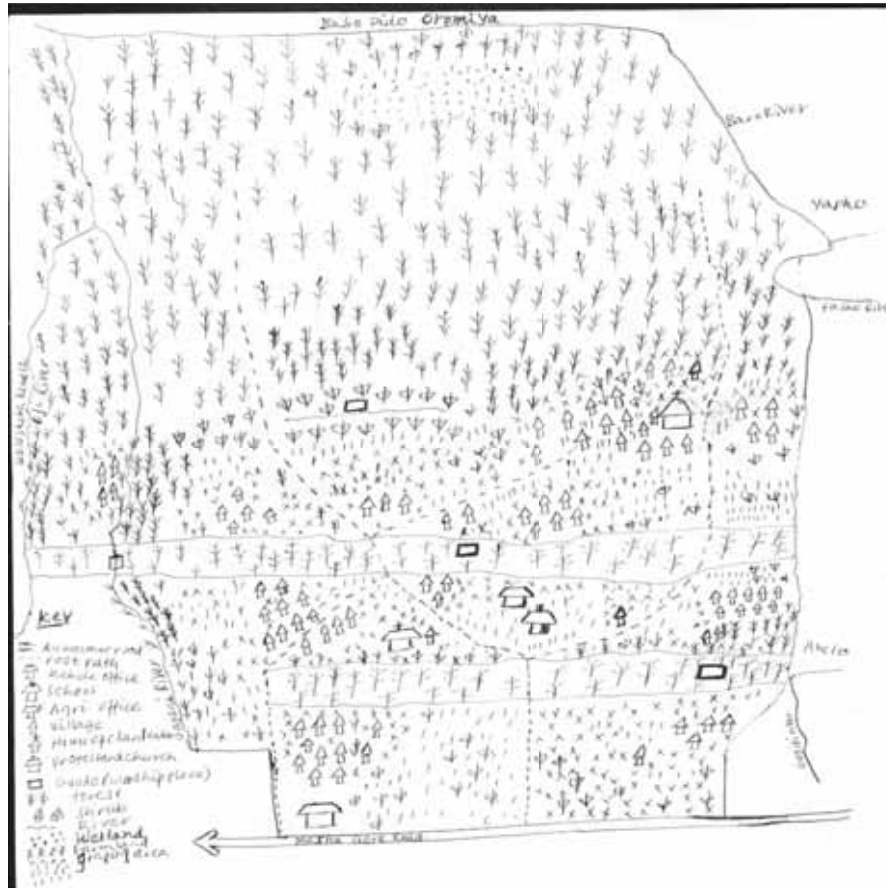


Figure 4.2 Community map of Beto Kebele as drawn by the community

The big forestland (Uto and Sato) in the Northern part of the two *kebeles* provides, construction materials, house furniture and agricultural tools. Hence, the livelihood of the community is strongly attached to this forest.

## 4.6 Traditional resource management practices of Sheka people

Resource management practices of Sheka people is based on their traditional ecological knowledge that is highly influenced by their social organization, religious conception and worldviews. The Shakichos classify the natural environment into different types of management zones, having strong interrelation to one another that allows maintaining environmental stability. Their social organization makes possible to manage the different categories of the environment. It provides different responsibilities of resource management to the people along their traditional layers starting from the king (*Shekitato*) down to individuals and groups at grass-root level. Clan leaders (*gepitato*) are administrators as well as ritual leaders as they allocate land to the new comers and "purify" the people (Mengistu Seyoum 1995:29).

### 4.6.1 Conception and beliefs of the community towards resource management

#### I. Forest:

Forestlands in the study area are divided into cultural forests and large forest areas that are administered through the *kobbo* customary right. Cultural forests and large forest areas administered through *kobbo* differ in two major ways. Firstly, cultural forests are found around villages and on hilly or mountainous areas while large forest areas are found relatively far from people's settlements (towards Baro River). Secondly, the attitude, conception and belief of the local community towards the two types of forests are very different. The management of cultural forests is based on the resource and habitat taboos. The management of large forests (*kobbo*) is based on the rights and obligations of the individual who inherited the forestland from his ancestors.

#### A. Large forest area (*kobbo*):

The management of *kobbo* is based on customary rules that identify the rights and obligations of the individuals who have their own forestland (*kobbo*). Hence, *kobbo* is a portion of one's own inherited 'forestland' mainly used for harvesting honey and other NTFP. The owner has customary right to hang beehives for honey production and to collect different types of NTFP. The owner can also use timbers from his *kobbo* for making traditional beehives. People interviewed during the study described that only owners can extract wild coffee, house furniture, agricultural tools, non-timber construction materials including different types of climbers and spices such as '*Kororima*', '*Timiz*', etc, for their own consumption and market sale.

The holder of the forest who is allotted or has inherited a block is responsible for its management through traditionally known use and conservation rights. Many of the informants agree that other people are not allowed to use resources in *kobbo* for hanging beehive and extraction of other NTFPs unless it is beyond the knowledge of the owner of a particular *kobbo*. Clan leaders enforce the customary rules of forest management, though to a less extent nowadays.

Traditionally, clan leaders control the holder of *kobbo* who is responsible for illegal timber extraction and other damages brought within his boundary. The clan leader has the right to impose different forms of punishments on the illegal use of forest resources. Currently, both the government and the owners control forest and NTFPs in *kobbo* area. Clan leaders still provide informal advices for promoting conservation of resources in *kobbo* area.

Selective hunting is also conducted in this part of the forest. Many of the informants indicated that the number of wild animals they would see on their way to *kobbo* for honey production and other activities has been amazingly reduced in the past few decades.

#### **B. Cultural forests:**

It is evident from the community maps sketched in the two *kebeles* (*Beto* and *Welo Shoba*) that cultural forests are found at mountainous areas, at the sides of rivers, waterfalls and wetlands. The base for the conservation of these forests is taboos related with religious beliefs and societal values that coincide with their ecological knowledge varying from place to place. Strict observance of beliefs can play a positive role through bringing about the orderly behavior of people, which help in the conservation of the forests, land and wildlife (PLA 1997).

There are ten cultural forest areas in *Beto* and *Welo Shoba Kebeles*. Worship place in the middle of the cultural forests (*guudo*) is central to the resource and habitat taboos enhancing cultural forest conservation. *guudo* is a worship place inside the cultural forests where religious ceremonies, sacraments and prayers are conducted. The *guudos* are mostly found at the middle of cultural forests. The sites are unknown to most people, except for the clan leaders who provide sacraments and conduct prayers. *Guudos* are specifically situated in areas relatively elevated, around big stones and trees at the middle of cultural forests. Only few people know where the worship place at the middle of cultural forest is specifically situated. Informants and field guides were not eager to exactly locate such sites as they believe that it might cause a hazard on them. People who enter *guudo* should not be impure. Women during their menstruation, a person who has touched coffin before few days, people with some parasitic disease and anyone who may have eaten cabbage cannot enter *guudo*. The provision of sacrament is currently not practiced

due to socio-cultural changes weakening traditional beliefs. The Shakichos interpret the belief in *guudo* with biblical histories of Moses and Abraham's prayer and sacraments described in the Old Testament on a mountain where they trace their origin.

Every forest where there is *guudo* site is forbidden from cutting. People do not even point at it showing their respect for the spirit that dwells in the area and to avoid getting inflicted by evils associated with violation of the *guudos* rule. It is prohibited to clear such cultural forest areas or to cut trees for house construction and house furniture. Though few people have recently started to violate the rule, hanging beehive, hunting and cutting climber is a taboo that every member of the community in general observes. There is also a conception among the community that as protection of the cultural forests ensures normal rainfall distribution; *guudo*<sup>1</sup> should not be exposed to deforestation. The protection of cultural forest also protects wild animals as hunting in such forest is forbidden. The prohibition of hanging beehive (that has been violated in the past few decades), was to give shelter for bee colonies expelled from their hive in *kobbo* during honey harvest times in May.

Resource and habitat taboos imposed on areas of cultural forest have significant ecological importance particularly to the conservation of forest and other resources conservation. They help prevent genetic erosion of plant and animal species and protect wild animals and bee colonies. The surrounding community believe that people who violate the taboos will die or face evil things. The belief by the community that clearing *guudo* for cultivation brings drought, heavy rain and other forms of catastrophes protects the forests.

## II. Wetlands (*Ceco*):

In many of the areas, forests surround wetlands. Oji, Billo, Mekara, Yoki, Shutemesi, Shato, Bekara, Kefi and Ani Hora are some of the wetlands found in Beto and Welo Shoba *Kebeles*. The wetlands, as elder informants indicated, are the source for many of the tributaries of Baro River. A taboo forbids cultivating the wetlands and the forest in its surrounding. For instance a wetland in Beto area in a place called Warwaro was tabooed from cultivation. There is a story told by the inhabitants that, in the past, a pair of oxen sunk with farm tools in the wetland in Beto as the farmer attempted to farm the area. Such stories strengthen the respect of the local people towards taboos.

---

<sup>1</sup> The term *guudo* is used interchangeably to mean both the worship place at the centre of the cultural forest and the whole cultural forest in a particular area.

Wetlands were under the management of clan leaders until the coming of the *Dreg* Regime. Clan leaders used to organize and conduct worship ceremonies and provide sacrament in the area. Prayer and sacrifice was conducted through the guide of clan leaders. A clan leader has to be "pure" by keeping himself from any "impure activities" for few days before the provision of sacrament sometimes without wearing cloth. No one is supposed to reach this place except the clan leader. The religious celebration involves blessing, praying for rain, for productivity, health and peace of the people, crop and cattle. They also slaughter cattle and prepare local beer for the occasion. Many of the informants indicted that the religious ceremony conducted in this area prevent diseases that usually occur from May to June. They stated that of late, the diseases became more frequent as celebrations and sacrifices are minimised upon the introduction of new religion, *i.e.*, Protestant Christianity. Likewise, people say that cattle death is on the rise due to the violation of taboos such as cutting the surrounding forest and failure to conduct rituals and celebrations.

### III. Rivers and waterfalls:

Traditional beliefs also protect forests on river banks and around waterfalls. If a person cuts such trees, there is a belief that he may die, for he is against the rule of the guardian spirit for which sacrament is provided by clan leaders in wetland areas and waterfall points. Taboos on the forests at the side of rivers are based on the assumption that rivers need cover (*acheiedo*), as people require cloth in the views of the Shekichos. The forest is also important for the continued existence of rivers without drying and the supply of cold and clear waters for drinking and other purposes. Informants clearly state that the natural forest at the sides of rivers, waterfalls and wetlands are the base for their rivers. They argue that there is a strong relation between the wetlands, rivers and forests in the area. Wetland is a source of rivers; and forests keep wetlands from drying. Research findings also confirm their traditional ecological knowledge that wetlands are important contributors to groundwater and hence to the maintenance of water supply (Yilma and Geheb 2003).

#### 4.6.2 Social organization of Sheka people

Social organization of the community plays a central role in the management of natural resources including forest. Social organization is the systematic ordering of social relations by acts of choice and decision which is guided by priority or superiority made available by the social structure (Makhan 1998). Although it has been influenced in the past few decades, the Shakichos have their own long lasted social organization that have a bearing on natural resource management. Traditional social structures form the base of the

systematic ordering of social relation in resource management. At the top of the social organization of the Shakichos, there is a king (*Shekitato*). Under the king, there are councilors (*mikiracho*), clan leaders (*gepitato*) and individuals appointed under them. The social organization maintains the systematic relation among members guarding against social disorder that may exacerbate environmental degradation.

The king (*Shekitato*) calls an assembly once in a year usually on 26<sup>th</sup> of September. This type of assembly was conducted in 2000 for the last time. On the assembly, the king provides titles for socially accepted and knowledgeable people who are supposed to own special capability to resolve conflict and to keep peace in the village. Next to the king are seven councilors (*Mikiracho*). The seven members of the council include *katarasha*, *welasha*, *akakerasha*, *farasha*, *gesherasha*, *shisherasha* and *chiterasha*. The seven councilors have the right to dismiss the king. Each councilor administers all the land under his respective territory. During the imperial period, the land of a particular *mickiiracho* was directly responsible to the feudal lord for the collection of tax and for contributing members to the army (Mengistu Seyoum 1995). Under the councilor, there are a number of clan leaders (*gepitatos*) who are responsible for administrative activities. Clan leaders give titles for the individuals they appoint under them. The titles they give include: *weltata*, *abeltata*, *arettata*, *shibitata*, *yaphitata*, *betata*, *degitano*, *akitano*, and *yewitano*.

Informants described that the clans are divided into two major groups (moieties) named *Berado* and *Akako*. The splits into two is to avoid endogamous marriage and to broaden marriage options (Mengistu Seyoum 1995). Accordingly, clans North of the Ganji River come to be known as *Akakos* and those South of it *Barados*. Moieties conduct exogamous marriage.

**Clan Leaders (*gepitato*):** The position of a clan leader among the *Shakichos* is the most influential traditional position that an individual acquires through inheritance. The individual who gets appointed to the position of clan leader slaughters a bull on the occasion. If the bull he slaughters on the occasion does not moan, he will not be appointed or the people will not accept his rule.

Clan leaders assume a range of responsibilities that have serious concern with socio-cultural, religious and economic affairs. They are both ritual leaders and administrators responsible for the arbitration of dispute among clan members. Until the end of the imperial period, informants indicated that clan leaders controlled the whole aspect of people living in their territory, usually land equivalent to the size of the present *kebele* administration. Informants described that during the imperial period the government did not

appoint their own political leaders at local level. Rather, the imperial government preferred the clan leaders to administer the area. During this period, clan leaders used to allocate land to the new comers and “purify” the land and its people from misfortunes (Mengistu Seyoum 1995). The clan leaders in each area administered various natural resources that include forest, wetland, river water, and religious places, together with individuals they appoint.

Although the position of *gepitato* has survived upto now, most of its administrative duties have been taken away. After incorporation into the Ethiopian empire, particularly after the establishment of peasant association in 1974 and sub-associations under them, clan leaders are left only with their ritual duties (Mengistu Seyoum 1995). With the coming of the *Derg* government to power, the other duties of clan leaders was passed to *kebele* administrators who were elected by the politicians. Informants described that the *Derg* did not allow clan leaders to perform their traditional role due to its anti religious policy and the consideration that clan leaders are supporters of the preceding feudal regime. Following the downfall of the *Derg* regime, however, the *gepitatos* started to play their traditional role including ritual leadership. Traditional responsibilities performed by the *gepitatos* include the following:

- Perform and lead various religious ceremonies and rituals. Provide blessing to their land and pray for the peace of their people, cattle and crop;
- Informally administer natural resources such as cultural forests and wetlands;
- Play a primary role in customary dispute resolution; and
- Impose and enforce punishments to the violation of traditional rules related to resource management and celebration of religious ceremonies. The punishments usually involve fines in kind, advices, ostracism, *etc.* *Gepitatos* identify offenders through swearing and cursing. Fire, egg, water and ash are materials used in the swearing process while spear is commonly used in the cursing process.

Thus, clan leaders have been performing different social, cultural (religious) and economic activities that are substantially related with resource management and the livelihood of the community.

#### 4.6.3 Social stratification of Sheka people

There are four casts among the *Shakicho* people. It incorporates the Shakicho proper, black smiths, potters and the Menjos. The Shakichos are at the highest cast and the rest are found at descending rank with the Menjos at



the bottom of the ladder. The low cast groups acquired their status due to their work habit. The Menjos who hunt are the most marginalized casts in terms of social, economic and cultural aspects. As a result, most of them depend on selling forest products, mainly charcoal and firewood. There are about 60 households in the two Beto and Welo Shoba *Kebeles* who sell fuelwood and charcoal to the market. The unequal access of this caste group to basic resources is contributing to the deforestation.

The Manjos have their own mythological explanation for their status. 'Eight brothers were coming from Jerusalem. On their way, they were all starved, and one of them, Manjo, separated from his seven brothers, went hunting and ate 'unmerited diets' like Colobus monkey, porcupine 'rock hyrax, worm, and dead animals (which they still practice). When Manjo came back to join his brothers, he had a bad mouth, which killed one of his brothers. Consequently, Manjo and his descendants remained isolated due to food habit'. Eating such animals is tabooed by the majority Shakichos to date.

The Manjos lived and hunted in the forest during the imperial regime. The *Derg* government had tried to integrate them with the rest of the society. They started selling fuelwood during the *Derg* villegaization program for people who settled at the main roadside. The Manjos started to sell fuelwood as a means of subsistence as they could not easily adapt to the farming which they were introduced to during villegaization. People consider Manjos workshy as they spend their time hunting Colobus monkey during agricultural season, eating meat and drinking '*tej*' in town during honey harvest season. In consequence, they are considered as extravagant. However, this needs to be considered in terms of the influence of their earlier hunting way of life which was disrupted by the *Derg* government.

Thus, government activities and projects that were based on insufficient study had contributed to large-scale deforestation related with the cultural change such as the Manjos shifted way of life. Some studies show that a forced shift of means of subsistence among indigenous communities result in cultural and environmental degradation. Jackson (2004) described that the loss of Pygmy communities' customary forestlands and access to forest resources and reliance on farming to meet basic subsistence needs was contributing to erosion of their traditional knowledge and cultural practices, particularly among the youth. Similarly, the Manjos have currently started to involve in agricultural activities through the advice of the rural development office, though this may not stop their activities that contribute to forest deforestation.

The Manjos did not get equal access to education, land and other government supplies. Many of them have very small or no *kobbo*. Little improvement was observed on this during the *Derg* period. Majority of the

rest of the groups do not buy their products such as ‘*enset*’, cattle and grain in the local market, except honey, hens and few other products. Their children were not equally eligible to school with others. The Manjos who participated on labor cooperation (*defo*) were served food and drink on an *enset* leaf, out side the host’s house (Mengistu Seyoum 2001). They are also considered as lazy farmers. The social and economic marginalization imposed on Manjos forced them to depend on selling fuelwood and charcoal as a means of subsistence since the *Derg* regime. Coupled with change in the belief system and other factors, marginalization of this lower cast has contributed to the deforestation of a large size of cultural forests, mainly Fonnochi and Guudi (Figure 4.3).



**Figure 4.3 Formerly tabooed trees cut down for selling as fuelwood from Fonnochi cultural forest**

The Manjos shift their house every one to five years due to land shortage and their work habit. Most of them change their house within a year. They always settle around forest areas, whose products they sell to the market until they leave when the resource is depleted. Dependence of the Manjos on selling firewood, in general, has been due to their shifted way of life during the *Derg* villegization, lack of sufficient land, economic and social marginalization that prohibit their market exchange and their inability to actively involve in agricultural activity due to the influence of their earlier means of subsistence, hunting.

#### 4.6.4 The interrelation of customary and state forest management

Both customary and government forest management were previously in the hands of clan leaders. During early days, the clan leaders had the right to enforce compliance to taboos and restrictions related to the cultural forest. Clan leaders also imposed punishments on people involved in deforestation. The punishments were usually paying black ox, goat or other livestock. When the offender does not comply with the rule or does not accept the punishment, he would be socially ostracized.

Deforestation has aggravated since 1999. Currently, even the *Shakicho* proper have started selling fuelwood. People have begun to clear cultural forests on the hill to plant spices and other crops to claim the land as their own during the recent rural land measurement for certification. Others sell such land with planted spice to other people, mainly from cities.

Informants in Beto area indicated that the land measurements conducted in 1997 and 2004 had aggravated the deforestation of cultural forests. The 1997 land measurement included only the shrubland, unlike the 2004 measurement that was based on the farmers' description of their own holdings. Officials from the rural development desk indicated that the 2004 land measurement was conducted for taxation purpose. People who participated in group discussion in Beto area, however, stated that many of the farmers added two to four hectares beyond their real holding, as there were no ropes or measuring tools stretched.

Thus, in the hurry to claim more land, farmers cleared cultural forests adjacent to their farmland aggravating deforestation. Since October 2004 cultural forests that the community has been managing through the supervision of clan leaders have been fully converted into 'state forest' (e.g., Figure 4.4).

The SNNPRS Rural Land Administration and Use Proclamation No. 53/2003 and its Implementation Rule No. 16/96 did not fully recognize the local people's customary right that sustained the forest and other natural resources for the past many years. It stated that every land except farmlands in the region is state forest, with very little emphasis on the customary forest management. In consequence, *Kobo* land is also being taken and given to investors without the consent of the *Kobo* owner.

Informants agreed on the idea that deforestation of the cultural and other forests around settlements has been aggravated after the shift of ownership to the government. The original holders of the forest could not stop illegal extraction, as their ownership has been taken. On the contrary, few informants indicated that the *kebele* administrators and the police make the necessary follow-up on people involved in illegal timber extraction.

However, the *woreda* court does not always take necessary and timely action on offenders.



**Figure 4.4** A Cultural forest currently declared as state forest

In cases of disputes between investors and members of the local community on Kobo natural forest, the *kebele* social court usually passes decision in favour of investors rejecting the customary right of the owners. Hence, the absence of clear forest policy that considers the customary right of the local community, and the tendency of government authorities to favor investors at the cost of the life of the community that depends on the natural forest, has aggravated deforestation. However, it does not mean that the customary management of the cultural forest is quite effective under currently weakening traditional management practices. Rather, the combination of various stakeholders that adequately incorporate the local community input, recognize their customary right and knowledge needs to be organized before converting *Kobo* forests into ‘state forests’. The absence of such arrangements aggravate deforestation for market-oriented extraction of forest products.

#### **4.7 Means of subsistence (livelihood analysis)**

The influence of the community on the natural resource management is displayed through their interaction with the environment that can be clear from an analysis of their livelihood. The means of subsistence of the community in Beto and Welo Shoba area is based on agricultural production.

The community earns their livelihood from growing different types of annual and perennial crops, livestock production, extraction of forest and NTFP, including extraction of medicinal plants, hunting and selling various items to towns. Selling fuelwood is also becoming a means of subsistence within the past few years. Hence, analyses of the Shakichos livelihood or means of subsistence indicate how current changes in their ecological resource management contributes to environmental degradation. The analysis focuses on the means of subsistence related with forest products.

#### 4.7.1 Agricultural production

‘Enset’, maize, beans, pea, barley, wheat and ‘teff’ are crops commonly grown in the area. The Shakichos plant ‘enset’ in their garden next to their home as they know that it retains moisture in their garden, provides beauty to their homestead and protects from wind.

The Shakichos production and consumption of basic necessities including shelter and other items had been in the past ecologically and environmentally sound. Informants, however, indicated that environmentally unfriendly situation has been developing with the wide expansion of ‘teff’ cultivation. The Shakichos used to eat only ‘*qoco*’ (food made of ‘enset’) in the past; ‘teff’ production was widely started during the imperial period and has been increasingly used as food since the Derg regime (Beto). The Shakichos recognize that ‘teff’ dehydrates the moisture of the areas and highly depletes soil fertility within few years. The expansion of ‘teff’ cultivation and the increase in population has aggravated clearing natural forest, mainly cultural forests around settlement sites. Teff is not ecologically sound as ‘enset’ that retains moisture and enables household food self-sufficiency from small plots of land. ‘enset’ and ‘*godere*’ are crops widely grown which enable them to cope up in times of famine and drought due to their drought resistant behavior.

#### 4.7.2 House furniture and construction materials

Some of the house materials used that are made from plants naturally grown in their surrounding include: ‘Cego’, ‘urengo’, ‘yeho’, ‘nechato’, ‘shesharo’, and ‘diido’. There is no significant change in adopting modern house furniture that contributes to environmental degradation. The majority of house furniture in their homes and gardens are made of non-timber forest products (Figure 4.5).

*Shoro* made of ‘*dikulas*’ hide, ‘*gicho*’ (*fuso*) made of ‘enset’ leaves, and *wojjo* cloths made of animal skin and leaves, (mainly ‘enset’ leaves), are

some of the traditionally dressed cloths among the Shakichos. Many of the informants described that modern clothes that can be accessed through market exchange are gradually replacing traditional cloths especially since 1974. The replacement of traditionally made cloths with expensive imported items would require selling forest products such as firewood and climbers.



**Figure 4.5** Common types of trees planted for fence in Beto area

**Livestock production** is the other means of subsistence among Shakichos. Rearing of cattle, sheep, goats and pack animals, primarily horse, donkeys and mules is widely practiced. Some of the grazing areas in forests around the villages are open access to all people who have cattle. Individual farmers usually let their livestock to the field, which does not require shepherding except for occasional supervision. Livestock can stay in the field for a long time without having to keep them in houses or barns except for cows that are milked. There appears to be sharing of habitats between wild animals and livestock in the forest, except with hyenas, which are immediately hunted once seen in the area. It also shows strong mutual trust among the community, and the existence of very strong traditional social organization and control mechanism that enforce compliance to these rules. The ecological knowledge and rules of the community ensures that the size of the livestock population does not put pressure on the open access grazing land. Richards (1997) argued that co-ownership or control does not necessarily imply communal extraction unlike Hardin's theory which advocates that resources held in common are doomed to over-exploitation since resource-users are individualistic.

However, a few informants argued that livestock population is increasing in recent days due to changing attitude and value of people favoring to keep more livestock particularly milk cows, putting pressure on the open access grazing resource and increasing their own economic return.

#### 4.7.3 Dependence on forest products:

The livelihood of the Shakicho largely depends on timber and non-timber forest products. Many of the informants stated the importance of the forest for their livelihood by declaring that it is every thing for them. Some equate the forest to a “pension card” passed to them from their parents,

A range of values are attached to the forest and non-timber forest products that have socio-economic importance. Honey, wild coffee, climbers and spices are the chief NTFPs they acquire from forest. Honey is the main NTFP that is harvested in May. In some areas, production of honey contributes to the primary income of the family more than ‘*enset*’. Previous PRA assessment conducted in one of the study *kebeles* (*Beto*) shows that honey production is the primary economic activity that contributes to about 27 per cent of their livelihood sources followed by ‘*enset*’ and livestock production that constitute 18 and 14 per cent, respectively (NTFP 2004). Informants in Keja area indicated that people extract wild coffee and spices for their own consumption and sell the rest to the market. It was also stated by informants that there were very few people who planted coffee and spices in the forest. The forest provides climbers and other non-timber construction materials and agricultural tools. The use of large trees is observed only for making traditional beehives (See Figure 4.6).



**Figure 4.6 Trees hacked for making traditional beehives**

Individual families hang about 50 traditional beehives per year, which can be used for not more than four consecutive years. Although honey is a non-timber forest product, the use of timber trees for making beehive is an activity that encourages deforestation.

**4.7.3.1 Medicinal plants**

The natural forest in *Sheka* area is endowed with medicinal plant species to cure different diseases. The society uses many medicinal plants both from the main natural forest near the *Baro* forest (*kobbo*), and from the cultural forest near the villages and sometimes from shrubs in the grazing lands. Some of the medicinal plants and the disease for which they are used as listed by informants are shown in (Table 4.3).

**Table 4.3 Medicinal plant and diseases it cures**

S/N	Local Name of the Plant	Part of the plant used	Type of disease it cures
1	Gujimato	Leaf	Ascaries
2	Damo	Leaf	Mich
3	Gargi'o	Leaf	Ameba
4	Umo	Bark	Drying Sore
5	Imano	Leaf	"
6	Caqo	Root	"
7	Qakero	Root	Syphilis
8	Endod	Root	"
9	Gigi'o	Leaf	Diharria
10	Shollo	leaf	Dehydration
11	Gatto	Bark	"

Source: Focus Group Discussion in Beto and Welo Shoba *Kebeles*

Informants indicated that the number of people using traditional medicine is decreasing due to the expansion of new religion (the belief in Jesus as the only savior from any disease) and also due to the large amount of fee the herbalists request. Coupled with the increased movement of people during the road construction in 1984 and, the number of people dying of different diseases had dramatically increased. People used to go to very far places to participate in burial ceremonies. Informants in Beto area explained that they went as far as *Anderacha Woreda* to participate on burial ceremony of individuals they did not exactly know, but accompanying individuals they knew. Currently, they say they are busy with burial ceremonies within their own *kebeles* unlike before three decades ago. Nevertheless, the decrease in the use of traditional medicine may not solely account the increased death.



Increase in population and interaction with external community that enhance the spread of different diseases might also aggravate the situation.

#### 4.7.3.2 *Selling forest products:*

Lianas, fuelwood and charcoal are some of the forest products that are sold in the community. Many informants do not remember when people started to sell lianas in the market as it scored many decades. However, they can exactly trace when people started to sell other forest products particularly fuelwood in different phases.

Ten years ago, cutting trees was considered like harming people. Because their livelihood is mainly based on forest and trees, people had special respect to the forest due to its spiritual, ecological and economical importance. Selling fuelwood was started in the past few decades. The marginalized minority groups in the area, Manjos, started to sell fuelwood in 1986 in Welo Shoba *Kebele* when they settled along the main road during the *Derg* villegaization program. The practice expanded to the marginalized minority groups in adjacent *kebeles* (mainly Beto) who widely started to sell fuelwood in the 1990s. The Shakichos started to sell fuelwood in 1997. Many of them joined selling fuelwood during 1999–2000. The number of Shakichos who sold fuelwood highly increased from 2001–2005. The demand for fuelwood also increased in Masha town. One horse back of fuelwood fetches 7 to 8 Birr. Hence, people started to buy horses for selling fuelwood by selling their cattle. Previously, it was shameful to sell agricultural products. Until the past few years, people did not sell animal products including milk. It is still shameful to sell fuelwood among Shakichos except for children. (See the picture below that shows children selling fuelwood transported on the horses' back) (Figure 4.7).



**Figure 4.7 Children selling firewood**

Higher demands from the town, lack of subsistence among marginalized groups are identified as the reasons behind charcoal and fuelwood selling.

Twelve youngsters who bring fuelwood to Masha town through three main roads were interviewed on various issues related with fuelwood selling. The children were 9 to 16 years old. They were students either currently attending school or dropouts for different reasons. But, three of them did not join school at all. All of them were selling fuelwood on horse's back. Many of them took fuelwood one to three times (rounds) a day. They had one to three extra horses that enable them take as much rounds as possible to the market. Their families collected the fuelwood from the forest, mainly 'cultural' forest. None of the parents would attempt to take a single bundle of fuelwood to the market as it is shameful for adults. The children stated that "their peers would laugh at them" if their parents tried to sell fuelwood. The children confirmed that their parents do not permit them to buy even a cup of tea (for fifty cents) for themselves out of the six to eight Birr they usually get from buyers. This shows that the parents exploit child-labor due to their inability to violate cultural views that discourage selling fuelwood by adults.

The reasons for selling fuelwood, that many of the youngsters explained, were inability to cover school expenses and to buy cloth for those who did not attend school. However, the stated reasons appeared to be only convenient ones in order to cover the shameful act of the parents who collect fuelwood for them. Many of the children did not regret to tell the fact that they preferred to sell fuelwood instead of selling surplus 'enset' and maize except for two of them who had no surplus 'enset' or maize to sell. The rest stated that their parents had enough 'enset' and maize at home but selling fuelwood was preferred as it had more demand in the market. It implies that the attitudinal change among parents towards selling firewood, the demand for fuelwood from the market and pressing economic problems on very few people are the major causes of deforestation in the area related with firewood.

Selling fuelwood in addition to charcoal among the marginalized Manjos is a little bit different. They transport the wood on their back, though they precede the Shakichos who recently started selling forest products. The Manjos resorted to selling fuelwood due to the social, economic and cultural isolation that affects them.

## 4.8 Changes in belief system

The traditional belief system of the *Shakicho* people had contributed to the forest conservation and other natural resources management. The beliefs, values, norms and customs related with *guudo* and *deedo* worship is central to the conservation values related with religion.

### 4.8.1 Traditional belief

#### *Guudo*

The concept *guudo* is used to refer to two interrelated ideas. Firstly, it stands to mean cultural forest on mountainous areas conserved for many generations due to the taboos imposed by the traditional belief. Secondly, *guudo* refers to a particular place at the center of the cultural forest where clan leaders conduct sacrament or provide an offering (slaughtering an ox or sheep) to honor or appease a god. *Guudos* in waterfall areas are called *dingaro*. Such areas are intimidating as they are dark due to the dense vegetation. The sacrament is usually slaughtering an ox. The practice is believed to avoid catastrophes related with heavy rainfall with hail, wind, disease or crop damage. The provision of sacraments is not currently practiced in many places. Areas identified as *guudo* are feared and people are not allowed to enter. Informants state that rainbows usually appear on the *guudo* area but disappear when people approach the area. Consequently, the forest surrounding the *guudo* areas has special respect that prohibits extraction. People strictly observe the taboo imposed in *guudo* areas as violation might cause unexpected death by lightening. Informants stated their belief that huge things including huge tree; huge man and huge stone have a respect among the *Shakichos*. *Guudos* are also found in uplands, usually hills or strip of mountains, and people protect such forest areas from illegal use and deforestation, as cultural forests. The resource and habitat taboos imposed on cultural forests through *guudo* worship in Sheka had a profound importance in forest and its biological diversity conservation until the expansion of new religion in 1990s.

***Deedo:*** It is a type of tree under which prayer or religious ceremony is conducted. *Deedo* is fenced by 'sisino' tree (stems of tree fern) where all the people in that area gather to conduct prayer rituals led by clan leaders (Figure 4.8). It incorporates children, adults and elders of both sexes where local beer, made of *teff* (*borde*), is served and an ox is slaughtered for the participants. The celebration lasts three days until the food and drinks prepared is consumed. The main purpose of the ceremony is to conduct prayer for peace, health for their animals and for the people, and to avoid natural catastrophes that harm their environment such as heavy rain and diseases. *Deedo* sacraments and rituals were commonly conducted on

December 29<sup>th</sup> of every year, but have rarely been conducted in many places since December 1996.



**Figure 4.8** *Deedo* at the back of clan leader's home where prayer and ritual is conducted

Apart from its conservation value for endangered tree species in the area, the *deedo* ceremonies strengthen societal common understanding towards conservation. Nevertheless, following the conversion of most of the people to protestant Christians, it is rarely conducted. Though there are four *deedos* in Beto *Kebele*, there have been no ritual and sacrament conducted under them recently. Many of the *Oro* trees under which the *deedo* ceremony used to be conducted have been cut down. The species is also intensively used for honey production and other purposes. Sacred groves are example of how tradition, religious or socio-cultural practices lead to environmental preservation or sound resource management (Colding and Folke 1997). Hence, the belief in *deedo* is part of TEK that protected the endangered *ororo* species.

#### 4.8.2 The expansion of new religion

The Shakichos were Orthodox Christians before 1986. The introduction of protestant Christian religion is traced to the year 1974 when a white man (a missionary) constructed his house in Anderacha *Woreda* in a place called Guumuu around Geecha. The missionaries gave medical service occasionally coming by plane. They took a youngster from the area and returned him after teaching him the protestant Christian theology. However, protestant and other religions were forbidden during the *Derg* regime until the practice of any religion became a constitutional right during the EPRDF regime since 1993.

After the fall of the *Derg* regime in 1993, people started to convert to the protestant church. There was slow conversion during its early expansion period from 1993 to 2000. The time of fast conversion was from 2001 to present, and an estimated 75–80% of the total population are followers of protestant Christian religion today.

As a result, forest management role of clan leaders have gradually diminished, as the new doctrine does not accept the practice of the clan leaders such as swearing, cursing, rituals and sacraments related with worship.

The conversion of people into protestant Christians has a serious impact on the traditional resource management practices. Cultural forests, wetlands, and riverine forests that were conserved through the traditional beliefs for centuries are endangered due to the new belief systems. This is evident from Patrica Kabatabaz's research that the spread of new religion such Islam and Christianity in Kenya also had a negative impact on the preservation of traditional practices as the proponents of the new religions refer local knowledge of skills and technology as satanic, primitive, backward and outdated Kabatabaz (nd). Previous studies also confirm that Western education and religion have often failed to understand that communities, through folklore and taboos, have the capacity to protect wildlife and forests<sup>2</sup> This contributed to the large-scale deforestation of cultural forests for the expansion of agricultural land and fuelwood. Hence, the introduction of new religion contributed to the diminishing role of traditional resource management resulting in environmental degradation. However, there are still people who believe in the importance of traditional resource management.

#### 4.9 Investment projects (tea and coffee plantations)

---

<sup>2</sup> [http://www.iied.org/sarl/pla\\_notes/pla\\_backissues/documents/plan\\_02805.pdf](http://www.iied.org/sarl/pla_notes/pla_backissues/documents/plan_02805.pdf)

The zonal investment office indicated that there are over 43 different investment projects. The East African Chewaka Uto Tea Plantation and the Kodo Coffee Plantations are among investment projects under implementation in Masha *Woreda*. The latter started implementation in the past few months without the consent of the local people. This study focused mainly on the East African Chewaka Uto Tea Plantation.

#### 4.9.1 East African Chewaka-Uto Tea Plantation

The East African Chewaka-Uto Tea Plantation signed an agreement with the local government officials in 1995. The tea plantation started in 1996 on 31 hectares of land out of the 3,435 hectares it was granted by local authorities.

The East African tea plantation was established on a secondary forest that had regenerated on a previously settlement area which was abandoned in 1986 for villagization. It is located on the right side of the main road towards Gore (North), between *Hursitu* and *Yayibuni* Rivers. The company agreed to cultivate only the secondary forest in the area. The few elders who were part of the agreement indicated that they did not understand the area agreed to include the thousands of hectares mentioned on the paper. Many of the people, did not know the decisions made on the land they hold through their customary right.

The investment project gradually expanded in many directions into the natural forest. It expanded to the West towards the Baro River beyond the boundary of the agreement mainly since 2000 without giving compensation to the people holding the land. The people who hold the natural forest through *kobbo* system did not get any compensation until 2004 when the investment faced challenges and conflict from the local people in Welo Shoba *Kebele*. People who have been confiscated their land received compensation of about 600–800 Birr in Keja *Kebele*; and 27 people in Welo Shoba *Kebele* received about 1,200–1,500 Birr each. The compensation payment was insignificant as individual households' used to get Birr 1,000–2,500 annually only from the selling of honey, though this needs further economic analysis. In relation to the Birr 54,810 per year that the East African Tea Plantation is paying for land rent for 870 hectares of land covered with the tea plantation, the compensation payment is not also significant.

According to the EAA Company representative, objective of the investment project is also to change the livelihood of the local community. He stated that the community in the plantation area “should not continue as honey collectors”; that the investment project wishes to improve their life by involving them in the tea plantation project mainly as daily laborers. Few individuals have benefited from the plantation by renting their house to workers who come from far away to work in the plantation. Substantial

number of the people could get an employment opportunity in the project. There is also an attempt by the investor to expand tea plantation on the farmers' land though, so far, this has been practiced only on the *kebele* chairman's farm.

Many informants, however, argued that employment opportunity was not equally available to the native people; priority was given to those who came from other places. The employment opportunity is also not highly valued among many of the local people; it is rather taken as a sign of impoverishment, due to the destruction of their natural forest by dozers along with beehives hanged on it. Some members of the community view the employment opportunity, which people take because they have no choice as their land has been taken by the investor, as enslavement, not being their own masters anymore. Their children become daily laborers, earning five Birr per day, and there is no other opportunity, since the natural forest has been cleared together with their beehives, variety of spices, wild coffee and other NTFP. The income that a single family earns from the plantation is not comparable with income from a single sack of honey, not including lianas and spices. The lianas that they used to extract within half an hour of walk required up to three and half hours walk under current situation.

The livelihood of many farmers has changed from self-sufficient to daily laborers depending of the company. Twenty-five people (husband, wife, or both), that account for 50 per cent of the dwellers in the area, have become daily laborers only from Wundebech 'got' of Welo Shoba *Kebele*. Wild animals including lions and tigers have migrated from the area. Bees are killed with the insecticides used on the tea plantation, resulting in significant reduction of bee colonies and honey production. Many informants estimate the reduction to be over 50 per cent of the earlier/normal production. Those who were dispossessed of their forestland migrated to Do'a Goji areas of Oromiya Region for harvesting honey through equal sharing agreement with the owners.

Both the EAA representative and the community members indicated that during the project inception, the company did not have smooth relation either with government officials or with the local community. The disagreement between the local community and the investor mainly resulted from the lack of the investor's commitment to the original agreement made in terms of infrastructure construction and the expansion of the plantation site. Representatives of the local community who participated in the agreement revealed that the investor promised to construct school, airport, clinic, and to provide or improve transport services in the area. However, the community in the area still suffers from lack of such basic infrastructure.

The growing number of population at the investment site is creating multidimensional socio-economic and cultural problems that affect the existing people's livelihood and the environment. In 1987 during the project commencement, there were 60 households in the area. Currently there are about 300 households living in Chewaka area who came to the area due to the employment opportunity created by the tea plantation. The increase became a huge burden to the remaining forest and other natural resources. The workers employed in the plantation originate from other places with different backgrounds. Stealing honey and bee colonies have become common phenomena, which endangers the traditional *kobbo* management.

Most of the workers employed in the plantation are youths from different geographical and socio-cultural background. They need consistent follow up and basic social services. There is no center where they can get reproductive health education. The informants indicated that there is rampant spread of sexually transmitted diseases including HIV/AIDS, lack of FP (Family Planning) service and unwanted pregnancy. Theft, murder and related crimes become common, as there are people with unknown background coming to the plantation area. Transmission of various epidemics, marriage dissolution and family disintegration increased.

The investment project cleared riverine forest along the Baro River, further beyond the boundary of land given to it to develop, and against the culture of the local community, which prohibits clearing vegetation along river banks. The investor also destructed Muslim burial places and traditional worship places. Four burial places and three *deedos* have been destroyed only in Wundebech 'got' of Welo Shoba *Kebele*. The company also cleared traditional worship place in Ufina and Baro sides. People believe that this has brought drought to the area. The local people do not accept anymore *kebele* administrators who condemn people who cut trees for making house poles as they have seen the East African dozers burying natural forests with their beehives and tracks transporting big stems. This shows that the government granted the forestlands to the investors without considering the emotional and spiritual relationship rural people have with nature. Jackson (2004) indicated that investments oriented towards economic development with little or no regard to aspirations of indigenous people lead to environmental degradation. Likewise, Owusu-Koranteng (2003) indicated that the destruction of forest by investment companies in Ghana has contributed to the poverty and worsening living conditions of rural communities which also can be clearly observed from the experience of the Shekas of South west Ethiopia.

In general, the following points are drawn from the assessment conducted on investment site that has dramatically affected the culture of Sheka people in resource use and conservation:



The surrounding community lost their forest and NTFPs such as honey, cardamom, *timiz*, etc. which was the bases of their existence.

The company cleared riverine forest along the Baro River, which was beyond the boundary of agreement with elders and against the culture of the local community.

Large scale deforestation conducted against the traditional conservation system, specially riverine vegetation and cultural sites has influenced members of the local community encouraging them to take part in deforestation activities themselves.

The company destroyed burial and traditional worship places. They cultivated traditional worship place in Ufina and along the Baro River which they believe has brought drought to the area.

Impoverishment as a result of the destruction by the investor's dozer of natural forest along with beehives hanged on it formerly administered through *Kobbo* rule.

The increasing population due to the plantation is a huge burden to the remaining forest and other natural resources. There is an expansion of charcoal and fuelwood selling in the area. Most of the workers who come to work in the plantation are from other places who may not have similar values towards forest conservation with the natives. Stealing beehives with honey has become common phenomena which threatens the traditional management of *Kobbo*.

Most of the workers employed in the plantation are youths from different geographical and socio-cultural backgrounds that need consistent follow up and basic social services. There is no center where they can get reproductive health education. The informants said that there is rampant spread of sexually transmitted diseases including HIV/AIDS due to lack of reproductive health service. Various diseases are transmitted to the local people through workers who come from other areas.

Unwanted pregnancies that were shameful among the indigenous people in early days have become common among the youth working in the plantation. Marriage dissolution, family disintegration, theft, murder, battery, and related crimes are observed repeatedly, as there are people with unknown background working in the plantation. The growing social problems in the area erodes the traditional ecological resource management.

There is little acceptance of *kebele* administrators who condemn illegal cutting of trees by the local people. This is an attitudinal change resulting from observation of the East African dozers burying natural forests with their beehives and tracks transporting big stems.

Many people have been forced to shift their life style from farming to daily labor.

Many people have been forced to migrate with their children to Do'a Goji areas of Oromiya Region to harvest honey through equal share agreement with the locals as a coping strategy to the problem created.

Wild animals have migrated from the area and bee colonies have been killed and reduced due to the unselective use of insecticides at the tea plantation.



As summarized in the table, traditional resource management system played a prominent role during the pre 1974 or imperial period. During the military regime the erosion of the belief system and the weakening of traditional resource management system and implementation of development programs such as villegization without the consent of the community contributed to environmental degradation. Change in the belief system; expansion of investments in the natural forest without indigenous peoples' assent and its associated problems brought cultural change in resource utilization and conservation that aggravated natural resource degradation.

#### 4.10 Conclusions

Information gathered through different mechanisms verifies that Masha is one of the areas endowed with rich natural resource in Southwest Ethiopia. The community in the area has strong relation with their environment that enabled them to develop their own conception of resource management.

Forests, wetlands, rivers and waterfalls are natural resources that the communities manage through their TEC. The forest in the study area can be divided into cultural forests and large forest areas located close to the Baro River based on the conception of the community towards the forest, their geographical location and its importance to their livelihood.

The base for the conservation of cultural forests, wetlands and riverine forest and waterfalls is the religious beliefs that impose resource and habitat taboos through the *guudo* and *deedo* belief system. Large forest areas were administered through inherited customary in the *Kobo* system.

The Shakichos strongly believe that there is a strong relationship between the wetlands, rivers and forests in their environment. Wetland is a source of rivers and forests keep wetlands from drying, i.e., the natural forest along river banks, waterfalls and wetlands are the base for rivers.

The gradual weakening of traditional social organization of Sheka people that consists of the king (*Shekitato*), councils (*mikiracho*), clan leaders (*gepitato*) lead to the increased degradation of natural resources. The shift of cultural forest management towards government ownership, mainly since October 2004, could not reduce the increasing deforestation. It rather increased deforestation, as the original holders cannot reclaim their own ownership to prevent deforestation.

Selling fuelwood, with its obvious consequence, started in the past few decades. People who sell fuelwood and charcoal greatly increased from 2001–2005. The attitudinal change among people towards selling firewood, the demand for fuelwood from the market and pressing economic problems

on very few people and socio-economic problem of the marginalized minority groups (Manjos) are the major causes of deforestation related with firewood.

The spread of new beliefs and the expansion of unchecked investment coupled with the diminished role of clan leaders in forest management have endangered the traditional resource conservation system aggravating environmental degradation. The beliefs, values, norms and customs related with *guudo* and *deedo* worship promote conservation. However, these traditional beliefs are undermined due to the wide spread of new religion mainly since the 1990s and the diffusion of external cultures to the area. This in turn resulted in large-scale deforestation due to the change in the conception of the people regarding the traditional resource management. Large areas of forest are being converted to farmlands.

The expansion of investment projects has contributed to income generation from tax and created employment opportunities for the local people and outsiders. Many of the informants, however, stressed that problems associated with the investment outweighs the employment opportunity and other benefits.

According to most informants, the East African Chewaka Uto tea plantation has increased the deforestation trend in the area. Granting the natural forest for investment without the consent of the people who own the forest through their customary right has multidirectional impact. It clearly showed lack of clear provisions ensuring the free and informed consent of indigenous peoples prior to actions affecting their lands and resources. It also made clear that there is lack of fair and clear forest policy that considers the customary right of the local community/ and that the government supports investors without due consideration of the life of the community depending on the natural forest.

The livelihood of the Shakicho people is largely dependent on timber and non-timber forest products. Problems associated with the establishment of the investment project, hence, affected the culture of the people. The direct deforestation by the investment forced the shift of many of them from farmers to daily laborers. The investment activity forced people and wild animals to leave the area in search of other suitable environment. Economic crises on the local community and violation of cultural taboos brought change in the local community's attitude, resulting in more deforestation. The growing population due to in-migrant workers of the tea plantation, and the expansion of social problems on the existing limited resources also increased illegal extraction of forest products. In general, it can be concluded that the change in the belief system and the investment project both

dramatically altered the resource management practices of the indigenous people, thereby increasing the natural resource degradation.

#### **4.11 Recommendations**

- Creating participatory forum for the compensation of indigenous peoples' traditional lands and territories that were incorporated in plantation areas without their free and informed consent;
- Ensuring legal rights for indigenous communities over their customary lands by considering their life style which is strongly related with forest and the crucial contribution of their knowledge for the management and conservation of resources;
- Ensuring that indigenous communities' customary subsistence use of their forests is accommodated in future investment projects in the area;
- Designing environmentally friendly alternative investment options to reduce investment related large-scale deforestation;
- Developing standard formats and schedule that enables follow-up and control of investment projects so as to take immediate measures;
- Expanding social services in the investment area and controlling of investment related social problems;
- Supporting indigenous peoples to develop culturally appropriate mechanisms to share information and experiences and to organize themselves to deal effectively with outside initiatives affecting their rights and livelihoods;
- Giving indigenous communities authority and decision-making power by helping them to develop new management institutions with legal personality, that base their customary norms, worldview and values;
- Supporting indigenous organizations and representatives with training and capacity building on different options for developing systems to protect traditional knowledge, involving cultural exchanges with indigenous and traditional community groups from other regions such as South Africa, India and Panama where indigenous communities have been working on these issues;
- Creating advocacy forum focusing on the role of traditional knowledge in forest and other natural resource management;
- Recording traditional knowledge to archive before it falls out of use (to prevent it from being lost completely) in national and international databases without excluding locally based initiatives;

- Promoting effective use of beliefs as a potential benefit for the conservation of the forests and other resources through advocacy programs with religious and clan leaders as well as the community;
- Promoting the protection of sacred groves through religious or socio-cultural practices that lead to environmental preservation or sound resource management;
- Ensuring alternative energy sources and income generation mechanisms to reduce deforestation related with fuelwood consumption;
- Ensuring equal resource access, reduce social and economic isolation and provide the necessary support to improve the socio-economic condition of marginalized minorities
- Promoting the use of modern beehives to reduce deforestation related with making traditional beehives;
- Ensuring that the recommendations are considered and incorporated into the government plans to modify the legal and institutional framework of forest management.

#### 4.12 References

- Berkes, F. (1999) *Sacred Ecology, Traditional Ecological Knowledge and Resource Management*. Philadelphia, PA, USA: Taylor and Francis.
- Central Tibetan Administration (2000). Guidelines for International Development Projects and Sustainable Investment in Tibet (Unpublished).
- Colding, J. and Folke, C. (1997). The relations among threatened species, their protection, and taboos. *Conservation Ecology* [online] 1(1): 6. Available from the Internet. URL: <http://www.consecol.org/vol1/iss1/art6/>.
- Colding, J. and Folk, C. (2001). Social Taboos: "Invisible" systems of local resource management and biological conservation. *Ecological Applications* **11**(2):584–600.
- Daba Wirtu (2000). Environmental Profile of Ethiopia: At the Dawn of the Third Millennium, Addis Ababa, Ethiopia.
- Davidson-Hunt, I. and Berkes, F. (1999). Changing Resource Management Paradigms, Traditional Ecological Knowledge, and Non-timber Forest Products. **In:** *Forest Communities in the Third Millennium: Linking Research, Business, and Policy Toward a Sustainable Non-Timber Forest Product Sector* Pp 78–92. (Davidson-Hunt, I., Duchesne, L.C. and Zasada, J.C., eds). Proceedings of a meeting held October 1-4, 1999 Kenora, Ontario, Canada. Available at <http://ncrs.fs.fed.us/pubs/gtr/other/gtr-nc217/index.htm>
- Down to Earth (2002). Statement by Indonesian NGO's on Indonesia-UK logging MoU. (2002). Joint Statement of Indonesian NGOs and the Indigenous Peoples' Alliance of the Archipelago on the bilateral agreement between the Government of Indonesia and the Government of the United Kingdom on co-operation to

- improve forest law enforcement and governance and to combat illegal logging and the international trade in illegally logged timber and wood products, 17th April 2002. Available at International Campaign for Ecological Justice in Indonesia: (<http://dte.gn.apc.org/Cfst1.htm>).
- Elwell, W. Frank (2001). Marvin Harris's Cultural Materialism "A site for undergraduates" Rogers State University.
- Folke, C. (2004). Traditional knowledge in social–ecological systems. *Ecology and Society* 9(3):7. [Online] <http://www.ecologyandsociety.org/vol9/-iss3/art7/>.
- Gregoire, H. and Lebner, A. (2000). Re-evaluating Relevance: Intellectual Property Rights and Women's Traditional Environmental Knowledge. CSD NGO Women's Caucus Position Paper for CSD-8, Available at [www.earthsummit2002.org/-wcaucus/Caucus Position Papers/tek.htm](http://www.earthsummit2002.org/-wcaucus/Caucus Position Papers/tek.htm).
- Hornborg, A. (n.d). Cultural Ecology. A note available at [http://www.humecol.lu.se/docs/cultural\\_ecology.rtf](http://www.humecol.lu.se/docs/cultural_ecology.rtf)
- Jackson, D. (2004). Implementation of international commitments on traditional forest-related knowledge: Indigenous peoples' experiences in Central Africa. A paper presented at the Expert Meeting on Traditional Forest-Related Knowledge (TFRK) 6-10 December 2004, Forest People Program, San Jose, Costa Rica. 94 pp.
- Johnson, M. (1992). Dene Traditional Knowledge. *Northern Perspectives* 20(1). Available at: <http://www.carc.org/pubs/v20no1/dene.htm>
- Kabatabazi, P. (n.d.) Challenges Facing Indigenous Knowledge: Role of Culture in Sustainable Use of Natural Resources. Kampala – Uganda. Available at: <http://www.blackherbals.com/index.html>.
- Makhan, J. (1998). *Introduction of Social Anthropology*, 2<sup>nd</sup> revised edition.
- Mengistu Seyoum (1995). Social Organization of Production among the Sekacco of Southwestern Ethiopia, MA Thesis in Social Anthropology, Addis Ababa University, Addis Ababa
- Mengistu Seyoum (2001). Shakicho. **In:** *Living on the Edge: Marginalized Minorities of Craft Workers and Workers and Hunters in Southern Ethiopia*. (Pankhurst, A. and Freeman, D., eds). Department of Sociology and Social Administration, College of Social Sciences, Addis Ababa University
- Millon Belay and Sue Edwards (2004). Finding about Cultural Biodiversity: A First Guide Book. Institute for Sustainable Development, Addis Ababa, Ethiopia.
- NTFP (2004). Non Timber Forest Products Research and Development Project in SW Ethiopia. Baseline description of project area: Summary of participatory appraisal data at *kebele* and *got* level. Wageningen, 45 pp.
- Owusu-Koranteng, D. (2003). Presentation by Daniel Owusu-Koranteng on The Indigenous Peoples Experiences with Mining and the Conservation of Biodiversity at the Iucn-Icmm Dialogue in Switzerland (7–9<sup>th</sup> July 2003).
- PLA (1997). Folklore and conservation in Nigeria: Using PRA to learn from the elders Ichire Ojating and the students of the Federal University of Agriculture (FUAU) PLA Notes CD-ROM 1988–2001 Source: PLA Notes (1997), Issue 28, pp.22–24, IIED, London



- Richards, M. (1997). Tragedy of the Commons for Community-Based Forest Management in Latin America. Overseas Development Institute Portland, House Stag Place, London SW1E 5DP, UK.
- Roth, R. (2004). Spatial organization of environmental knowledge: conservation conflicts in the inhabited forest of northern Thailand. *Ecology and Society* 9(3): 5. [Online] <http://www.ecologyandsociety.org/vol9/iss3/art5/>.
- Singh, L.J., Singh, N.B. and Gupta, A. (2006) Environmental Ethics in the Culture of Meeteis. Manipuronline, A Virgo Communications Company, India. [http://www.manipuronline.com/Manipur/February2006/environmentalethics06\\_1.htm](http://www.manipuronline.com/Manipur/February2006/environmentalethics06_1.htm)
- Stevenson, M.G. (1998). Traditional knowledge and environmental management: from commodity to process. Paper for NAFA conference, Celebrating Partnerships. September 14-18, 1998. Prince Albert, SK.
- SZCID (2004). Sheka Zone Culture and Information Department, Report.
- SZFEDCO (1997 E.C.). Sheka Zone Finance and Economic Development Coordination office, annual report
- Tadesse Woldemariam (2002). Conservation and Use of the wild coffee population of *Coffea arabica* in the Montane Rainforests of Ethiopia, Project Proposal for Biosphere Research inTEgrative and Application Oriented Model Projects-Bio Team, ZEF, Bonn.
- Teklu Tesfaye and Thomas, B. (2004). Wild arabica coffee populations under severe threat: Farmers' perception of existence, access to and conservation needs in the Montane Rainforests. A paper presented on the Conference on International Agricultural Research for Development, Ethiopia Deutscher Tropentag 2004-Berlin, 5-7 October 2004.
- Tsuji, L.J.S. (1996). Loss of Cree traditional ecological knowledge in the Western James Bay Region of Northern Ontario, Canada: A case study of the sharp-tailed grouse, *Tympanuchus Phasianellus* *The Canadian Journal of Native Studies* XVI(2):283-292 Available at: <http://www.brandonu.ca/Library/-CJNS/16.2/tsuji.pdf>.
- University of British Columbia (2002). Global Perspectives on Indigenous Peoples' Forestry: Linking Communities, Commerce and Conservation. On an International Conference organized by: the University of British Columbia (UBC) Faculty of Forestry, Forest Trends, the UBC First Nations House of Learning, Isaac Forest Resources, Ecotrust Canada, and The National Aboriginal Forestry Association Vancouver, British Columbia, Canada June 4-6, 2002.
- Warner, M. and Philip, J. (1998). Assessing the Need to Manage Conflict in Community-Based Natural Resource Projects. Number 35, July 1998.
- Yilma Abebe and Geheb, K. (2003). Wetlands of Ethiopia, *Proceedings of Seminar on the Resource and Status of Ethiopia's Wetlands*, Vi+ 166 PP.

## **5 Legal and institutional analysis for sustainable use of forest resources: the case of Sheka Forest in southwest Ethiopia**

**Mellese Damtie and Mohammud Abdulahi**

### **5.1 Summary**

Forests have multifarious functions and uses to mankind and other living organisms. Forests play indispensable roles in the life support systems on our planet. Problems of deforestation and serious damage to our natural environment are the major threat to the life support system of our planet and to human existence itself. The roles played by local communities in sustainable use of forest resources have been recognized by researchers and even policy-makers and politicians. However the level of recognition may be, as practice and studies revealed, it has not been possible to stop the destruction of these precious resources, mainly by human activities. The unchecked deforestation activities and damage to our environment are caused by many factors such as population pressure, expansion of agricultural fields, and unsustainable development approaches through laws, policies, strategies and programs. In Ethiopia, for instance, it has been repeatedly said that the forestland, which covered a considerable portion of the country at the beginning of the 20<sup>th</sup> century, has now shrunk to only 2–3% cover. At present, the areas which are mainly covered with the remaining forests are found in the Southwestern part of the country.

Deforestation activities which are extremely intensified in recent years for various reasons, are now threatening the country very seriously. If the present situations continue unabated, the country will remain without natural forest in the near future. Sheka area, which was considered as the '*Ethiopian Amazon*' in the past, is now being cleared by ruthless deforestation activities. In countries like Ethiopia with agrarian society, where the great majority of people and their way of life (rain-fed agriculture) is highly dependent on natural resources, the loss of the remaining forests would have catastrophic consequences.

Laws have been put in place to protect the environment, mainly forests and the wildlife, since long ago. Modern laws started to appear during the era of Emperor Menelik II, towards the end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century. Although many laws were made and various institutions were established for the purpose of implementing those laws, they were unable to stop, or even to reduce the massive destruction of the natural environment, that aggravated with time. On the side of the Ethiopian

Government, there have been efforts to enact forest and land laws and to establish various institutions, which have a direct bearing on protecting forest resources. However, these efforts did not bring about positive changes in the protection of our forest resources. What is wrong with the laws and institutions? Is there an inherent problem with them? Or is it just lack of commitment in implementing them? How can the continuation of deforestation be explained? Who are the main actors of the deforestation activity?

This study is centered on legal and institutional framework within which the natural forests in the Southwestern part of Ethiopia are meant to be protected and conserved. The study has tried to cover a wider scope by raising various cross-sectoral legal, policy, and institutional issues.

Ethiopia has a good Constitution as far as protection of the natural environment is concerned. The Constitution guarantees the land ownership rights of the Nations, Nationalities and Peoples, (which can be considered as indigenous peoples and/or their local communities). Moreover, the Constitution recognizes the self-determination rights of these groups, which actually includes their cultural and ecological rights. However, the subordinate legislation at both the Federal and Regional level do not fully recognize these rights which are enshrined in the Constitution. Even those rights recognized in the subordinate legislation themselves are not fully materialized in some instances. For instance, before ‘development projects’ are conducted, it the right of the local communities to discuss on the matter and give their full and free consent. As discovered by the present study, this right of the local communities has been ignored in most of the cases. ‘Development projects’ seriously affect the life of local communities by taking away their rights on the land and on forest resources. It will be a gross violation of the fundamental rights of the local communities to conduct a development project without securing their full and free consent.

In today’s world, development at international level highly influences the domestic affairs of a country in various aspects. One among these is the recognition of the rights of local and traditional communities on their land and environment. The increasing recognition of their rights has even influenced the dimension of the concept of human rights by trying to address aspects of collective rights. The establishment of a Working Group on Indigenous Peoples (WGIP) in 1977 under UNESCO; the recognition of the peoples’ right to self-determination under the 1966 human rights covenants; and the UN Draft Declaration on Rights of Indigenous Peoples are some of the developments under international law. Particularly, the 1989 ILO Convention № 169 with its binding nature is now almost acquiring the status of customary international law. All these international instruments have made one thing clear – the various rights of local communities and the

special relations they have with their land and territory. The international instruments also make it clear that local communities are playing great role for the protection of our natural environment.

In Ethiopia, the influences of the above-mentioned developments at international level are already reflected in the 1995 Constitution. Even if other subordinate legislation such as the 1994 Forestry Proclamation, the 2002 environmental legislation, investment laws which have been enacted at different times, the 2005 Rural Land Administration Proclamation, and other laws of the Federal as well as Regional Governments' laws have been influenced by these international developments, they still need revision to conform with the 1995 Constitution and international developments. Most of these laws are not only inconsistent with the 1995 Constitution but are also some times contradictory to each other.

Due to institutional problems such as: lack of coordination among the various institutions; weak institutional arrangements; lack of the necessary skilled manpower, especially at the grassroots levels; lack of political commitment on the side of officials; lack of the culture of listening to expert opinions before decisions are made by political authorities; maladministration; overemphasis on rapid economic growth at the expense of the environment (through investment projects), among others, the country is suffering from severe environmental degradation. This study focuses and explores the possibilities for sustainable development—development that is holistic and does not support the growth of one component by destroying another aspect vital to life. A holistic development is possible when the rights of the local communities are truly respected through their active and direct participation to give their full and free consent on activities which affect their livelihood. Moreover, sustainable livelihood of these communities shall be ensured when their land and forest resource rights are fully respected. Such development can be attained when the laws of the Federal Government and those of the regional governments incorporate the useful traditional practices of the indigenous peoples and/or their local communities to benefit out of the ecological knowledge of these peoples in managing forest resources.

## **5.2 Introduction**

Much has been known of the uses and multifarious functions of forests. Researchers agree that forests play indispensable roles in the life support system on Earth. At the same time, the roles of local communities in the sustainable use of natural resources have been recognized by researchers and policy-makers all over the world. The international communities have also

recognized the importance of protecting our environment and the right of local communities. The proliferation of various international legal and policy documents in this regard is a clear evidence for this. This development at international level has influenced the domestic laws and policies of countries of the world, such as Ethiopia. In fact, in countries like Ethiopia, where the great majority of people are directly dependent on natural resources, the damage to the environment, unless abated would have catastrophic consequences.

This research work was aimed at identifying the legal and institutional problems that are contributing to the serious damage of the natural forests in Sheka Zone of Southwestern Ethiopia. The report has four major parts. Part one is about the international legal and policy framework related to sustainable use of natural resources and rights of local communities. The second part deals with the laws and institutions of the Federal Government of Ethiopia relevant to our issue. The third part focuses on the relevant laws and institutions at regional state level. The last part deals with the local institutions and the enforcement of laws at local level by specifically taking the case of Sheka Zone of SNNPR State. Finally, some recommendations have been made as a way forward to tackle the problems.

#### 5.2.1 Scope of the study

This section of the study, i.e., the legal and institutional analysis for sustainable use of forest resources, deals with the analysis of the international legal instruments which have relevance to forest resources and rights of indigenous peoples and/or their local communities or generally what is said to be group rights. Special emphasis is given to the ILO Convention 169 of 1989. It also deals with the national environmental legal regime of Ethiopia, both the Federal and Regional legal regimes. As far as the Federal laws are concerned, the study is limited to the analysis of the Constitution of the Federal Democratic Republic of Ethiopia (FDRE), the Federal land, Forest, Investment, Environmental Impact Assessment proclamations and the new Penal Code of May 8, 2005. Moreover, Federal policies on environment and forest (we have now only draft policy on forestry) are slightly touched. With respect to the regional laws, the study is limited to the analysis of SNNPRS land and forest laws, and the Oromia Regional States' land and forest laws. The latter laws have been used only for comparison purposes.

With respect to the institutional setup in relation to forest resources utilization is concerned, at federal level, the study is limited to the scrutiny of processes and procedures to the Ministry of Agriculture and Rural Development and Environmental Protection Authority, since these are considered to be the most concerned institutions as far as the study area is

concerned. At regional level, assessment of processes of various government offices has focused on the following offices: SNNP Regional State Environmental Protection and Land Administration and Utilization Authority; Investment Bureau; Agriculture and Natural Resources Bureau; Trade and Industry Bureau; the Regional Police Commission; and the Sheka Zone Administration Council; Rural Development Department; and Trade, Industry and Urban Development Department. Since it is the Zonal institutions which have a direct and immediate involvement in any decision regarding forest resources, much of the emphasis is given to the processes and procedures of these institutions. Although it was intended to include court decided cases in the study, we are unable to get such cases at any level of government in the country.

### 5.3 International legal and policy framework

In this part, we focus on three aspects of international instruments. First, international instruments related to the rights of local communities are analyzed secondly, international instruments on human rights protection are addressed, and finally we deal with various international instruments on issues of environmental protection.

#### 5.3.1 International instrument related to local communities

In various international instruments different names have been used such as 'indigenous peoples' 'tribal peoples' 'local community', *etc.* For instance, International Labor Organization (ILO) uses the name 'Indigenous' 'Tribal' and 'Semi-Tribal' peoples. For our purpose the name 'Local community' (LC) is used. In fact, the first international body which addressed the issue of local community was ILO. ILO is the UN specialized agency that has devoted more interest to such peoples. In 1957, ILO adopted Convention on the Protection and Integration of Indigenous and other Tribal and Semi-Tribal Population in Independent Countries. This Convention was aimed mainly at integrating indigenous peoples into the main stream of modern society. Article 2(1) of the Convention, for instance, provides that 'governments must take action for the progressive integration of indigenous peoples into the life of their respective countries'.

In 1989, ILO revised the 1957 Convention and adopted Convention 169 on the Protection of the Status of Indigenous and Tribal Peoples. As stated in the preamble, the main goal of this Convention was to remove the assimilationist orientation of the earlier Convention. But the important point

here is how Convention 169 defines the term "peoples". Article 1(1) provides that the Convention applies to:

- a) Tribal peoples in independent countries whose social cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations;
- b) Peoples in independent countries who are regarded as indigenous on account of their descent from the population which inhabited the country at the time of the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions.

It is also provided in this Convention that 'self-identification as indigenous or tribal shall be regarded as a fundamental criterion for determining the groups to which the provisions of this Convention applies.'<sup>1</sup> Therefore, the scope of application of Convention 169 is to indigenous and tribal peoples without differentiating or defining these peoples. This Convention is aimed at recognizing the rights and participation of indigenous and tribal peoples to exist as distinct peoples. The Convention is oriented towards the following issues:

- Consultation and participation as fundamental for all actions;
- Respect for the tradition, culture and ways of life of indigenous and tribal peoples;
- Self- management and providing resources and opportunities for indigenous and tribal peoples to decide their own future;
- Land ownership and possession rights of the people based on the concept of territories, which covers the total environment of the areas occupied or used by them.

The basic principles underlying the provisions of the Convention are:

- Right to self-identification as a fundamentals criterion
- Right of consultation and participation
- Right to decide their own priorities for development

Moreover, the Convention provides actions required of the governments. Governments are required to develop coordinated and systematic actions that protect the indigenous and tribal peoples and their integrity. The other action required of governments is to provide the resources for their development. Part Two of the Convention 169, which is related to land rights of local

---

<sup>1</sup>Sub-article 2 of the Article 1 of the 1989 ILO Convention169.

communities, has a special relevance to this study. In connection to the rights of indigenous peoples with respect to land, the Convention provides the following.<sup>2</sup>

#### **Article 13**

1. In applying the provisions of this part of the Convention, governments shall respect the special importance for the cultures and spiritual values of the peoples concerned of their relationship with the lands or territories or both as applicable which they occupy or otherwise use, and in particular the collective aspects of this relationship.
2. The use of the term **lands** in Article 15 and 16 shall include the concept of territories, which covers the total environment of the areas which the peoples concerned occupy or otherwise use.

#### **Article 14**

1. The rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognized. In addition, measures shall be taken in appropriate cases to safeguard the right of the peoples concerned to use lands not exclusively occupied by them, but to which they have traditionally had access for their subsistence and traditional activities. Particular attention shall be paid to the situation of nomadic peoples and shifting cultivators in this respect.
2. Governments shall take steps as necessary to identify the lands which the peoples concerned traditionally occupy, and to guarantee effective protection of their rights of ownership and possession.
3. Adequate procedures shall be established within the national legal system to resolve land claims by the peoples concerned.

#### **Article 15**

1. The rights of the peoples concerned to the natural resources pertaining to their lands shall be specially safeguarded. These rights include the right of these peoples to participate in the use, management and conservation of these resources. . .

#### **Article 16**

1. Subject to the following paragraphs of this Article, the peoples concerned shall not be removed from the lands which they occupy.

---

<sup>2</sup> Part II of the ILO Convention 169 adopted in 1989



2. Where the relocation of these peoples is considered necessary as an exceptional measure, such relocation shall take place only with their free and informed consent. Where their consent cannot be obtained, such relocation shall take place only following appropriate procedures established by national laws and regulations, including public inquiries where appropriate, which provide the opportunity for effective representation of the peoples concerned.
3. Where possible, these peoples shall have the right to return to their traditional lands, as soon as the grounds for relocation cease to exist.

Persons thus relocated shall be fully compensated for any resulting loss or injury. In addition to the ILO Conventions, several international conferences have also drawn attention to the plight of local communities. This process has resulted in the need for specific "indigenous rights". One best example in this regard is the 1977 International NGOs Conference on Discrimination against Indigenous Peoples of Americas held in Geneva. This Conference resulted in a Draft Declaration of principles calling for the recognition of indigenous peoples as subjects of international law.

Apart from what has been done by ILO, UN Economic and Social Council (ECOSOC) has also made some efforts to address issues of local communities. In fact, ECOSOC granted the first observer status to an indigenous organization in 1977. Then in 1982 ECOSOC approved the creation of a working group on indigenous peoples (WGIP) under the Sub-Commission. In 1984, the Sub-Commission urged WGIP to prepare "standards on the rights of indigenous populations" and to consider the drafting of a body of principles of indigenous rights (Galenkamp, 1993:49). The WGIP published its first draft Universal Declaration on the Rights of Indigenous Peoples in 1987 and the report was completed in 1993. This document has been adopted by the Sub-Commission in 1994 and submitted to the UN Human Rights Commission (UNHRC) for consideration. The draft Declaration (UNHCR, 1993) has a preamble of 19 paragraphs and an operational part of 45 articles divided into 9 sections. In its article 8, the draft Declaration provides:

- The collective rights to maintain and develop one's ethnic characteristic and identity;
- The collective right to protection against any act which has the aim or effect of depriving them of ethnic characteristic identity, including forced assimilation and propaganda against them; and
- The right to maintain, within their areas of settlement, their traditional economic structures and ways of life, to be secured in the enjoyment of their own traditional means of subsistence, and to engage freely in their traditional and other activities.

Generally, all the above discussed international process and instruments are specifically meant to address the plights of local communities. Among them, the two ILO Conventions only are legally binding instruments. The 1994 draft Declaration is still a draft and not legally binding as the name "declaration" expresses. Ethiopia is not party to both the 1957 and 1989 ILO Conventions. The 1989 ILO Convention 169 has not been ratified so far by any African state. More than half of the parties to this Convention are from Latin American countries. For Ethiopia, which has adopted a constitution in 1995 that belongs to its 'nations' 'nationalities' and 'peoples', this is particularly unfortunate.

### 5.3.2 International human rights instruments: aspects of collective rights

In the last few decades, we have witnessed a highly interesting development in the field of international legal practice, especially where human rights are concerned (Galenkamp 1993:13). Since the end of World War II (WWII), there has been proliferation of international binding legal documents designed for the protection of human rights. The 1948 Universal Declaration of Human Rights (UDHR), which is considered as the "magna carta" of human rights, is the departure point that resulted in successive legally binding human rights documents. Thus, in 1966 two major conventions on human rights were adopted. These are:

1. The 1966 International Convention on Civil and Political Rights (ICCPR); and
2. The 1966 International Convention on Economic, Social and Cultural Rights (ICESCR)

These and other international legal instruments provide both aspects of human rights - individual and collective. The focus of this study is on the collective aspect of human rights. United Nations human rights organs have proclaimed collective rights, rights which collectivities should have as a collectivity in order to protect their threatened collective interests (Galenkamp 1993:13). Thus, the UN General Assembly (UNGA) decided to declare 1993 'Year of Indigenous Right'. Collective rights are the "third generation rights" that may both be invoked against the state and demanded of it. They can be realized only through the concerted efforts of all actors on the social scene (Galenkamp 1993:14) and due to their explicitly collective outlook. Collective rights include the collective rights to development, to a healthy environment, to peace, to co-ownership of the common heritage of mankind, to communicate, and to preserve one's cultural identity.

There are three major theories developed on issues of collective rights, i.e. *globalist*, *third worldist*, and *nationalist*. The 'globalist' theory was developed in response to the increasing global problems which can only be solved through international cooperation. This theory is reflected in discussions related to the right to a healthy environment and the right to the common heritage of mankind. For the globalist, recognition and protection of collective rights are essential in light of the increasing global concerns such as pollution and exhaustion of natural resources, as a result of which the survival of mankind is said to be at stake.

The theory of "third-worldist" has much to do with the concept of "right to development" which was launched in a 1972 address in the Institute of Human Rights by Judge Keba M. Baye. In his address Judge Keba M. Baye considered the right to development as a human right since man cannot exist without development. Arguments of this theory are also related to problems of implementing individual human rights in Third-world states. The root cause of violation of human rights is viewed by those states as poverty. The collective rights are also viewed to fit better within the more communal worldview predominant in the third world.

The "Nationalist Theory" was developed in response to the increasing concern for the plights of minorities and other traditional groups within a state. The argument in this theory is related to the collective right to preserve one's cultural identity. This view has a root in the 1978 UNESCO Declaration on Race & Racial Prejudice which provides: "all individuals and groups have the right to be different, to consider themselves as different and to be regarded as such" (Galenkamp 1993:37). The nationalist view is based on perceived ethnic heterogeneity in most states of the world where one can better assume the predominance of societies in which there are all various sub-groups (Galenkamp 1993:37). Van Dyke said: "the requirements of logic and the long-term requirement of universal justice commend the idea of accepting communities as right and duty bearing units" (Van Dyke 1970:60).

Generally, various international human rights instruments have provided collective rights in the form of 'minority rights', 'peoples' rights' and 'indigenous rights'. We have already seen issues related to indigenous rights provided in ILO Conventions and other international instruments. Historically, the origin of the notion of minority rights can be traced back to World War First (WWI) with the establishment of the League of Nations. Minority rights are those that arise out of one's membership of national minorities. Minority rights require that the system of negative equality be supplemented by a regime of positive equality. This was normally done, during the League of Nations, by providing equal opportunity to minorities to preserve and develop their own culture. Since World War II, the emphasis

has been on individualistic human right. This, however, does not mean that the human rights instruments totally neglect the minority rights. The protection of rights of groups within a state has been the concern of the United Nations. For instance, on 28 March 1947, Sub-Commission on the Prevention of Discrimination and Protection of Minorities (the Sub-Commission) was established.

Though, the UDHR, the two Covenants of 1966 and the 1965 UN Convention on Racial Discrimination do not refer specifically to local communities or indigenous peoples, there are some provisions of those documents that talk about minority rights. For instance, Article 27 of the 1966 ICCPR provides some rights of minorities. It runs:

In those states in which ethnic, religious or linguistic minorities exists, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to their own culture, to profess and practice their own religion or to use their own language.

The 1966 ICESCR contains also a list of non-justifiable rights with, for instance, requirements for the adequate standard of living that could be related to issues of land and forced displacement. In principle, minority rights explicitly deal with the collective dimension of human existence. Thus, in the Human Rights Committee (HRC) general comment on Art. 27 of ICCPR, it was said:

With regard to the exercise of the cultural rights protected under article 27, culture manifests itself in many forms, including a particular way of life associated with the use of land resources specially in the case of indigenous peoples.

However, almost all minority rights provisions in human rights documents have only established at best, legal guarantee for the benefits of the individual members of the community concerned. That is why Thornberry said 'the current international law is reluctant to name groups as holders of rights, preferring to attribute rights to the members of the group' (Galenkamp 1993:46).

Since the Second World War, 'peoples rights' have enjoyed much currency in international law and in the United Nations practice. For instance, Article 1 of the two 1966 Human Rights Covenants deals with the 'peoples right' to self-determination. The term 'peoples' has not been defined in the United Nations instruments. Theoretically, however, the term refers to a broad

collection of subjects, varying from oppressed groups, populations, communities, nations, and ex-colonies (Galenkamp 1993:40). In the actual state practice, its legitimate use tends to be restricted to those peoples who have been under western colonial rule. Ethnic and national minorities within an independent state are, thus, excluded from being the legitimate bearers of this right – the right to self-determination.

One may take as an example, the 1981 African Charter of Human and Peoples' Rights. Under this Charter, the right to self-determination is guaranteed to all peoples. But it singles out colonized and oppressed peoples as the sole possessors of this right (ACHPR 1981)<sup>3</sup>. The 1981 UN report on the right to self-determination also provides (Critescu 1981:279):

A people should not be confused with ethnic, religious or linguistic minorities, whose existence and rights are recognized in Article 27 of ICCPR. The principle of self-determination cannot be regarded as authorizing dismemberment or amputation of sovereign states exercising their sovereigns by virtue of the principle of self-determination of peoples.

The main reason for such approach is the fact that the former colonies fear the separatist movements in their own fragile political system. Thus, state sovereignty and territorial integrity as supreme values which may nullify the claims of groups to a right to self-determination.

Intentionally or unintentionally, this approach has gradually led to equating of 'peoples' with 'states'. Most of the peoples rights are in fact considered rights of states in disguise where the rights of peoples are vested in a state and are exercised by the government of the state.

Surprisingly, however, Ethiopia has adopted a constitution in 1995 that challenges the above-discussed assumption by providing constitutional guarantee of the right to self-determination. Under Article 39 of the 1995 FDR Ethiopian Constitution, it is provided that 'nations', 'nationalities' and 'peoples' of Ethiopia have the right to self-determination upto secession. Thus, one can hardly assume, based on the above argument that the right of peoples are vested in a state and are exercised only by the government of the state. The Ethiopian Constitution also vested the right to land ownership in the state and in the nations, nationalities and peoples of Ethiopia. It is, however, a paradox that the practice in Ethiopia with regard to land ownership is considering the state as the sole owner of land disregarding the constitutional rights of the people. This issue will be dealt, in detail, within the next part of this paper.

---

<sup>3</sup> African Charter on Human and Peoples Rights (1981), Article 20

### 5.3.3 International environmental instruments and local communities

Issues of environmental protection and the rights of local communities have some essential relations. But what is the link between environmental protection and rights of local communities? Recent literature shows how the concept of land and environment are inextricably linked with local community's perspectives.

Most of the international environmental instruments have recognized the link between the two: environmental protection and local communities. For them land and environment have both cultural and functional values. The value of land and environment in indigenous culture is based on a holistic vision of their territory where the entire animal and vegetal world acquires particular meaning<sup>4</sup>. For instance, in local communities of Sheka Zone, forest is the cloth of rivers and hence should not be touched<sup>5</sup>. This cultural value is fundamental for the reproduction of the life of the rest in an ecosystem. It is emphasized that the link with their land and their environment is the feature that more clearly distinguishes local communities from other groups<sup>6</sup>. Thus, the threats to environment that could destroy their territories and degrade their system of survival can jeopardize the most important human rights of self-preservation as right to life and the right to physical integrity and the security of person.

In addition to the cultural value, land and environment also have some functional values. Based on the relation between the recognition of the rights of traditional people and the protection of environment, potentially one element can benefit the other and vice versa. The recognition of rights of local communities is, thus, functional to environment protection, as is already reflected in various international instruments.

From this perspective, the role of local communities in environmental protection has been recognized in various international environmental instruments. Such recognition begins with the introduction of the concepts of *sustainable development* and *right to development*. The concept of sustainable development was the result of an elaboration of the right to development based not only on economic values but also on every aspect of human life – social, cultural, etc, ... This concept was introduced in the 1987 Brundtland Commissions Report. Since then, the practices of local

---

<sup>4</sup> Discussion with Mr. Martin, the Colombian indigenous peoples rights activist and Director of GAIA Amazonas in Bogota, 2004.

<sup>5</sup> Discussion with Waltata Bahru, a traditional leader in Sheka, Masha Town, 2005.

<sup>6</sup> African Charter on Human and Peoples Rights (1981), Note 13.

communities have been recognized as examples of sustainable use of nature resources. In this respect, one may ask a question 'why are almost all the virgin and natural forests all over the world situated in areas where traditional people inhabit? We find most of the virgin and natural forests of the world from Africa to Latin America, to Asia and to Australia, where traditional peoples are inhabited, such as the Red Indians in Amazon Rainforest. These areas are now considered as the lung of our planet. One study (O'Neill, 1973:252) revealed that:

Eighty five per cent of all known plant species are situated in areas that are the traditional homelands of indigenous peoples. At the same time, between 50 and 80% of global species diversity are found in just twelve countries. In addition, tropical rainforests, which account for only 7% of all the earth's land surface and provide for 50 million indigenous peoples, are thought to contain well over half of the species in the entire world biota.

Several international environmental instruments recognize the role of traditional people in environmental protection. The 1987 Brundtland Commission's Report, for instance, provides that 'these communities are the repositories of vast accumulation of traditional knowledge and experience that links humanity with its ancient origins'. According to the report, the disappearance of traditional peoples is a loss for the larger society which could learn a great deal from their traditional skills in sustainable management of very complex ecological systems.

After this report, the landmark measures related to environmental protection are the various documents that came as a result of the 1992 United Nations Conference on Environment and Development (UNCED 1992a), at Rio De-Janeiro. One among those documents is the Rio Declaration on Environment and Development. Principle 22 of this Declaration underscored traditional peoples' role for environmental management and development. Thus, Principle 22 provides:

Indigenous peoples and their communities, and other local communities, have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

Non-legally binding Forest Principles of UNCED under Principle 12(d) provides also that 'appropriate indigenous capacity and local knowledge regarding the conservation and sustainable development of forests should be recognized, respected, recorded, developed and as appropriate introduced in the implementation of programs'.

The other very important document of UNCED is Agenda-21. Agenda -21 is a non-binding action plan on environment and development which is divided into 40 chapters. This document is the most important document since it contains detailed guidelines for the next century which also refer to advisable international law evaluation. Its Chapter 26 titled 'Recognizing and Strengthening the Role of Indigenous People and Their Communities' has much to do with our issue here. Chapter 26 of Agenda-21 (UNCED, 1992b:Chapter 26.4) recognizes the special link of indigenous peoples with their lands and the need for their participation in every question affecting them. It also establishes objectives for governments and international institutions, as well as measures to be undertaken by governments through international and national legislations. In particular, it calls for national and international efforts to implement environmentally sound and sustainable development that accommodate, promote and strengthen the role of indigenous peoples and their communities (UNCED, 1992b:Chapter 26.1). Chapter 26 of Agenda-21 also recognizes the interrelationship between the natural environment and its sustainable development and the cultural, social, economic and physical well being of indigenous peoples.

The Convention on Biological Diversity is also among the binding documents adopted at the 1992 Rio Conference and entered into force in 1993. The Convention was ratified by more than 150 states including Ethiopia. The Convention conceives biological diversity as the variability among living organisms from all sources including diversity within species, between species and of ecosystems. The major objectives of the Convention are:

- the conservation of biological diversity
- the sustainable use of its components, and
- the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

In its preamble, the Convention recognizes the close and traditional dependence of many indigenous peoples and local communities embodying traditional lifestyles on biological resources. Article 8(j) of the Convention refers to indigenous peoples and provides the following:

Each contracting party shall... respect, preserve, and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyle relevant for the conservation and sustainable use of biological diversity. . .

Generally, from the international instruments discussed above, it is clear that there are various rules and principles which are aimed at protecting our



environment and ensuring sustainable development. International documents related to local communities have clearly recognized their rights and interests. Particularly, ILO Convention 169 of 1989 provides clearly the rights of indigenous and tribal communities related mainly to their lands. But unfortunately, no African country is party to this Convention<sup>7</sup>.

International human rights documents also have recognized, directly or indirectly, the collective rights of local communities. In this regard, Article 27 of ICCPR can be mentioned. We have also various international environmental documents that reflect the interrelationship between the rights of local communities and protection of environment. Ethiopia actively participated in the drafting process of most of the international documents discussed above. It is also party to almost all those documents except the ILO Convention 169. For instance, Ethiopia signed and ratified the Convention on Biological Diversity on 10<sup>th</sup> June 1992 and 5<sup>th</sup> April 1994, respectively. It is to be noted that under the 1995 Ethiopian Constitution, international agreements signed and ratified by the government become part of the laws of the country.

#### **5.4 Federal laws and institutions related to natural resources and rights of local communities**

##### **5.4.1 General overview**

Ethiopia has a long history of forest legislation even if the more formal ones emerged during the reign of Emperor Menelik II. Since the time of Emperor Menelik II various forest legislations were enacted with the view to reduce the ever-increasing forest destruction. Many legislation, including detailed regulations were enacted during the regime of Emperor Haileselassie I. The ownership of forests was vested in the state and private individuals. Forests that were owned by groups of people were considered to be private forests.

After the 1974 Revolution, a socialist oriented government came to power and changed the primary forest legislation, by retaining many of the subordinate regulations to be operative in the new proclamation. The forest law of the socialist/military regime recognized three types of forest ownership; namely, state forests, peasant association forests and urban dwellers association forests. Both of the past regimes did not recognize community ownership forests *i.e.*, forests on territorial lands customarily occupied by indigenous peoples and their local communities.

Enactment of laws was unable to stop or even to reduce the destruction of forests in the country. As studies indicate, at the beginning of the 20<sup>th</sup>

---

<sup>7</sup> <http://www.ilo.org/indigenous/>

century a large section of the country's land was covered by natural forests. This has shrunk to not more than 2–3% of the country's total area nowadays.

At present, a federal arrangement is adopted in the country that has brought its own impacts on the legal and institutional set up of the forestry sector. Although not officially declared, the government organs and regional division of the country into federal type of order was started during the Transitional Government of Ethiopia which ruled the country from 1991 to 1995. In 1995 the Federal Democratic Republic of Ethiopia (FDRE) Constitution was adopted through the elected representatives of the Nations, Nationalities and Peoples of Ethiopia.

#### 5.4.2 Federal laws and policies

##### 5.4.2.1 *The FDRE constitution*

The Federal Constitution is the supreme law of the land in Ethiopia. As the result of this, any law of the country, customary practice or a decision of an organ of state or a public official which contravenes the Constitution shall be of no effect (FDRE Constitution 1995: Art. 9(1)). Since the Constitution is the higher law, all other laws need to be made in a way that they confirm the Constitution. Government officials must strictly obey the Constitution since they can act only within the bounds of their powers which are defined by the Constitution and by other laws of the country.

Constitutional laws normally guarantee rights and freedoms to the people and are, thus, considered as 'rights documents'. The Ethiopian Constitution is no exception in this regard. Especially, however, the FDRE Constitution emphasizes on the rights of Nations, Nationalities and Peoples. Some of the Nations, Nationalities or Peoples can be well taken as indigenous peoples and/or their local communities, as many of the Nations, Nationalities and Peoples of Ethiopia fulfill the definition of Indigenous Peoples as provided by the ILO Convention 169 of 1989, as discussed in the first part of this report.

Wide range of rights of indigenous peoples or Nations, Nationalities and Peoples are recognized under Article 39 of the FDRE Constitution. The rights which are relevant for this work are included in the first three sub articles of Article 39. They are read as follows:

##### *Article 39: Rights of Nations, Nationalities and Peoples*

1. Every Nation, Nationalities and Peoples has an unconditional right to self-determination including the right to secession.

2. Every Nation, Nationality and People in Ethiopia has the right to speak, to write and to develop its own language; to express, to develop and to promote its culture; and to preserve its history.
3. Every Nations, Nationality and Peoples in Ethiopia has the right to a full measure of self-government.

The right to self-determination, as recognized by the FDRE Constitution is a set of rights which includes: the right to a full measure of self-government, such as the right to establish institutions of government in the territory that the indigenous peoples inhabit; the right to equitable representation in the regional as well as the central government; the right to ecological self-determination, such as the right to manage the ecosystem using their traditional ecological knowledge (TEK); and the right to maintain their identity.

The FDRE Constitution has, as its national policy principles and objects, cultural objectives which impose duties on the Government to support the growth and enrichment of cultures and traditions that are compatible with fundamental rights, human dignity, democratic norms and ideals, and the provisions of the Constitution (FDRE Constitution 1995: Art. 91(1)).

This constitutional provision address the rights of Nations, Nationalities and peoples (indigenous communities) in promoting their cultures by imposing firm duties on the Government to work hard in supporting the growth, enrichment of cultures and traditions. The Constitution requires that the customs and traditions shall conform to fundamental rights, human dignity and democratic norms. It can be considered that such requirement is forwarded not to recognize those customs and traditions which are considered to be harmful practices. The rights of Nations, Nationalities and Peoples to ecological self-determination and customary management of nature are inalienable fundamental rights which would well conform to the human and democratic rights recognized by the FDRE Constitution.

The FDRE Constitution can be cited as a peculiar constitution in recognizing collective or group rights. A key characteristic generally ascribed to collective rights is the communal and solidaristic outlook of the peoples, which is recognized in Article 39(5) of the Constitution. It is now believed that such cultural and traditional rights are the sources for other rights like the right to development and environmental rights, which are guaranteed under Articles 43 and 44 of the FDRE Constitution, respectively.

In its provision of the right to development, the Constitution says that, “nationals have the right to participate in national development and, in particular, to be consulted with respect to policies and projects affecting their community.” (FDRE Constitution 1995: Art. 43(2)). Some development projects may cause the total or partial eviction of the local communities or

they may bring about other impacts on the livelihood of these communities. However, the Constitution guarantees these peoples' rights to be consulted. To be consulted means, the concerned communities should freely discuss on the matter, and shall be given the opportunity to decide freely to say 'yes' or 'no' regarding the project or the policy proposed by the government. This right of the communities imposes restrictions on the government officials or private project owners not to conduct any activity which did not get the blessing of the communities (Nations, Nationalities and Peoples/or the indigenous peoples and their local communities). This right is considered as one of the fundamental rights of the 'peoples' of Ethiopia. The other very important application of the cultural rights of indigenous peoples is their relationship with lands or territories.

Although Ethiopia is not a signatory of the Convention Concerning Indigenous and Tribal Peoples in Independent Countries (ILO Convention 169 of 1989), the FDRE Constitution recognized the major land rights of these peoples as they have appeared in the Convention. According to the FDRE Constitution, land is a common property of the Nations, Nationalities and Peoples of Ethiopia and shall not be subject to sale or to other means of exchange (FDRE Constitution 1995: Art. 40(3)). By this constitutional rule, land has become the common property of Nations, Nationalities and People of Ethiopia. This is the recognition of the communal ownership of land by the local communities. However, the Constitution does not give an exclusive ownership right to the Nations, Nationalities and Peoples. Instead, it provides for the co-ownership of land by the state and by the local communities of Ethiopia. Thus, the first limb of Art 40(3) of the Constitution prescribes that – the right to ownership of rural and urban land as well as of all natural resources is exclusively vested in the State and in the Peoples of Ethiopia. As the word "people" in this part of the Constitution is to mean the whole, it does not deny the land ownership right of Nations, Nationalities and Peoples of Ethiopia. Moreover, the term 'people' throughout the text of the FDRE Constitution is understood intersectionally as Nations, Nationalities and Peoples who are sovereign and own the Constitution itself.

The Constitution is a general law and it could be difficult to understand the specific modality of ownership of land by the State and by the Nations, Nationalities and Peoples of Ethiopia. But one important thing one can safely say is that, the FDRE Constitution has recognized the communal land ownership of the Nations, Nationalities and Peoples of Ethiopia. Further more, this Constitution highly emphasizes on the customary rights of the same. As various international human rights as well as environmental instruments recognize it, one of the cultural rights of local communities is the recognition of their attachment with land and territories. One of the international instruments states that 'indigenous peoples have the right to

maintain and strengthen their distinctive spiritual and material relationship with the lands, territories, waters and coastal seas and other resources which they have traditionally occupied or used, and to uphold their responsibilities to future generations in this regard (UN 1993: Para. 25–26)). Similar rights have been recognized under the ILO Convention. The ILO Convention 169 is a binding legal document at international level and rights in such legal instruments are argued to have already achieved the status of customary international law and are, therefore, legally binding except towards persistent objectors (Fergus 1998:3).

Ethiopia, even if it did not ratify such instruments, has never objected the respect of such rights. It even incorporated these rights in its Constitution. It can, therefore be argued that Ethiopia has a moral obligation to implement the indigenous rights enshrined, at least, in the ILO Convention. Moreover, Ethiopia is, at least, a party to the 1992 UN Convention on Biological Diversity, which incorporates provisions related to rights of indigenous and local communities to their environment. It is further believed that the right to development of these peoples or communities is linked with their land ownership right. In line with this, the Peoples of Ethiopia as a whole, and each Nation, Nationality and People in Ethiopia in particular have the right to improved living standards and to sustainable development. Nationals have the right to participate in national development and, in particular, to be consulted with respect to policies and projects affecting their community (UN 1993:Note 1, Art. 43 (1&2)). The right to development for traditional communities includes, (a) the right of access to resources on their territories, and (b) the right to seek development on their own terms (Posey 1999:513).

The above denotes that, under the guise of development activities or conservation works, the local communities shouldn't be denied the right to exploit local resources. In no case may a people be deprived of its own means of subsistence (Posey 1999). While exercising the right to development, the peoples concerned shall have the right to decide their own priorities for the process of development as it affects their lives, belief institutions and spiritual well-being and the lands they occupy or otherwise use, and to exercise control, to the extent possible, over their own economic, social and cultural development. In addition, they shall participate in the formulation, implementation and evaluation of plans and programs for national and regional development which may affect them directly (ILO 1989: Art. 7(1)). Experience shows that when traditional communities enjoy territorial security and freedom to make their own decisions, they tend to exercise their right to development in ways that provide long-term environmental benefits.

The recognition of collective ownership of communities over land by the FDRE Constitution has a remarkable significance in promoting the right to

sustainable development of such peoples or communities. The resource management knowledge of these people are collective and intergenerational. The relationship that existed between the indigenous peoples on the one hand and land and other natural resources on the other is not exploitative and based on respect and consideration. This is the main reason for the fact that indigenous and traditional peoples inhabit many of the areas of highest biological diversity on the planet, providing an inextricable link between biological and cultural diversity (Posey and Overall 1990:26). Ethiopia is no special case in this sense. Most of its virgin forests and biodiversity are inhabited by indigenous communities with diverse cultures. To maintain this situation for the indefinite future, it is a good step recognizing the cultural rights and communal land ownership of these communities.

#### 5.4.2.2 *Federal rural land administration and use law*

This is a recently enacted law (15 July 2005 as Proclamation No. 456/2005) which has prescribed important purposes in its preamble. Some of the statements in the preamble are:

- The exclusive ownership of land is vested in the state and the people;
- The necessity to conserve and develop natural resources and passing them over to the coming generations;
- Implementation of a sustainable rural landuse planning based on the different agro-ecological zones of the country.

These statements, as they are included in the preamble of the Proclamation, have no binding effect. They are simply showing the purposes why the legislature has given the law. As proclamations are statutes made under the constitution, they shall fully conform to the supreme law of the land, *i.e.*, the Constitution.

Although the FDRE Constitution has recognized the communal land ownership right of the Nations, Nationalities and Peoples of Ethiopia, both federal and regional laws did not address this very important right sufficiently and clearly. The Federal Rural Land Administration and Landuse Proclamation defines communal holding as “rural land which is given by the government to local residents for common grazing forestry and other social services” (FDRE 2005: Art. 2(12)). The Proclamation also defines state holding which is rural land demarcated and those lands to be demarcated in the future at federal or regional states holding; and includes forestlands, wildlife protected areas, state farms, mining lands, lakes, rivers and other rural lands (Ibid: Art. 2(13)).

As it is clearly indicated under Article 2(12) of the Federal Land Proclamation, it is the state that is giving rural land to local communities. This law seems to have set aside the constitutionally guaranteed land ownership of these communities. Under the Constitution, the State and the Nations, Nationalities and Peoples of Ethiopia own land. The Constitution did not give more right to the state than the Nations, Nationalities and Peoples. In the Constitution, state on the one hand and the communities on the other, have no unequal or unbalanced rights of land ownership. However, the Federal Rural Land Proclamation is enacted in the sense of denying the communal land ownership of the Nations, Nationalities and Peoples. It is untenable for a country that has recognized the right of these peoples to secede, if it denies their communal land ownership.

The Federal Rural Land Proclamation has failed even to consider communal land as it is prescribed under the ILO convention 169, in the territorial sense. According to the ILO Convention 169, the rights of ownership and possession of the peoples concerned over the lands which they traditionally occupy shall be recognized. Moreover, the rights of these communities to use lands not exclusively occupied by them, but to which they have traditionally had access for their subsistence and traditional activities must be respected. This is the territorial right of peoples, which is not merely restricted to the land which is occupied by them. It also includes rights over the landscape, mountains, rivers, etc. A close look to the provisions of the Federal Rural Land Proclamation clearly reflect that the land given by the government to the local communities for grazing, forestry and other social services is a fragmented land rather than a continuous territorial land.

Communal land ownership, which is recognized by the Constitution should not be interpreted to mean the fragmented and marginal lands<sup>8</sup> to be given by the government to the local communities. In line with this argument, we have to emphasize on Article 5(3) of the same Proclamation which says: "Government being the owner of rural land, communal rural land holdings can be changed to private holdings as may be necessary." The Amharic version of this provision appears to be more clear than the English one. It says that the government, if it deems necessary, can change communally owned or possessed lands into private possession, since the government is the owner of rural lands. By implication, this law has totally denied the constitutionally guaranteed land ownership right of Nations, Nationality and Peoples of Ethiopia. This is a clear contradiction with the Constitution and

---

<sup>8</sup> Article 13(9) of the Federal Rural Land Proclamation provides that: "Rural lands that have gullies and are located on hilly areas shall be rehabilitated and developed communally and as appropriate by private individuals." From this provision of the law, it can be understood that degraded lands, for the purpose of rehabilitating them, given to communal holding and taken away from communities and given to individuals once they have retained their fertility.

provisions of laws which contradict with the Constitution shall be null and void.

Such provisions of the law can be interpreted to the prejudice of the rights of land ownership/possession of the local communities. They may lead government officials and the local communities to believe that land is exclusively owned by the state, which is against the constitutional rule. The dangers in such beliefs are the lands in the hands of the local communities can easily be snatched for investment or other projects irrespective of the oppositions made by the communities.

#### *5.4.2.3 Federal Forestry Conservation, Development and Utilization Law*

This law was proclaimed as Proclamation No. 94/1994, before the coming into force of the FDRE Constitution, during the Transitional Period. The Proclamation is concerned about conservation, development and sustainable utilization of forests by recognizing their role in combating the grave and alarming situation in soil erosion and in arresting the expansion of desertification and ecological imbalance (FDRE 1994: Preamble). It also considers the contribution of forests for economic development of the country. It introduced new ideas which did not exist in forestry laws that precede it such as public participation in the forest management and utilization as well as benefit sharing for local communities (FDRE 1994: Preamble).

Three types of forest ownership are recognized – ‘state forest’, ‘regional forest’, and ‘private forest’. A state forest is a forest designated as state forest by a regulation to be issued by the Council of Ministers, up on the recommendation of the Ministry and that are given special consideration so as to protect the genetic resources or conserved to keep the ecosystem with a program that covers more than one region (FDRE 1994: Art. 2(6)). A State forest is the central government’s forest which is equivalent to the Federal State’s forest. The Proclamation points out that those forests which are ecologically very important and those which transcend regional boundaries would be designated as state forest (or forest of the central or federal government).

The problem with this provision is, no regulations have been made by the Council of Ministers to this effect and, therefore, no designation is conducted. As a result of this, it has become very difficult to identify which forests belong to the federal state and which ones would belong to the regional states. There is confusion on the side of the Ministry of Agriculture and Rural Development in administering state forests.



This confusion on the institutional set up of the forest management has been more aggravated after the adoption of the FDRE Constitution in 1995<sup>9</sup>. The Constitution was adopted while there were efforts to make regulations for the execution of Proclamation No. 94/1994. Since the adoption of the Constitution, confusions overwhelmed the federal institutions, which are empowered to administer forests. The main government department in charge of forests was the Ministry of Agriculture and Rural Development. But it almost ceased to play its role in administering forests since the adoption of the FDRE Constitution<sup>9</sup>. The FDRE Constitution has distinguished the roles of the federal and regional governments. The Federal Government is empowered to enact laws for the utilization and conservation of land and other natural resources, historical sites and objects, while the regional governments are empowered to administer land and other natural resources in accordance with Federal Laws (FDRE 1994: Note 1, Art. 51(5); 52(2)d).

The fact that the Constitution has given the power of administering land and other natural resources to the regional states, should not prohibit the ownership right of the Federal Government as far as forests are concerned. Even if the Constitution does not specifically indicate forests, it deals with rivers and lakes. It says: "The Federal Government shall determine and administer the utilization of the waters or rivers and lakes landing two or more States or crossing the boundaries of the national territorial jurisdiction (FDRE 1994:Art. 51(11)). As it is difficult to separately treat water, particularly rivers, from forests, the administration power of the Federal Government on rivers will have close link with the administration of forests.

As it is seen in reality, the Federal Government seems to have withdrawn from affairs of forests, except for providing technical and financial assistance, giving technological packages and making policies, laws and guidelines to the Regional States. Ethiopia is signatory of many international environmental instruments, and there are many tasks expected of the country (FRALAUP 2005: Note 21). According to experts, the Federal Government should not withdraw totally from administering forests, especially those critical and strategic for maintaining the ecological balance<sup>10</sup>. Moreover, those forests which link two or more regional states and those which cross the national boundary must be administered by the Federal Government<sup>10</sup>.

As it is observed from the practical work of the Ministry of Agriculture and Rural Development, there is no direct involvement in administering and managing the country's forests. It is the Ministry that is preparing the

---

<sup>9</sup> Interview with Ato Amare Work, Head, Forestry and Soil Conservation Department, Ministry of Agriculture and Rural Development, 27 October 2005.

<sup>10</sup> Interview with Ato Amare Work, Head, Forestry and Soil Conservation Department, Ministry of Agriculture and Rural Development, 27 October 2005.

Millennium Development Goals (MDG) of the forestry sector. However, it has no sufficient information about the status of forests, as it is functionally dissociated from the regional government institutions by the federal set up we now have<sup>10</sup>. Although there are efforts to create regular and uninterrupted relations with the regional government institutions, it is not still effective<sup>10</sup>.

As reports from field studies indicate the rate of deforestation has increased, especially in the years after 2001. Even the country report of Ethiopia indicates that new settlements in forests are increasing from time to time and resulting in the conversion of forested land into agricultural and other landuse system (Million 2001). At present, the few remaining high forests are threatened by pressure from investors who are converting the moist evergreen montane forests into other landuse systems such as coffee and tea plantations. The country report emphasized on the suffering of the forestry sector from lack of information and lack of coordination among the institutions which have a stake in the sector. It indicates that there have been fundamental changes in the forestry sector as a result of change from centralized to a market economy, decentralization of decision making and regionalization. As a result of these, ministries both at national and regional levels have been restructured which affected forest management (Million 2001).

Government forestry administration and management practices have been decentralized and the responsibilities to manage and administer forest resources have been devolved to the regional governments. They have little capacity to shoulder these challenging responsibilities and could not control deforestation (Million 2001). Institutions which are involved in natural resources conservation and development have had weak interaction and integration, which are necessary for the formulation of effective plans and strategies. Priorities, plans and strategies are formulated independently within the different sectors and are often conflicting (Million 2001).

At present many countries are engaged in processes towards decentralizing of their forest sector and this trend is increasing. However, decentralization may not be effective if it is made abruptly since it is a complex and dynamic process that includes constant learning and experimentation (SZA 2004:1). Decentralization needs to be phased in gradually and involves: building consensus through an open, transparent and inclusive process; participatory decision making; institutional, technical and human capacity building; provision of adequate financial resources and incentives for investment; tailoring objectives to local contexts and developing the flexibility to adapt to different situations and changing circumstances (SZA 2004).

Much has not been done in Ethiopia while the forest sector was decentralized. Even no clear laws, which specify the powers of the Federal

and Regional Governments, have been enacted. For instance, as indicated already, the Federal Forestry Proclamation provides for three types of forest ownership, namely: state forests, regional forests, and private forests (FDRE 1994: Note 16, Art. 3). State forests are the forests of the central or Federal Government. This law is not repealed. However, the regional forestry laws do not mention anything about the ownership of Federal or Government. Neither do they provide for the roles of the Federal Government as far as forest resources are concerned.

It is not clear why forestry is differently treated. Mining is one of the major natural resources. However, its administration is not totally transferred to the regional states. As prescribed under Mining Proclamation No. 52/1993, both the Federal and regional governments engage in regulating mining activities.

The forestry sector is also confronted by problems such as the reorganization of the forestry institutional systems. Over the past decades, there have been numerous restructuring of institutions related to forestry. There were separations and re-unification of the sector with agriculture several times. The natural resources sector has been formed at a level of ministry, vice ministry and at present at team level (FDRE 1994: Note 30).

Currently, the forest sector at a federal level has a lower organizational profile in the Ministry of Agriculture and Rural Development. Budget allocations and staff resources are often inadequate to monitor forest resources effectively and to ensure sustainable management. The trend towards decentralization and devolution of forest management responsibilities to the local governments could not be effective due to low capacity of the sector at all levels (FDRE 1994).

The problems in the forestry sector cannot be, however, attributed to decentralization alone. Rather, it is attributable to the system which is unable to create an effective decentralization. Well-structured decentralization of the forestry sector can foster local democracy and a sense of citizenship. Tailoring decentralization efforts to local contexts is a key element towards success. In many federal countries, powers are devolved to the regional governments, without reaching the local people. This cannot be taken as a real decentralization as far as forestry management is concerned.

Forestry in Ethiopia is also victim of lack of clarity and transparency. For instance, the federal forestry law provides for the powers of inspectors and forest guards. According to this law, forest inspectors and guards have the power to seize any forest product transported, or stored through prohibited activities (FDRE 1994: Note 16, Art. 14(2)). Before the enactment of this Proclamation and after its enactment, the forest inspectors and guards usually used check-points to facilitate their works. The existence of check-points facilitated their works. The existences of check-points have been

implied in the Proclamation, however, they were lifted by an unknown procedure.

One of the mechanisms of exercising the powers of forest guards and inspectors, especially to deter illegal trafficking in forest products, is by establishing check points at various sites in the country. Since the lifting of the check-point by unclear rules from the executive branch<sup>11</sup>, deformation has been more aggravated. A visit to the woodwork shops in Addis Ababa reveals that large quantity of timbers from trees whose harvest is prohibited by the forestry Proclamation.

#### Federal Environmental Impact Assessment Law

This law was proclaimed in 2002 as Proclamation No. 299/2002. It is one of the recently enacted environmental laws which brought big hopes in protecting the environment by correcting those projects which would seriously injure the environment and by rewarding those which are environment friendly. Environmental impact assessment is the methodology of identifying and evaluating in advance any effect, be it positive or negative, which results from the implementation of a proposed project or public instrument (FEIAP 2002). The Federal Environmental Protection Authority and the Regional Government Organ entrusted by the Region with a responsibility for the protection or regulation of the environment and natural resources<sup>12</sup> are mainly responsible to review the environmental impact study report prepared by the project owner or the investor.

The most important tasks of these Federal and Regional authorities are provided for in Article 9(2) of the Proclamation. The concerned body has, thus, the following activities to undertaken within 15 days as per Article 9(2) of the Proclamation:

- approve the project without conditions and issue authorization if it is convinced that the project will not cause negative impacts;
- approve the project and issue authorization with conditions that must be fulfilled in order to eliminate or reduce adverse impacts to insignificance if it is convinced that the negative impacts can be effectively countered, or
- refuse implementation of the project if it is convinced that the negative impacts cannot be satisfactorily avoided.

---

<sup>11</sup> It is not known from which authority the "directive" or the rule is given. It has become impossible to trace the origin of the directive since it is an oral instruction.

<sup>12</sup> Usually the Regional Environmental Protection and Land Administration and Utilization Authorities are responsible government organs in regions

The core principle of the environmental impact assessment law is the precautionary principle. According to this principle, the Federal or the Regional authority must make no mistake on the side of caution while determining the negative impact of a project having both beneficial and detrimental effects, but which, on balance, is only slightly or arguable beneficial (FEIAP 2002: Note 45, Art. 4(2)). This is to mean that when the proposed project has both positive and negative impacts and when the positive impact is only slightly greater than the negative impact, or when it is difficult to know how far the positive impacts exceed the negative impacts, the concerned authorities must decide on the side of protection of the environment. That is, they shall decide to refuse the implementation of the project, considering the project will have greater negative impacts as compared to its positive impacts.

When we assess the practice of reviewing the environmental impact study reports made by project owners or investors, less has been done. EPA is a very small office to conduct reviews on all environmental impact study reports under its jurisdiction. It does not have long tentacles to regulate each and every activity. In principle, reviewing of the environmental impact study reports developed by investors or project owners have to be done by the Authority in coordination with the regional authorities. However, EPA is unable to conduct the review process together with regional environmental protection authorities and federal sectoral organs<sup>13</sup>.

EPA decides on the environmental impact study report by simply trusting the project owner. It does not have mechanisms of ascertaining whether the report is correct or not. Moreover, once the approval is made, there is no way of knowing whether the investor or project owner is doing things in accordance with the terms of the permit<sup>13</sup>. As the government's interest now in Ethiopia is 'rapid development', EPA is unable to bring the agenda of environment in macro-level planning. It appears that 'rapid development' may be implemented even at the expense of the environment<sup>13</sup>. Even if the law provides for the concept of liability of a project owner for any injury his/her project causes to the environment, in practice this is totally absent. The law itself is not clear in this regard. Such problems could be solved by enacting specific regulations, directives and guidelines, which are non-existent at present, even if some efforts are being made to make EIA guidelines<sup>13</sup>.

Moreover, EIA is more of political than legal and it is observed that political decisions are made in many instances. At present EIA is seen as process introduced to act against development activities<sup>13</sup>. Such conception definitely leads to exploitative kind of relation between investment and nature. That is,

---

<sup>13</sup> Interview with Ato Solomon Kebede, Head, Department of EIA, EPA, on 7 October 2005.

the existing system facilitates “only taking from nature” type of relationship. What should have been done is ‘give and take’ relation, which requires investing on nature itself. This would facilitate more and more investment opportunities in the future, while exploitative kind of approach will end up in a degraded and devastated environment, which is against sustainable development. Sustainable development is one of the constitutionally guaranteed fundamental rights of individuals as well as groups.

The Proclamation sets a wonderful procedure for presenting the environmental impact study report. Hence, “without authorization from the Authority or from the relevant regional environmental agency, no person shall commence implementation of any project that requires environmental impact assessment as determined in a directive issued pursuant to Article 5”<sup>14</sup> of this Proclamation. Moreover, “any licensing agency shall, prior to issuing an investment permit or a trade or an operation license for any project, ensure that the Authority or the relevant regional environmental agency has authorized its implementation” (FEIAP 2002: Note 45, Art. 3(1), (3)).

Projects required to produce EIA shall prepare the environmental impact study report and present it to the EPA or the regional environmental agency before they start operation. Licensing agencies, such as investment offices, before they issue licenses to projects they must ensure that EPA or the relevant regional environmental agency has approved the environmental impact study report of the project. This important procedure is designed to protect the environment from possible negative impacts. That is, if the project is allowed to commence operation before EIA study is presented to EPA or the relevant regional environmental agency, there is a chance that the project could cause negative impact on the environment. Such risks are avoided by a procedure that requires the presentation of the EIA study and getting the authorization to commence operation.

While the EIA Proclamation is still effective and without its formal amendment, the Investment (Amendment) Proclamation No. 375/2003, enacted nearly a year after the EIA Proclamation, has reversed this very important procedure. According to Proclamation No. 375/2003, the Ethiopian Investment Commission or the Regional Investment Bureau (or the appropriate investment organ) shall, after issuing the investment permit, notify the concerned government institutions so that the latter conduct the necessary follow up (FIAP 2003:Art. 2). According to this newly introduced procedure, the investor or project owner does not need to go to EPA or the regional environmental organ to get authorization to commence operation.

---

<sup>14</sup>Not all projects need to produce EIA documents. Only those projects likely to have negative impacts require EIA.

What he/she is expected to do is, just applying to the appropriate investment organ to get the license. The appropriate investment organ issues the license without considering the EIA requirement. The license holder can commence operation without fulfilling the requirements of EIA. What the appropriate investment organ does is notifying EPA or the regional environmental agency the fact that it has issued a license that enables the investor to commence operation.

As it has been discussed earlier, EPA has no capacity to conduct follow-ups owing to its financial, technical, human and institutional weaknesses. The reason for reversing the procedure is indicated in a general manner in the preamble of Proclamation No. 375/2003. It is to make the system of administration of investment transparent and efficient (Ibid Preamble). Moreover, the change in procedure is introduced for reason that EPA and the regional environmental agency have never denied permit so far and it was considered that such a procedure was pointless. It was a mere hurdle for investment and hence its removal was suggested, and new procedure was finally introduced<sup>15</sup>.

It is true that investment projects are very crucial for economic development of a country. The purpose of this work is not to bluntly oppose to investment activities. Its aim, however, is to show that, unless due concern is given to environmental issues it is not possible to have investment projects in a sustainable manner. Moreover, EIA is one of the manifestation of local democracy, since it requires public participation on the proposed project, before such project starts operation.

Legally speaking, the provisions of the EIA Proclamation, which require the investor or the project owner to develop EIA and present it to EPA or the relevant regional environmental agency before he/she commences operation is repealed by the Investment (Amendment) Proclamation No. 375/2003. But this does not mean that EIA is not required at all. After starting operation, the investor may prepare if he/she is asked by EPA or the regional environmental agency. As it has been observed from field work, no such activity has been made by the EPA or the regional environmental agencies. Even if they have the intention to do so, their intuitional capacity will not allow them.

The recently enacted Penal Code of May 8, 2005 prescribes that “any person who implements any project before fulfilling the EIA requirements and before getting the authorization of the appropriate organ, shall be penalized by imprisonment not exceeding one year” (PCFDRE 2004: Art. 521)<sup>16</sup>. The Penal Code has reversed the revised procedure and now presenting EIA to

---

<sup>15</sup> Interview with Ato Tekalign Taddese.

<sup>16</sup> Translation mine

EPA or the regional environmental agency getting authorization from these organs, before commencing operation is mandatory to the investor or project owner. Irrespective of the Penal Code's rule, the appropriate investment organs continued issuing licenses without requiring EIA documents from investors.

#### Federal Government Policies on Environment and Forest

Ethiopia adopted its Environmental Policy in 1997. The Policy tries to deal with environmental issues by setting: policy goals, objectives and guiding principles, sectoral and cross-sectoral environmental policies, and policy implementation.

One of the policy objectives is to 'conserve, develop, sustainably manage and support Ethiopia's rich diverse cultural heritage (FDRE 1997: Section 2.2(9)). This is a pervasive objective which catches many things such as the culture of conserving nature, through various customary practices, for instance, maintaining sacred places and customary rules of forest management. The other policy objective is ensuring the empowerment and participation of the people and their organizations at all levels in environmental management activities (FDRE 1997: Section 2.2(h)). This is a good policy objective which is designed to foster democracy and decentralization at the local community level. Implementing this policy objective requires strong legal and institutional framework that effectively works at the grassroots level. This policy objective is supported by a sectoral policy of genetic, species and ecosystem biodiversity. This sector has the policy of promoting the involvement of local communities inside and outside protected areas in the planning and management of such areas (Ibid: Section 3.3(f)).

This is one of rights of the local communities which needs the attention of government officials, investors, project owners and other stakeholders. Peoples' participation in the planning and management of their environment has to be considered as the expression of their sovereignty. It is impossible to respect their rights of self-determination and self-government without recognizing their right to decide on their environment.

Ethiopia does not have a formally adopted forest policy. It has only Draft Forest Policy. The Draft Forest Policy, which was on the table for long, has not still been adopted. One of the policy statements relevant for this work is the one that provides for the foresting development and protection activities which will be carried out with the participation of the people and the benefit sharing scheme for the people from the forest development.

The benefits indicated in the draft forest policy are minimal. They are employment opportunities, collection of dry wood, cutting and harvesting



grasses and hosting beehives. The policy has not considered the cultural and spiritual values of the local communities for forests and forestlands and their special relation with forests.

## 5.5 Regional State Laws and Institutions

### 5.5.1 The SNNPR Rural Land Administration and Utilization Law

This law, which is cited as Proclamation No.53/2003, is enacted pursuant to the Federal Rural Land Administration Proclamation No. 89/1997, which is repealed by the recent Proclamation No. 456/2005. The Proclamation begins with a very good and attractive preamble that includes:

- Transferring land to the coming generations;
- Keeping the balance of natural resources;
- Participating users of rural land for sustainable development;
- Giving security of land possession for rural landusers; and
- Ensuring women's land possession and use right without any undue influence.

As one can clearly understand from these statements of the preamble of the Proclamation, this law has the purpose of considering the present generation as trustee of land not just owner of land. Acting as trustee to land is extremely important as far as the rights of the coming generations and sustainable utilization of land is concerned.

According to the rules of trusteeship of land, the value of land must be maintained at the same level as when ownership/possession right is vested (Bernard 1999:41). This means that all projects must be planned and executed in a way that will not degrade the land as it is reflected in the preamble. It is on this line that the SNNP Regional State Land Administration Proclamation is made. But as preamble of a law has no binding force, it is the main body of the law that matters most.

The Proclamation deals with distribution of land which is defined as distributing **unoccupied land** to those who do not have and to farmers who have insufficient land (SNNPR 2003: Art. 2(14)). This provision goes with the respect of the rights of people who want to lead their life as farmers to get land freely. This is a constitutionally guaranteed right.

The Proclamation does not encourage new land distribution and re-allocation unless it fulfills requirements like ensuring productivity, acceptance by the public, support by study, etc.( SNNPR 2003: Art. 12(1)). Even if Article 12(1) of the Proclamation does not encourage re-distribution of land, it has been weakened by sub-article 2 of the same Article. According to sub-article 2,

unoccupied land which is suitable for farming; ... as well as lands under the possession of government with potential for agriculture shall be distributed to landless individuals, farmers who have scarcity of farm land, investors, and willing settlers of the region. Articles 2(14) and 12(2) have some built-in dangers, since it did not prescribe any exception, unlike the Oromiya Forest Proclamation. The Forest Proclamation of Oromiya, No. 72/2003 in its Article 14(1) (b) rules that 'it is prohibited to clear the forest resources in order to plant coffee, chat (*Catha edulis*), and practice agricultural activities, ...' The Oromiya Forest Proclamation, thus, ensures that forest resources shall not be cleared for agricultural practices. This means, unoccupied forestlands will not be allocated for those who have no land or insufficient land. The terms 'unoccupied land' under the SNNP Proclamation includes forestlands while the Oromiya Proclamation excludes forestlands.

The SNNP Land Administration Proclamation also recognizes a communal holding which is defined as, "land out of government or individual possessions and is being under the common use of the local community as common holding for grazing, forest and other social services" (SNNPR 2003: Note 64, Art. 2(16)). This is a good provision which recognizes the possibility of communal land holding. However, the problem with this provision is the fact that all communal holdings are lands which are outside the government holding. Government holding is -land demarcated and held and could be held by government and includes large forestlands, wild animals, parks, mining, lakes and rivers (SNNPR 2003: Art. 2(17)).

Almost all important lands are held by government and the communal holdings, in this sense, must be those fragmented lands, except for the pastoralist lands, which are used by the local communities for various purposes. This is far from communal land ownership right recognized by the FDRE Constitution and the international instruments including the ILO Convention 169. That is, the SNNP Land Administration Proclamation does not consider the territorial concept of land ownership by the local communities.

The Oromiya Rural Landuse and Administration Proclamation No 56/2002 recognizes the communal land ownership right of the local communities better than that of the SNNP rural land law. According to the Oromiya land law, the customary right of access to land in using communally for grazing, ritual ceremonies and public uses shall be maintained both for farmers and pastoralists. Thus, in case of the Oromiya land law, under the guise of "unoccupied" land, which is being used by local communities for customary rituals may not be taken away from them, even if such land is very big forestland. Although it is difficult to know at present how far this provision is implemented in Oromiya Regional State, having the law itself is a good step. Local communities may use hills, mountains, rivers, and large forests

for ritual ceremonies and it seems that this right of the communities is recognized by the Oromiya Landuse and Administration Proclamation.

Regarding land lease to investment or other activities is concerned, the SNNP Land Administration Proclamation gives powers to the government to lease land only when economic and social benefits prevail and in a manner that does not affect the ecosystem (SNNPR 2003: Art. 17(1)). Accordingly, land can only be leased and given to the investor or another lessee when it is economically and socially advantageous, determining which, requires a detailed study of the economic as well as social consequences of leasing land to investment or other projects.

The Proclamation provides for the proper landuse by any person who possesses land for various uses. In particular investors are obliged to use land based on the landuse plan. The development proposal to be submitted by the investors to use the land shall be based on landuse plan which entails that the use should not disturb environmental security, should be economically viable and socially acceptable (SNNPR 2003: Art. 17(2)). So long as an investor complies with the landuse plan, and fulfills the conservation requirements set by law, he/she may qualify even to be given lands which are occupied by farmers, high forests, historical and religious places, etc. (SNNPR 2003: Art. 17(2), (3)). This rule may tempt investors to go for high forests, farmers' lands and other religious and historical places. The problem is not merely giving such lands to investors; it is the failure to conduct follow-ups by the concerned government organs to check whether these requirements are fulfilled or not. As observed in the field, the concerned government offices make no strict follow-ups.

The Proclamation further declares that the investor is duty bound not to use more than the land given to him by the contract and not to perform out of the development plan permitted for him (SNNPR 2003: Art. 17(4)). Nevertheless, as discussed in various parts of this work, investors are not restricted to the lands which are given to them by a contract. Usually, they transgress beyond their demarcated boundaries.

### 5.5.2 The SNNPR Forest Management, Development and Utilization Law

Like the Federal Forestry Law, this law (Proclamation No. 77/2004) is also concerned about the ecosystem, and emphasizes on public participation on forest development and forest management as well as the benefit sharing schemes for the people (SNNPR 2004: Preamble). The Agriculture and Natural Resources Development Bureau is in charge of the Region's forests (SNNPR 2004: Art. 2(2)). Any forest that is not private and listed as state-

owned forest by the Region's official gazette belongs to the Regional State (SNNPR 2004: Art. 2(4)). The Region has not described any of the forests as "Regional forests" in the official newspaper. However, as the Proclamation limited the types of forest ownership only to Regional State and private individuals (groups), all forests which are not owned privately can be designated as forests of the Regional State (SNNPR 2004: Art. 4).

The Proclamation does not consider communal forest ownerships which are treated separately from private forests. The Oromia Forest Proclamation (ORS 2003), unlike its counterpart of the SNNP Regional State, provides for three types of forest ownership. These are: State Forest, Private Forest and Community Forest.

A community forest is a state forest where user right and management responsibility is transferred to organized local communities or where the forest is developed by organized communities on communal land (ORS 2003: Art. 2(6)). Unlike the Federal and the Southern Region Forestry laws, the Oromiya law recognizes community forests which are different from private forests. The Oromiya law has, even if not in a sufficiently clear manner, incorporated the constitutional sense of communal ownership of natural resources, which is also acknowledged by the international instruments including the ILO Convention. The Oromiya laws are better suited in recognizing and respecting the rights of local communities as far as the rights in managing, developing and utilizing natural resources are concerned.

The SNNP forestry law, in relation to issuance of forest and forest products license, provides that 'a license shall be given to individuals, who are interested in engaging in woodworks, based on the supply and resource of forest products' (SNNPR 2004: Art. 15(2)). This rule is provided as a method of implementation of sustainable forest use. It is based on the regenerative capacity of forests in relation to their harvest. The rule is aimed at limiting harvest not to exceed the general regenerative capacity of forests. However, this rule has never been realized actually. In SNNP Regional State the Trade and Industry Bureau issues licenses irrespective of the objections posed by the Regional Agriculture and Natural Resources Development Bureau<sup>17</sup>. There is little co-ordination and concerted effort to halt environmental degradation. The agriculture department alone cannot do anything, unless all governmental offices co-operate for the effective implementation of the law.

The Officers at the Trade and Industry Bureau of the Region do not deny the allegation of the Agriculture and Natural Resources Development Bureau. They admit that they issue licenses to wood work firms without necessarily

---

<sup>17</sup> Interview with experts in Regional Bureau of Agri. and Natural Resources Development, Awassa, on September 5, 2005.

considering the abundance and availability of forest resources. They said: "Even if we do not issue licenses, there is no mechanism of containing the proliferation of woodwork firms in the Region. Having noted the existence of quite a lot of woodwork firms without licenses, we decided to issue licenses. It is not this Office that should control deforestation, but the Agricultural Bureau, which we inform to follow-up after issuing licenses."<sup>18</sup> Experts from the Agricultural Bureau state that they have limited capacity and it is difficult to stop all illegal activities on the forests. They state that "the ones who are issued licenses and those who do not have licenses mainly get timber illegally. Timber smugglers usually carry firearms. Our supervisors are unarmed. There are instances where they shoot down our inspectors"<sup>18</sup>. Instructions have been passed to the Police Department to seize any illegal forest products. We are experts and we cannot stop illegal movement of the forest products."<sup>18</sup>

The police officials accept that there is high level of illegal actions on forests of the Region. Timber is transported by various means such as on animal back and donkey carts, among others. The smugglers use these means to avoid the risk of being caught. The police can control all illegal activities in the Region. However, they say they can not move to seize illegal movements of timbers, unless they get information from the Agricultural Bureau, who come with such information only occasionally. They state that they have checkpoints at various places to control the illegal movements of firearms or other weapons, but no checkpoints for controlling forest products<sup>19</sup>.

## 5.6 Local institutional and legal framework

### 5.6.1 General background of Sheka Zone<sup>20</sup>

Sheka Zone is located in SW part of Ethiopia (some 650 km away from Addis Ababa). The total land area of the Zone is 217,526.29 hectares out of which, 30,557.62 hectares are cultivated, 102,661.22 hectares forestland, 3,944.73 grazing land, and 10,122.85 hectares bush land. According to a publication of the Sheka Zone Administration Office, 34% of the land has potential for various aspects of development.

### 5.6.2 Local institutional framework in Sheka Zone

Sheka Administrative Zone is one among the thirteen Zones and eight Special *woredas* of Southern Nations Nationalities and Peoples Regional

<sup>18</sup> Interview with an expert in Regional Bureau of Trade and Industry, Awassa, 06/09/05

<sup>19</sup> Interview with Senior Inspector, Taddele Wariyo, Police Department, Awasa, 06/09/05

<sup>20</sup> The information in this section is taken from the Sheka Zone Bulletin prepared in Amharic and named 'Maritu' Issue 1, No.1, 1997 E.C and 'Shekana Getsebereketuwa' 1996 E.C.

State (SNNPRS). It borders in North and Northwest with Oromiya; in East with Kefa Zone; in Southwest with Gamblla Regional State; and in South with Bench-Maji Zone.

Structurally, the Sheka Zone has three *woredas* namely, Masha, Yeki and Andracha. There are seven urban *kebeles* and 56 rural *kebeles*. At zonal level, the Sheka Zonal Administrative Council has various departments under it for implementation of legal policies and programs of the government. It is important here, to assess the institutional framework within which issues of natural resources protection operate both at zonal and *woreda* levels.

#### 5.6.2.1 *Relevant institutions in the zonal administration*

There are various institutions (offices) at zonal level in Sheka relevant to the issues at hand related to natural resources management. These mainly refer to:<sup>21</sup>

- Zonal Administration Council (ZAC)
- Zonal Department of Rural Development (ZDRD)
- Zonal Department of Trade, Industry and Urban Development (ZDTIUD)

The Sheka Zonal Administration Council (ZAC) has a direct relation with both the Regional Government and the *Woreda* Administration in the Zone. It has a general supervisory role over various departments of the executives under it and the *Woreda* executives. It is important to take note, at this juncture, that there is no legislative council at zonal level, within the new structure introduced by the Regional Revised Constitution. Rather, the zonal level of administration constitutes the Executive Council and its various departments<sup>23</sup>. The departments are meant to coordinate the activities in the Zone. It is also important to take also note that the zonal administration is financially dependent on the *Woreda* Councils in the Zone. However, the zonal administration has the important power, such as power to decide on issues of allocating lands for investors<sup>22</sup>.

The *Woreda* Representative Council and Administration have no role in the allocation of lands for investors<sup>23</sup> who have investment permit from the Regional Investment Bureau. The Zonal Administration also plays an important role in assisting/supporting sectoral offices at *woreda* level. This is mainly in providing trained human power and also in organizing training programs.

---

<sup>21</sup> Discussion with Acting Chairman of Shak ZAC, 2005.

<sup>22</sup> Interview with Zonal DTIUD Head, 2005.

<sup>23</sup> Discussion with Deputy Chairman of the Masha *Woreda* Council, 2005

Sectoral departments under the Zonal administration also play various roles. There are some zonal departments that play relevant roles in resource management and use. Department of Public Participation Affairs (ZDPPA) of Sheka Zone, for instance, works on enhancing participation of the people of Sheka Zone in development efforts of the government. According to ZDPPA head, in relation to resource management, the department plays a role in resolving conflict between investors and local communities<sup>24</sup>. But it seems that there is no well organized and effective participation of the people in the Zone, mainly in the area of getting consent of the people and decision-making in allocating land to investors. In this regard, the Department Head of ZDPAA has agreed that “although investment has a significant role in advancing development efforts in the Zone, there is a need to asses problem and damages that come with the investment process”<sup>25</sup>.

The Zonal Department of Rural Development (ZDRD) is also another important office at zonal level that plays a key role in natural resources management in Sheka Zone. According to our discussion with the department head, the department has structurally more than five desks including the ‘Agriculture and Natural Resource Development Desk’ and ‘Land Administration and Environmental Protection Desk’. Institutionally, the department is under the Zonal Administration and is at the same time accountable to the line sectoral bureaus of the Regional Government<sup>26</sup>.

The Agricultural and Natural Resource Development Desk of the Department has some sections such as ‘natural resources unit’, ‘livestock development unit’, and ‘crops development unit’. Though the Department has a desk responsible in the administration of land and protection of environment, it has no power of allocating land to investors. The major responsibility of ZDRD, in this regard, is to undertake studies on the suitability of land for investment<sup>28</sup>. Thus, whatever happens on the land given to investors, the Department has no role once the land is given to investors. Accordingly to the Head of the Department, since 1996, they have undertaken a study in which they describe<sup>27</sup>:

- suitability of the land in terms of different investments;
- whether the land is part of forestland under protection; and to a degree some ecological characteristics of the land.

The other relevant Zonal Department is the Department of Trade, Industry and Urban Development (ZDTIUD). This Department has several desks one

<sup>24</sup> Discussion with the Head in Masha, 2005

<sup>25</sup> The Head of ZDPPA, Ato Befikadu has said this in his message published in the Sheka Zone Bulletin named ‘Shekana Getsebereketuwa’, 1996 E.C. Masha, p. 9

<sup>26</sup> Discussion with ZDRD Head, Masha, 2005

<sup>27</sup> Discussion with Heads of ZDRD and ZDTIUD, Masha, 2005

of which is Investment Desk. The Department, mainly through its Investment Desk, is responsible for facilitating investment activities in the Zone. It also provides information and various services to investors interested to invest in the Zone<sup>28</sup>. In addition, the Investment Desk supervises and follows up the activities of investors<sup>29</sup>. Nevertheless, the Department has no power to issue investment license, which is responsibility of the Regional Investment Bureau.

ZDTIUD concludes agreement with investors and hands over land to them once investors have permit from the Zonal Administration. Overall, the steps and procedures provided for investment are:

- Regional Investment Bureau issues license;
- Zonal Administration gives permission for the plot of land; and
- ZDTIUD concludes agreement with the investors and hands over the land to investors.

An important question is: "what constitute the terms of agreement concluded between the Department and investors?" In the agreement they sign, investors enter into various obligations. According to the Head of ZDTIUD, the following are among the major obligations of investors<sup>31</sup>. First, investors agree to fully develop the land given to them within four years. Second, the investor agrees not to transfer his rights and duties to others before he fully develops the land. Third, the investor has various duties related to environmental protection. But, it is unfortunate that an EIA study is neither required from the investor nor is there any provision for it to be undertaken by some sector<sup>31</sup>. Moreover, investors are duty bound not to use the natural resources on their land without authorization and are liable to pay to the government for what they use out of the natural resources.

#### 5.6.2.2 *Relevant institutions at woreda level*

As per the Revised Constitution of the Regional State, important powers of government have been devolved to the grass-root level, mainly to the *woreda* level. The devolution of power by the Regional Revised Constitution is designed to ensure the active participation of the local people in the development and democratization processes. Thus, the *Woredas* have financial autonomy which makes the Zonal institutions to be financially dependent upon them.

As already mentioned, the Sheka Zone has three *woredas* namely: Masha, Yeki and Andracha. The *Woreda* level government structure has all the three organs - legislative council, executive council/cabinet and courts. The legislative council is responsible for the preparation and approval of budget

---

<sup>28</sup> Discussion with Head of ZDTIUD, Masha, 2005

<sup>29</sup> Discussion with Head of ZDTIUD, Masha, 2005



to be submitted to the Regional Government. It is also responsible for adopting the social, economic policies and programs of the *Woreda* in line with the National and Regional policies and programs (see Revised Constitution of SNNPRs).

The *Woreda* Executive Council (*Woreda* Administration) plays an active role in resource management and use at *woreda* level. The Masha *Woreda*, for instance, which is one of the three *woredas*, has 19 rural and 2 urban Kebeles. Its administration has seven sectoral offices that are members of the *woreda* cabinet<sup>30</sup>. The administration provides the overall coordination and supervision of the activities of various offices under it. With regard to resource management, its responsibilities are limited to implementing the decisions of the Zonal Administration<sup>31</sup>. The major activities are undertaken by the sectoral offices of the administration. With regard to its role on investment activities in the *woreda*, its major responsibility is mainly to provide security and protections to investors against any act that might hamper their activities<sup>32</sup>.

Among the offices under the *Woreda* Administration, the Rural Development Office plays key role with regard to resources management. As the Zonal Office, this Office also has four major desks/teams,<sup>32</sup> namely:

- Agriculture and Natural Resources Development Desk/Team;
- Cooperatives Affairs Desk/Team;
- Water Resources Development Desk/Team; and
- Agricultural Inputs Service Desk.

Through the relevant desk/team, the Office of Rural Development is mainly responsible, (as far as natural resources are concerned) in educating the people and raising awareness on protection of the environment and natural resources<sup>33</sup>. Through its agriculture and natural resources development desk, the Office also works on re-forestation to a limited extent. The re-forestation activities are minimal because there are limited deforested lands in its *woreda*<sup>35</sup>.

There are also efforts of the Office in cooperation with the *Woreda* Administration and Zonal line departments to put some kind of demarcation of state forests in Masha *Woreda*. Thus, according to the *Woreda* Deputy Chairman, approximately some 10,000 hectares of state forestland in four

<sup>30</sup> Interview with Masha *Woreda* Council Deputy Chairman, 2005.

<sup>31</sup> Discussion with Masha *Woreda* Council Deputy Chairman and Head of Masha *Woreda* Rural Development Office, 2005.

<sup>32</sup> Take note that these office names are not the official names.

<sup>33</sup> Discussion with the Head of Masha *Woreda* Office of Rural Development, 2005

rural *kebeles* have been ‘demarcated’. During the field visit for this study, we, however, observed that the said ‘demarcation’ was only putting a notice board along the road informing the public that the area is state forestland.

### 5.6.3 Laws and Their Enforcement in Sheka Zone

As already seen in the previous sub-section of this report, the institutional framework at local level for sustainable use and protection of natural resources is not efficient. For instance, the power given to the Zonal Administration Council to allocate land to investors does not seem appropriate at least from the perspective of proper natural resources management. This issue may raise the questions such as why this power is denied to the *woreda* level administration. Is it not against the principle of decentralization introduced by the Revised Regional Constitution? Relevant institutions such as the Zonal Department of Rural Development (ZDRD) have no significant role in the decision to give land to investors. Even though there is a desk for land administration and environmental protection under ZDRD, its only role is to study the suitability of the land for the specific investment.

As we have seen, the Revised Constitution of the Regional State devolves power to the grass-root level, mainly to *woreda* level state administration. Thus, substantial power is given to the *woredas* including autonomy in allocating and using their annual budget. It is, however, a paradox to deny this level of state administration closer to the local community (in practice) to have a say in the decision on land allocation to investors. In almost all the local institutions in Sheka Zone, there is acute shortage of skilled manpower<sup>34</sup>. According to some of the officials we met in Masha, one may find a department/office with only one person- its head/chairman. Related to this, is the frequent restructuring of local institutions. This is seriously hampering their efficiency and effectiveness in enforcing laws and policies of the government. In this regard, the Ethiopian National Report on Implementation of the Convention on Biological Diversity has already recognized that:

The frequent organizational restructuring of the administration of forestry sector and the inadequate capacity at all levels of administration and management are among the major constraints in the development of forestry in Ethiopia (Million 2001).<sup>35</sup>

Though the forest legislations – both Federal and Regional – require classifications of forestlands with maps and demarcation (FDRE 1994; SNNPR 2004), no such classification has so far been made to the forestlands in

---

<sup>34</sup> Discussion with the Chairman of Sheka Zone Administration Council, Masha, 2005.

<sup>35</sup> Accessed on Sept 15, 2005

Sheka Zone. The local experts and officials know generally what they call *Ye Mengist Den* which means state forest, and no more can say the exact area designated as state forest.

Moreover, the spontaneous and unplanned landuse system is one of the major problems related to implementation of laws on natural resources use and management in Sheka Zone. This is irrespective of the fact that the rural land administration law of the Regional State requires the preparation of 'landuse plan' in the Region (see Article 14(1) of Regional Proclamation No. 53/2003). In fact, for land to be given to investors, there is some prior study and preparation in Sheka Zone since 2004.<sup>36</sup> However, this study is by no means comprehensive.

Article 17(1) of the same law provides that 'the development proposal to be submitted by investors to use the land shall be based on landuse plan, which means, not disrupting environmental security, being economically viable and socially acceptable'. There are two important issues that need to be addressed here. First, in practice, there is no proposal required of investors so long as they obtain their investment licenses from the Regional Investment Bureau. Second, there is no landuse plan prepared based on the Regional Rural Land Administration Law. These make meaningless the requirement under this law from investors to manage land and its natural resources, which is a source of serious problems. The Head of the Zonal Department of Public Participation Affairs (ZDPPA) in this regard said that 'there are problems of proper handling of natural resources on the land that investors get in lease (SZA 2004:19).

Moreover, it is important to assess the practice in Sheka Zone in light of Article 17(3) of the Regional Rural Land Administration Proclamation. This Article provides the following:

"Unless it is based on the provisions of sub-article 1 of this article and article 14 (1) and (2) of this Proclamation, lands which are the possession by peasants, parks, forest, areas which are demarcated for natural resources development and protection by government, historical and religious places, and other holdings intended for public services shall not be given to investors."

The above provision of the law excludes the possibilities of giving lands listed in it to investors. Thus, the following land holdings are excluded from being allocated to investors:

1. lands under the possessions of farmers,
2. lands designated as parks,
3. forestlands,

---

<sup>36</sup> Discussion with the Sheka Zone Officials, Masha 2005

4. lands demarcated by the government for natural resources development and protection,
5. lands designated as historical and religious places, and
6. other holdings intended for public services (the Amharic version of this is: *Le Hizb Agelgilot Ye Tasebu*).

Then how is this law implemented in Sheka Zone? In practice, the Zonal Department of Trade, Industry and Urban Development (ZDTIUD) has focused mainly on two important issues. That is, making sure that the land intended to be given to investors is not under possessions of farmers, and that the land is not part of forestlands. Since there is no clearly demarcated forestland in Sheka Zone, land is allocated to investors by mere physical observation without properly checking whether it is forestland or not.<sup>37</sup> In the absence of clear land use plan that identify and register the various land use system designated as ‘protected forest’, ‘historical place’, ‘religious place’, etc., it is very hard to ensure the enforcement of the provisions of laws. In practice, these issues get little concern from local government institutions and officials.

The way the East African Tea Plantation was given land for investment best explains how issues such as interest of the people, exclusion of ‘forestlands’, ‘historical and religious places’, etc., have been neglected in providing land to investors. The continuing conflicts between the investors and the local communities in Sheka Zone are clear reflections of this and lack of adequate and genuine consent of local community to the investment.<sup>38</sup> Moreover, the Regional Rural Land Administration Law provides that ‘any investor is duty bound not to use more than the land given to him by the contract, and not to perform out of the development plan permitted for him’ (see Article 17(4) of Proclamation No. 53/2003). In practice, however, the local community and most of the local officials raised their concerns over problems of expanding land possession by investors beyond the land given to them, in addition to their failure to develop the land as per the terms of agreement (SZA 2004:19).

Within the local institutional framework, ZDTIUD is responsible to supervise and control over the activities of investors. That is why it enters into agreement with investors. However, there is no effective control over investors and their activities<sup>39</sup> which is highly contributory to the failure of investors to be up to the terms of the agreements. Shortage of skilled manpower, the newly introduced restructure in the Zone, etc., are indicated as major reasons for lack of effective control. According to the Head of

---

<sup>37</sup> Even the study said to be made is not efficient and genuine according to most of the local experts

<sup>38</sup> Zonal Bulletin p. 19; Interview with local officials; The Reporter: Weekly News Issue 10, No. 84/558, 29 Nehase 1997 p. 20

<sup>39</sup> Interview with the Head of ZDTIUD, 2005

ZDTIUD, there were even circumstances in which investors approached the Department after they had developed the land and started production.

Generally, there are several problems for effective implementation of laws and policies at local level in Sheka Zone. Key among the major problems at local level is the delegation of responsibility i.e., the fusion and confusion as to who does what in Sheka Zone. One best example in this regard is the issue of who is responsible to exercise control over investors in Sheka Zone. Land Administration and Environmental Protection Authority of the Region is responsible for the execution of the Regional Rural Land Administration Law. This Authority is constituted as a desk at zonal and *woreda* levels under Rural Development Office (RDO). Thus, by virtue of the provisions of the Regional Rural Land Administration Law (RRLAL), RDOs can have some legal power and duty to exercise over investors. However, since it is, in practice, the ZDTIUD that deals with investors, RDOs – both at zonal and *woreda* levels – have no role in this regard. Thus, there is a need to clarify this kind of fusion and confusion of powers among local institutions.

## 5.7 Recommendations

1. Revisiting the institutional structure for forestry sector and clearly defining forest policy should be an urgent solution. The weak forest sector institutions at all levels need to be strengthened both in human and financial resources. An effort should be exerted to bring about sense of cooperation rather than competition among the various sectoral institutions. Landuse policy and plan with the objective of ensuring a sustainable allocation of land between sectors should be adopted urgently. Strategic landuse planning agency should also be established both at Federal and Regional levels.
2. Though the FDRE Constitution and various international documents recognize the rights of local communities to their land and natural resources, almost all other primary and subordinate laws of the government are not in line with such rights guaranteed in the Constitution and international legal instruments. Therefore, there is a need to revise those laws in a way that is compatible with the Constitution and ensures the rights of local communities to their land and environment.
3. Ensuring local democracy is one of the goals set by the FDRE Constitution. Though there are some efforts to devolve power to the grass-root level, enough has not been done so far, particularly, with regard to natural resource management. In line with the constitutional

right to participation, the responsibility for forest management needs to be devolved to local communities and local institutions.

4. Ethiopia has adopted a constitution that provides a lot of collective rights to local communities. In fact, it even goes far beyond what are provided by international legal documents. But it is unfortunate that Ethiopia has failed to be member to some of the important international agreements such as ILO Convention on Rights of Indigenous Peoples. Thus, there is a need for Ethiopia to sign and ratify those conventions, mainly, the 1989 ILO Convention No 169. Moreover, Ethiopia must comply with the provisions of those international legal documents related to the protection of environment and rights of local communities.
5. Laws in this country are not only in conflict with its 'basic law' – the Constitution, but also within related laws, which creates serious confusion during implementation. The conflicts between the EIA law, Investment law and the Penal Code provisions can be mentioned as examples. Thus, there is a need to rectify such conflicting positions of the Ethiopian laws.
6. Others:
  - Improving the efficiency of existing forest industries and encouraging them to be plantation-based;
  - Preparing a management plan for the remaining forests with full participation of the local communities;
  - Agricultural/farm forests, which are major sources of fuelwood and construction material, should be promoted; and
  - Provision of alternative energy sources needs to be developed and enhanced in the locality.

## 5.8 Reference

- Bernard, D. (1999), *Environmental Law for All: A Practical Guide for the Business Community, the Planning Professions, Environmentalists, and Lawyers*, Impact Books, Pretoria.
- Critescu, A. (1981)., *The Rights to Self-Determination: Historical and Current Development on the Basis of UN Instruments*, E/CN4/Sub2/404/Rev.1.
- FDRE (1994). *Federal Forestry Conservation, Development, and Utilization Proclamation No. 94/1994*.
- FDRE (1995). *FDRE Constitution*, Federal Negarit Gazeta, 1<sup>st</sup> Year, No.1, 1995.
- FDRE (1997). *Environmental Policy of the FDR Ethiopia*.
- FDRE (2002). *Federal Environmental Impact Assessment Proclamation no. 200/2002*
- FDRE (2003). *Federal Investment (Amendment) Proclamation no. 375/2003*.

- FDRE (2004). Criminal Code of the Federal Democratic Republic of Ethiopia Proclamation no. 414/2004.
- FDRE (2005). Federal Rural Land Administration and Use Proclamation no. 456/2005
- Fergus, M. (1998). *From Concept to Design: Creating an International Environmental Ombudsperson*, The Nautilus Institute for Security and Sustainable Development, California.
- Galenkamp, M. (1993). Individualism versus Collectivism: The Concept of Collective Rights. Munch Museum, Oslo, p. 49.
- ILO (1989). Convention on the Protection of the Status of Indigenous and Tribal Peoples in Independent Countries. ILO Convention 169.
- Maritu, a Bulletin on Investment. Annual Bulletin, Issue 1, No.1, 1997 E.C. Sheka Zonal Administration, SNNRP.
- Million Bekele (2001). Ethiopia: Country report. Forestry Outlook Studies in Africa, FAO. Available at <http://www.fao.org/docrep/004/ab582e/ab582e02.htm>, accessed on September 15 and 28, 2005.
- OAU (1981) African Charter on Human and Peoples' Rights, 1981 18<sup>th</sup> Assembly of the Heads of State, Nairobi, Kenya.
- ORS (2003). Oromiya Forest Proclamation №No.72/2003. Oromiya Regional State, Ethiopia.
- Posey, D.A. and Overall, W. (eds) (1990)., *Ethnobiology: Implications and Applications: Proceedings of the First International Congress of Ethnobiology. Volume 1*, MPEG/CNPQ/ MCT, Belem.
- Posey, D.A. (1999), *Cultural and Spiritual Values of Biodiversity*, UNEP, Intermediate Technology Publications Guildford, UK.
- SNNPR (2003). SNNPR.
- SNNPR (2004). SNNPR Forest Management, Development and Utilization Proclamation No. 77/2004.
- SZA (2004). Decentralization, Federal Systems in Forestry and National Forest Programs: Report of a workshop co-organized by the Governments of Indonesia and Switzerland, "The Interlaken Workshop", 27-30 April 2004.
- The Reporter: Weekly News in Ethiopia, Issue 10, No. 84/558, Nehase 29, 1997 E.C
- UN (1948). UN Universal Declaration of Human Rights.
- UN (1966) International Covenant on Civil and Political Rights.
- UN (1966) International Covenant on Economic, Social, and Cultural Rights.
- UN (1993). UN Draft Declaration on the Rights of Indigenous Peoples, United Nations, New York.
- UNCED (1992a). Convention on Biological Diversity, the Rio Declaration on Environment and Development. UN Document.
- UNCED (1992b). *Agenda-21: Program of Action for Sustainable Development*, UN Doc: DPI/1344/Rev.1/SD. (1992)
- UNESCO (1978). Declaration on Race and Racial Prejudice.
- UNHRC (1993). UN Draft Declaration on the Rights of Indigenous Rural Land Administration and Utilization Proclamation No. 53/2003Peoples.





## 6 Economic value of afro-montane natural forest in Sheka Zone, southwest Ethiopia

Aseffa Seyoum

### 6.1 Summary

This study attempts to provide an estimated value of Sheka Forest considering forest products, environmental and ecological services for a better understanding of the value of the natural forest. In particular, the paper tries to identify and describe the various use and non-use values of the natural forest, estimate its economic value and indicate possible interventions. For the purpose of this study, both primary and secondary data were required. Primary data were collected from the study area through focus group discussion, key informant survey, and household survey using semi-structured questionnaire, while secondary data were collected from relevant zonal and district offices in the study area and from previous studies.

Ethnic composition of sampled households was 82 per cent Sheka, followed by Oromo 7 per cent, and Kaffa (about 5 per cent) while Amhara, and other ethnic groups such as Sidama constituted the rest 6 per cent. Regarding educational level of household heads, about 13 per cent had secondary level, while about 46 per cent had primary education. Household heads with basic education made about 38 per cent of the sampled households. The rest of sampled household heads were illiterate (about 3 per cent). Most of the sampled household heads were Protestant-Christians (52 per cent) while the remaining 47 per cent and 1 per cent belonged to Orthodox-Christians and other religion, respectively. Sixty-nine per cent of the sampled households were native to the area. Livestock holding is one of the wealth ranking criteria in the area. Among sampled households about 10 per cent did not own any cattle. Besides, 17 per cent of the sampled households did not have small ruminants at all. The computed average values indicated ownership of about one ox and two cows per household for the sampled respondents. This implied that the local households based considerable portion of their livelihood form natural forest.

Direct use value of the natural forest for house construction, furniture, utensils, farm implements and for fencing purposes was estimated to be Birr 89 per ha per annum. The other common non-timber forest products identified were honey, forest coffee, spices, bamboo, fuelwood and charcoal, and others such as palm and wild fruits. The value of these non-timber forest

products were estimated to vary from about Birr 1,192 per hectare based on current extraction level to Birr 8,142.13 per hectare under exploitation of the potential of the natural forest with zero management. On average, sampled households generated about 44 per cent of their income from forest and forest products.

It was estimated that, under sustainable extraction and proper management, the natural bamboo forest could bring benefits amounting from Birr 542 to 813 million per annum. Apart from this, Sheka natural forest has immense indirect use value. For instance, its carbon storage value was estimated to be about Birr 2 billion and cost of conversion of this natural forest to perennial crop plantation, in terms of carbon release was estimated to be about Birr 3,400 to 17,425 per ha. Moreover, the total non-use value of natural forest was found to be about Birr 15.19 per hectare, which implies around Birr 1.5 million per annum. Generally, conservation under traditional use system with minimum or zero management of Sheka natural forest is estimated to have a total average economic value of Birr 10,572 per hectare per annum. The use value of the natural forest in the form of non-timber forest products alone under this traditional production system was found to be about two fold of the net benefits from land allocated to investment in tea plantation.

Nevertheless, conservation of Sheka Forest should not be seen in terms of its economic benefit alone but also on ethical grounds. It is a moral issue to keep the natural forest for the coming generation, although the current generation also has the right to use the natural forest. This is because there are some economic, cultural, environmental, and ecological services that should not be valued by this generation alone. Therefore, it is important to develop management strategy that balances conservation and development goals through promotion of eco-friendly activities, participatory conservation, sufficient benefit sharing mechanism for the communities for their participation in conservation and with recognition of customary forest tenure rights.

## **6.2 Introduction**

Sheka natural forest provides a wide range of benefits. It is a rich ecosystem that offers not only economic and social services to the local people but also environmental and ecological services to different stakeholders at national and global level. Nevertheless, this benefit has not been well documented, as most of the goods and services delivered by the natural forest are non-traded and many others are generated off-site and are not properly acknowledged. As a result, the pristine natural forest is being converted to other landuses, which will generate directly marketable products. This includes

smallholders' agricultural land expansion and large-scale commercialized private farms. It is to be noted that crop production is an important component of smallholders' livelihood while commercialized agriculture is also an input to accelerate development. Nevertheless, this should not come through the destruction of natural forests and loss of biodiversity as the latter is irreversible. Deforestation of natural forest for investment is known to have adverse socio-economic, environmental and ecological effects, which will end up with high opportunity cost of development.

There are studies that attempted to estimate the benefits of the natural forest based on non-timber forest products value (Tamene Tiruneh and Legesse Tafa 2004; Wubalem Tadesse and Getachew Dessalegn 2004; Mohammed Adilo *et al.* 2006). Estimation of non-timber forest product benefits can be an indicator of its contribution to household and national income, although it may constitute just a small portion of natural forest benefits. Natural forests have several indirect national and global values, too.

This study was conducted to provide a general estimation of the value of the natural forest taking into account forest products and environmental and ecological services for better informed decision. In particular, the paper attempts to identify and describe the various use and non-use values of Sheka Forest, estimate the economic value of the natural forest and then indicate possible interventions.

### 6.2.1 Background of the study

There is global concern over the fate of the tropical rainforests and the people who depend on them as, on average, 60% of tropical forests have been destroyed (Cernea and Soltau 1998). Ethiopia shares the problem with other tropical countries. The country has lost most of its forest cover. In particular, the study area, Sheka Forest, is facing serious encroachment from commercialized perennial crop production like tea and coffee plantation, which is currently becoming an important threat to the ecosystem.

There are studies on the type of plant resources in natural forests of different parts of the country (Demel Teketay *et al.* 2000). These conclude existence of plants of high economic and social values to the local community, the nation as well as to the globe. Nevertheless, the economic value of Ethiopian forests are often overlooked, although they are sources of fruits, medicinal plants, spices, coffee, kororima, ginger, gum and incense, honey, bamboo, firewood, building materials in addition to their ecological functions and services. Households in many parts of southwest Ethiopia are highly dependent on forests for their daily existence and livelihoods by harvesting fruits, coffee, spices and other products (Mohammed Adilo *et al.* 2004).

Thus, degradation of natural forest and environmental deterioration has greater negative impact on livelihood of the local people living in or adjacent the area in addition to its global effect.

To date, natural forest covers only about 3.5 per cent of the total area of the country. Forest and woodland coverage in the country is shrinking mainly by the action of small holders, which own 95 per cent of cultivated land. Out of the remaining 2.4 per cent of high forests, 45 per cent face pressure from expansion of agriculture (Shibru Tedla and Kifle Lamma 1999). The problem is serious in the case of state forest resources due to low enforcement capacity of formal institutions and breakdown of indigenous institutions that were used to regulate resource utilization. This leads to open-access regime and resource degradation. Inappropriate policy intervention such as national investment policy and market liberalization may also lead to an overexploitation of natural resources unless implemented with care.

Currently, there is a lot of "argument" regarding allocation of natural forest to private investment for perennial crop production. Some argue that the investment creates employment and technology transfer opportunity for local people through which rural development can be promoted. Others argue that use and non-use value of the natural forest that the local people used to get from natural forests outweighs, by far, the benefits from investment. Moreover, they argue that some of the externalities of commercialized investments are irreversible (*e.g.*, biodiversity loss). Thus, they suggest the need to opt for other possible mechanisms that can preserve the value of the natural forest without hindering the desired rural development.

This lack of consensus is, perhaps, due to the limited understanding of the value of natural forests. Detailed study on economic value of natural forests in Ethiopia is scant. Therefore, estimation of economic value of Sheka natural forest is hoped to give baseline information which may serve as an input in showing its value for informed decision making and to advocate for its conservation. Moreover, this study suggests other possible mechanisms to enhance sustainable natural forest conservation and rural development in the area. It may also help as a stepping-stone for further detailed research to reveal the value of Sheka natural forest.

### 6.2.2 The setting

The study was conducted in Sheka Zone, Southwestern Ethiopia, which is located about 676 km from Addis Ababa. It is divided into three districts namely Masha, Anderacha and Yeki, which are more or less of similar socio-economic characteristics. The zonal area coverage is 217,526 ha, out

of which about 47.2 per cent is a natural forest area. The area stretches over an altitudinal range between 900 to 2700 m above sea level with a mountainous climate. About 56 per cent of the Zone is highland, while 24 and 20 per cent of the Zone belongs to mid-altitude and lowlands, respectively. The area receives rain for about 9 months with average annual rainfall of 1800–2200 mm while the annual mean temperature is around 21–29°C (Anonymous, 2005).

Sheka Zone is inhabited with peoples of different ethnic groups such as Shakicho, Oromo and Amhara. The population of the area is 160,204, out of which 95 per cent is rural dweller while the rest 5 per cent is urban (CSA, 2003). The average family size is about 5 persons per household. It is estimated that there are about 32,005 agricultural households in the area. This means, on average, there is about 0.31 household that depends on a hectare of natural forest. The people meet their subsistence from the natural forest, predominantly through non-timber forest products and hunting. Recently the area is being encroached by large scale agriculture. There is also informal land marketing in the area such as sharecropping, renting and contracting. Contracting is usually an informal type of land sale in the area which is a common means to buy forestland for hanging beehives and non-timber forest product extraction activities. It is estimated that over 125,000 traditional beehives are available in the Zone with an annual production of about half to one million kg of honey.

### 6.2.3 Purpose and objectives of the study

The main purpose of the study was to identify the various values of the Sheka Forest and to depict the benefits of the natural forest in a comprehensive manner so that it may help in decision-making regarding the management and use of the natural forest. Specifically, the study was designed to address the following objectives:

- To identify and describe the different direct and indirect use value as well as non-use (option, bequest and existence) values of the natural forest;
- To estimate the economic value of the natural forest in the study area;
- To compare non-timber forest products value with benefits from investment after complete removal of forest;
- To provide an insight and overview of the livelihood system of the local people and their dependency on the natural forest in the study area;
- To suggest possible intervention mechanisms that may enable sustainable conservation of the natural forest to maintain its

economic value on the one hand and enhance rural development in the area, on the other hand.

#### 6.2.4 Scope and limitation of the study

This study attempted to estimate both the use and non-use values of the natural forest in the study area. But, the major challenge was to get economic value of non-use benefits of the natural forest. Given the time, resource, and data constraints the scope of this study was limited to forwarding the general and comprehensive benefits and values, which might not be very detailed and accurate in case of some indirect and non-use values. Further detail and interdisciplinary research work is needed to arrive at more accurate indirect and non-use values of the natural forest particularly that of soil nutrient conservation benefits and medicinal plant and biodiversity values. Nevertheless, it is hoped that the results of this study will provide important information on the overall benefits of the natural forest.

### 6.3 Literatures review

#### 6.3.1 An overview of forest conservation and rural livelihood in Ethiopia

In Ethiopia, the most important forest areas were grouped into 58 National Forest Priority Areas (NFPAs) for management purposes in the 1980s. In 1993, there was a total area of about 4.8 million ha delineated as NFPAs. However, this did help stop the destruction and extinction of forest areas. Currently, emphasis is being given and different approaches of conservation such as participatory forest management (PFM), establishment of protected areas or parks are being attempted. PFM provides an exclusive property right group of people or community over a patch of forests. A study by Tsegaye Bekele *et al.* (2004) indicated that the approach is a successful means of reducing the level of forest degradation.

Hundreds of millions of people, mostly in developing countries, derive a significant part of their subsistence needs and income out of gathered plant and animal products from natural forest. The livelihoods of many people in Ethiopia also depend directly or indirectly on forests. Several factors such as distance of household's homestead to the patch of forest, income, household size, and education level of household head have significant influence on the level of dependency of households on forests (Aseffa Seyoum 2005).

Tamene Tiruneh and Legesse Tafa (2004) identified the relationship between rural livelihoods and non-timber forest product collection. Livelihoods are the access that individuals or households have to different types of capital (natural, physical, human, financial and social), opportunities and services

(Ellis 2000). The study of Tamene Tiruneh and Legesse Tafa was based on data collected through PRA and sample survey. The result of descriptive analysis of the study revealed that the livelihoods of the local people were highly dependent in one way or another on natural forest. Particularly, NTFPs like honey, forest coffee, spices and bamboo were identified as most important means of livelihoods. Moreover, the study identified that level of extraction of forest product is related to socio-economic characteristics of household and resource embodied in a patch of forest. Existences of NTFPs certification potentials were also identified as an important mechanism to enhance their contribution to the livelihood of local people as well as means to achieve sustainable conservation (Taye Bekele 2003).

### 6.3.2 Economic value and valuation techniques for natural resources

Most environmental economics literatures (*e.g.*, Rosales *et al.* 2005; SCBD, 2001) consider economic value of natural resource as use and non-use value. Use value includes goods and services of use to human population while the rest of the values fall under non-use category. Other studies like Spaninks and Beukering (1997) take out option value of natural resource, which is considered as non-use value in previous studies, as separate component of economic value.

Valuation of natural resource in monetary terms is a recent practice in environmental economics. Nevertheless, significant progresses have been made towards valuation of environmental goods and services. Various case studies have considered different range of economic value components and arrived at different value results. There are also review works done by Spaninks and Beukering (1997) and Sheil and Wunder (2002) on valuation techniques and strength and limitations based on various studies conducted. These works revealed that studies for forest valuation differ in a range of benefits from forests taken into account, valuation techniques applied, the underlying assumptions made regarding a given ecosystem and landuse conversion (which will absolutely change the economic value of the ecosystem) and noted that forest valuation should be continued and promoted with care.

There is also a study by the secretariat of the Convention of Biological Diversity (2001) that assessed the different studies conducted in different nations. This review showed that different valuation techniques result in different values of ecosystem and suggested appropriate valuation techniques for the various forest goods and services. Accordingly, production function approach, in which the market prices are used for marketable timber and non-timber forest products have been suggested while

either contingent valuation or choice modeling were suggested for the other public forest goods and services.

Recently, attempts are being made to attach direct value or market values to all environmental benefits. For instance, Mills (2002) considered the case of conservation concession payment made in Guyana to estimate biodiversity conservation value of that forest.

## 6.4 Methodology

### 6.4.1 Sampling techniques

The three districts of Sheka Zone were generally found to be similar based on forest type, livelihood system and dependency on forest. Then, a stratified random sampling technique was adopted to select respondents from purposely identified districts. In order to prepare and stratify the sample frame, first discussion was made with the staff of NTFP project with different background (foresters and marketing specialists) to categorize the different *kebeles* into honey and forest coffee based, bamboo based and spices based areas. This discussion was supplemented with discussion made with experts of Sheka Zonal Agriculture and Rural Development Office.

Once the sample frame was identified based on FGD, key informant survey and reconnaissance survey were undertaken in Masha and Anderacha districts. Further quantification of some parameters was done in Masha district. Sample units for formal survey were selected randomly using the probability proportional to sample size technique based on the number of farm households in each PA, so that, each sample unit has equal chances of being selected. The sample units in the formal survey were farm households who live in the vicinity to or in the natural forest. A total of 74 sample respondents were interviewed during the formal survey, out of which, only complete information from 71 households was analyzed for the study (Table 6.1).

**Table 6.1 Sampled kebeles and sample size drawn from each**

<i>Kebeles</i>	No. sample hhs	Per cent
Wello-Shoba	15	21.1
Uwa	16	22.5
Keja	16	22.5
Beto	15	21.1
Gada	9	12.7
Total	71	100.0



### 6.4.2 Data collection

For the purpose of this study, both primary and secondary data were required. Primary data were collected from the study area through focus group discussion, key informant survey, and interview using semi-structured questionnaire at household level.

Focus Group Discussion (FGD) is an important instrument in order to get full ideas of participants on a given issue, which is the drawback of structured questionnaire. A well facilitated FGD enables participants to share knowledge, correct one another and minimize the error that a single respondent may make if enquired alone on the issues under study. With this logic, focus group discussion were undertaken in Yakochichi and Domi *Kebeles* of Anderacha district, and Wello-Shoba, Uwa, Keja, Beto and Gada *Kebeles* of Masha district. The participants of the focus group discussion were from different categories of the society such as elderly peoples, traditional healers and *kebele* officials (Appendix 4). Facilitators of the discussion were the researcher and one translator based on a checklist prepared beforehand.

Key informants survey was also used to generate information from experts or subject matter specialists on issues under study. These include concerned staffs of non-timber forest product research and development project, Anderacha and Masha districts rural development coordination office, Zonal investment office, elderly peoples and traditional healers. The key informant survey was conducted according to the guideline checklist prepared for this purpose.

Lastly, in order to quantify the information generated through FGD and key informants survey, it was found important to undertake formal survey. In January 2006, formal survey was conducted using semi-structured questionnaire in Amharic. Quantitative data on socio-economic characteristics at farm household level and other relevant information in relation to the natural forest were collected.

### 6.4.3 Theoretical and empirical approaches

Total economic value (TEV) is a concept used to identify and quantify the comprehensive net benefits of natural resources depending on available data. Based on TEV theoretical framework, the economic value of a given forest is categorized as use and non-use values (SCBD 2001; Merlo and Croitoru 2005):

$$TEV = UV + NUV$$

$$TEV = DV + IDV + OV + BV + XV$$

Where *TEV* = Total economic value of natural forest

$UV$  = Use-value of the natural forest  
 $NUV$  = Non-use value of the natural forest  
 $DV$  = Direct use benefit of natural forest  
 $IDV$  = Indirect use benefit of natural forest  
 $QV$  = Option value of natural forest  
 $BV$  = Bequest value of natural forest  
 $XV$  = Existence value of natural forest

The above mathematical setting indicates that the use value can be further classified, as direct and indirect use values and the non-use values into option, bequest and existence values. Option value can be, sometimes, treated separately as an intermediate value of natural forest between use and non-use value. A measurement of total economic values of the natural forest refers to the monetary value that individuals generate as use value and the amount that stakeholders are willing to pay for non-use value of the natural forest if it were to remain as before the intervention. According to welfare theory, the compensating surplus measures the willingness to pay (WTP) a specified change in forest condition to remain the same as before. The WTP is non-negative for economic goods. For economic goods consumers are willing to pay a specified annual amount in a given 'payment vehicle'. For instance, in higher taxes to protect each value of forest and maintain benefit from it.

Based on the theoretical framework, this study employed a mixture of estimation approaches to arrive at the economic value. Following SCBD (2001) and Richard *et al.* (2003) the details of the TEV is indicated in Table 6.2. Actually, these values are highly interrelated. It was difficult, if not impossible, to get the exact value of all the benefit of the ecosystem to the stakeholders at all levels. The study, nevertheless, attempted so far as possible to identify and value most benefits to indicate good proximate value of the natural forest. Some of the economic values of the natural forest were estimated on per household bases while others were captured on per hectare bases. TFPs and NTFPs benefits from the survey results that were obtained at household level were converted to per hectare bases, based on estimated number of households depending on that natural forest.

Direct use value comprises both consumptive and non-consumptive benefits that the local people derive from the forest resources. For direct use values that have market, benefits were estimated at market price while the value of best substitute goods were used to value non-marketable use value of the natural forest. In case of some direct uses of the forest, it was not appropriate to depend on benefits generated by the local peoples to indicate its economic value. For instance, in the case of forest coffee and spices, there is unused huge potential. In this case, it was found better to base the value estimation

on sustainable extractive level<sup>1</sup> of the resource. For durable forest products such as doors, windows, furniture and utensils a straight-line depreciation method<sup>2</sup> was employed to arrive at the annual value of the natural forest to households.

**Table 6.2. Summary of possible categories of economic value and valuation techniques**

values	Further classification of EV	More specific benefits	valuation Techniques
Use value	Direct use	Consumptive or Extractive use	Timber, NTFPs (wild fruits, spices, honey etc.) grazing, hunting
		Non-consumptive	Tourism, wildlife, cultural, educational
	Indirect use	Environmental services/functions	Watershed protection, flood preservation, micro-climate regulation, soil conservation, carbon storage
Non-use value	Option value	Personal future benefit, or Maintaining stock	Opportunities in terms of biodiversity, medicinal plant, unused landscape, carbon storage
	Bequest value	Benefit for future generation	Keeping forest intact for future generation, landscape, recreation, energy/raw material available
	Existence value	Intrinsic value, Value from knowledge of existence	Aesthetic beauty, resection of right of non-human being species in the ecosystem

Indirect use value refers to the benefits that the local people currently derive from the ecosystems which is non-extractive. Forest provides many indirect use services to different stakeholders that have no market value. Thus, one has to go for other evaluation techniques like price of close substitute goods and services, cost of harvest, replacement cost, barter game or willingness to pay. In application of substitute price technique, commodities used as substitutes were taken which were accessible at least cost to most households that depended on the goods and services to be valued. Besides, estimation of some other indirect use values of the natural forest was based on the results from previous studies.

<sup>1</sup> Sustainable extraction level of the forest product is the extraction level of the products without causing harm to ecological equilibrium while ecological equilibrium refers to the methods and rates of resource extraction to its carrying capacity which maintain sustainable use of the resources (Terefe Degefa 2004).

<sup>2</sup> This is a method in which annual depreciation is computed to estimate its 'annual value' assuming that it is used to replace it after a given period of time (Gittinger 1982).

Non-use value refers to the values that people attach to the benefits of natural resource value not in use. Although some of these have started to enter the global market, there is no market value for them in our country. For valuation of these non-use forest products, stated preference approach is selected. Stated preference can be either Choice Modeling (CM) or Contingent Valuation (CV) method. CV method is a well developed and extensively used procedure in forest valuation context (Goodwin *et al.* 1993; Kramer *et al.* 1995; Spaninks and Beukering 1997; Zilberman 2000; Sekar and Chandrasekaram 2001; SCBD 2001; Kewak *et al.* 2003). In this method, first the desired non-use goods or services and products which do not have market value are identified and described; then respondents are asked whether they are willing to pay and specify the amount. This is a questionnaire-based procedure in which individuals are asked to respond to attitudinal questions about the forest goods and services.

There are different forms of CV techniques such as single bid and iterative bid. Once again, for this purpose, iterative bid, in which the respondents were first asked whether s/he would pay Birr x for the situation of good described, and then asked to arrive at the maximum amount s/he would be willing to pay for. Then, the respondents were informed the total amount s/he decided to pay and permitted to confirm the distribution made among the different environmental services. On the other hand, costless choice may also be used for some situation or environmental value. In this case a respondent is expected to choose between a given amount of money and a bundle of environmental good until the respondent chooses the environmental good. It implies the minimum value of environmental good to that individual (Sekar and Chandrasekaram 2001). Lastly, these mixed valuation of goods and services of the natural forest was followed by subsequent aggregation to arrive at total economic value of the natural forest.

#### 6.4.4 Methods of analysis

To meet the above mentioned objectives descriptive statistics were employed. TEV was obtained as the sum of component values of each forest product. The data analysis process was handled using the Statistical Package for Social Science (SPSS) software.

### 6.5 Result and discussion

There are several use and non-use benefits that the local people and stakeholders at different level generate from Sheka Forest. These benefits are

identified and estimated values are presented in the following consecutive sections. Moreover, the socio-economic characteristics of households are expected to determine value of natural forest to the local people and its extraction level as well as their perception towards conservation. Hence, these are discussed in the next section as a point of departure.

#### 6.5.1 Socio-economic characteristics of sampled households

Household characteristics and endowment of the natural forest determine the dependency level of the local people and the economic value of the natural forest to stakeholders at different level. Most of the sampled households (82 per cent) were Sheka, followed by Oromo (7 per cent), and Kaffa (about 5 per cent) while Amhara, and other ethnic groups such as Sidama constituted the rest 6 per cent. As to the level of education, most of the sampled household heads (46 per cent) had primary level of education. Household heads with basic education made about 38 per cent of the sampled households. The rest of the sampled household heads were illiterate (about 3 per cent) and at secondary level of education (about 13 per cent). Taking the household members aged 15 to 64 as actively working group (Bielli *et al.* 2001), the age composition of the sampled household indicated that each person in working age must bear the burden of another one to two persons who are either younger than 15 or older than 64 years.

Religion is another important factor that determines farm households' perception towards natural forest conservation. It also affects the total economic value component that the household generates from the natural forest such as cultural value. Out of the sampled households the largest portion were protestant-Christians making 52 per cent, while the remaining 47 per cent and 1 per cent belonged to orthodox-Christians and other religion in that order. Besides, being native to the area or not has impact on households' perception towards conservation and socio-economic value. The survey result revealed that 69 per cent of the sampled households were native to the area whereas the rest 31 per cent were in-migrants from other parts of the country, on average, about 27 years ago.

The most important wealth indicators in the study area are livestock, landholding especially that of enset and forest coffee, and number of bee colonies owned. The wealth of household is also among many other factors affecting level of dependency of rural household on natural forest (Ferraro 2001). Among sampled households, about 10 per cent did not own any cattle. Moreover, 17 per cent of the households did not have small ruminants at all. The computed average values indicate existence of about one ox and two caws per household for the sampled respondents. The average monetary value of total livestock asset holding was estimated to be Birr 5,694.00 per sampled household, at local market price. Regarding farmland, cereals

covered the largest portion followed by enset and pulses (for detail see Table 6.3). The average landholding of sampled household in the study area was about 2.7 hectares.<sup>3</sup>

**Table 6.3 Socio-economic characteristics of sampled household**

HH head characteristics	Number	%	HH characteristics	Mean	S.D.
<b>Ethnic group</b>			dependency ratio	1.66	1.28
Oromo	5	7.0			
Sheka	58	81.7			
Amhara	2	2.8	<b>Assets owned</b>		
Kaffa	4	5.6	oxen per household	1.26	1.06
Other	2	2.8	cow per household	2.27	2.08
<b>Education level</b>			other cattle*	3.59	1.38
illiterate	2	2.8	small ruminants	2.86	1.55
Basic edu.	27	38.0	pack animals	0.59	1.12
elementary	33	46.5			
high school	9	12.7			
<b>Religion</b>			<b>Land holding and allocation (in <i>timad</i>)</b>		
orthodox	33	46.5	forest coffee	0.13	0.955
protestant	37	52.1	cultivated coffee**	0.26	0.62
other	1	1.4	<i>enset</i>	2.85	1.27
<b>HH head born here</b>			cereal	5.86	1.11
yes	49	69.0	pulse	2.13	0.87
No	22	31.0	other crop***	0.081	0.81
<b>Marital status</b>			fallowed land	1.94	2.81
single	13	18.3	forestland****	3.85	2.18
married	52	73.2	total land	16.36	9.19
divorce	1	1.4			
widow	5	7.0			

Source: own field survey, 2005; \* includes heifers, young bulls and calves; \*\* includes plantation and garden coffee; \*\*\* includes chat & spices; \*\*\*\* encompasses grazing, non-grazing & bamboo.

In the study area, three kinds of forestland tenure systems were identified: state, communal and private<sup>4</sup> forestland. Forest tenure and its management system is an important factor that has either adverse or positive impact on its conservation (Agrawal and Östrom 2001). The survey result indicated that only 38 per cent of sampled households had private plot(s) of forestland, while 64 per cent had communal forestland where the community members have exclusive property right to a given patch of forest. Members of the communal forestland have their own cultural rules and regulation or customs for sustainable utilization. These customs of the local people permit inheritance of communal forest to their offspring. This is true even to the

<sup>3</sup> It is estimated that one hectare is equivalent to 6 *timads*.

<sup>4</sup> Private forestland plot refers to the *usufruct* right, the individual use right to farm household.

specific trees. The survey result showed that about 55 per cent of sampled households had inherited the forestland from their family while the other 36 per cent acquired it from *kebele* administrators. The remaining 9 per cent accessed forestland through informal land marketing like benefit sharing, renting and contracting.<sup>5</sup> If one looks at time of acquisition, most of the households (57 per cent) acquired the forestland during Imperial Regime, while about 32 per cent during the *Derg* Regime and the rest 11 per cent got right to use forest plot under the EPRDF Regime.

It was found that there was no clear understanding and significant differentiation in usage by local people with tenure system particularly between communal and *kebele* forest.<sup>6</sup> About 44 per cent of sampled households believed that *kebele* forest belongs to the state while almost equivalent size of sampled households consider it as the property of both the local community and the state. The other 9 per cent of the sampled households mentioned that the *kebele* forest belongs to the local community. The remaining 4 per cent stated that they did not know the owner. On the other hand, 81 per cent of the sampled households harvested forest products from delineated *kebele* and/or state forest out of which only 6 per cent were accused of the wrong-doing. This implies that enforcement of law in the area is weak. It is also important to note that most of the sampled households, about 62 per cent, believed that local culture and norms can help to conserve culturally valuable parts of the natural forest although not the whole forest.

### 6.5.2 Use value

In estimation of the economic value of Sheka Forest, some times called Salle-Anderacha National Priority Forest Area, the use value components were discussed as direct and indirect use value that were further classified based on framework presented in the methodological section. The direct use values of the natural forest can be either extractive (consumable in some environmental economics literatures) or non-extractive benefits of the natural forest (SCBD 2001; Spaninks and Beukering, 1997), while the environmental and ecological services of the natural forest is categorized and discussed as indirect use value.

---

<sup>5</sup> Contracting land in the area is usually an informal way of selling land as those contracted out never claim the forestland again. Most of the rural households who contract out forestland are aged and leave the area.

<sup>6</sup> State and *kebele* forest are used interchangeably to mean the delineated forest found in most *kebeles* for conservation. But, in some other areas there are also *kebele* forest, particularly with forest coffee and spices that belongs to the respective *kebele* offices to generate revenue out of it.

### 6.5.2.1 Direct use value

Direct use values of the natural forest include house construction material like poles, thatch-grass (Figure 6.1); house utensils, farm equipment and fuelwood, which can be either in the form of timber and non-timber forest products. Basically timber extraction for two purposes was identified in the study area. The first one is timber making for market, which is usually illegal while the second type of extraction is for own consumption under permission of local government body. For instance, timber extraction for funeral purpose, called ‘gonoo’, is one of the important timber demands of the local people. The key informants mentioned that illegal timber extraction expanded during the last five to seven years with increased access to infrastructure such as road development and coming of in-migrants.



Figure 6.1 Different timber and NTFPs for common house construction in Sheka

The survey result showed that timber extraction for house construction alone is estimated to be about 42 Birr per ha per annum. There is also household demand for forest products to make house furniture and utensils which is estimated to be about 10 Birr per ha per annum.

There are also quite significant benefits that the local people extract from the natural forest for farm implements and fencing. The common farm implements include beam, yoke, *Irf* and hoe/axe handles and *digrii*. Taking the stated farm implements only, although there are some others, the value of natural forest to the local people in the form of farm implements is estimated to be Birr 9 per ha per annum. As to fencing, households usually fence, on average, two farm plots and the homestead (Table 6.4). The average value of forest products extracted for fencing purposes is estimated to be about Birr 27 per ha per annum.

Table 6.4 Value of construction material, utensils and implements (in Birr)

Purpose	Value /household	ANV/ha*
House construction	137	42
Utensils	33	10



Farm implement	28	9
Fence	86	27
Other	3.51	1
Total	287.51	89

Source: own field survey, 2005; \* ANV = annual net value

#### *Non-timber forest products*

The common non-timber forest products identified were honey, forest coffee, spices, bamboo, fuelwood and charcoal, and others such as palm and wild fruits. Some of the non-timber forest products have market while the rest do not. The former were valued at market price whereas indirect valuation methods were employed for the later. Furthermore, to arrive at its economic value costs of production have to be deducted. Peter *et al.* (1998) suggested that costs of non-timber forest products production should be estimated at 40 per cent of the forest products value including labor, capital, processing, and transaction costs. In the study area, respondent sales timber and non-timber forest products at local market with no significant processing, capital and transaction cost involve in it. Thus, for this study, cost of production is estimated to be 10 per cent, mainly labor cost, of the output value.

Honey is the main NTFP in the study area and most important cash source for the local communities. In this line, inputs from flowers of a number of plant species in the natural forest are indispensable for bee-keeping activities. It is the most eco-friendly forest product. The annual net value of honey harvest in the area is estimated to be about Birr 487.00 per household per year. Nevertheless, participants of the focus group discussion in Keja-Chewaka *Kebele* mentioned that deforestation activities and chemical application undertaken in their area had serious adverse impact on their honey production. As a result, farmers in some *kebeles* of Masha *Woreda* such as Uwa, and Keja-chewaka, are forced to go for border natural forest in Oromia region to hang beehives, under contract arrangement (like benefit sharing) made between individuals.

Forest coffee is also another important non-timber forest product in the study area (Figure 6.2). The benefit of natural forest in terms of forest coffee harvested is estimated to be Birr 35 per sampled household per year. This does not show the real value of the natural forest in terms of forest coffee production since this figure is quite small as compared to the potential of the natural forest identified through group discussion. Perhaps one reason may be the fact that coffee production in the area is mainly in garden production system (Tadesse Weldemariam 2005). The key informant farmers and experts estimated a sustainable production of 300–600 kg of coffee per ha. Harvesting forest coffee for market purpose is a recent practice as it is mainly used for home consumption. Currently, there are forest coffee

cooperatives established in the area under Sheka Coffee Farmers Cooperative Union. The union is creating market access for coffee producers. The extractive use value of forest coffee is estimated to be about Birr 1,008.00 per hectare per annum, taking estimated sustainable production per ha and average price of the Zone at Birr 4.72 per coffee whole (CSA 2005).



**Figure 6.2 Typical forest coffee in Sheka natural forest**

Ethiopian korerima and long pepper constitute the two important spices in the area. Harvested value for other spices was null, while for korerima it was about Birr 11 per household per year in the 2004/05 production year. This is because most of the households do not harvest spices to valuable extent. But based on information from key informants, the average productivity may be estimated to be 100–300 kg of korerima per ha of forest under sustainable extraction (Figure 6.3). Taking average local market price of Birr 5 per kg with 10 per cent cost of production, the mean value is estimated to be Birr 675 per ha of forest per annum.



**Figure 6.3. Ethiopian Korerima in Sheka natural forest**

Long pepper is another spice of good economic importance potential to serve local people as source of income (Figure 6.4). However, harvesting long pepper for sale is less common in the area as compared to *korerima*. Based on key informants discussion it is estimated that about 200–300 kg of long pepper can be harvested per hectare of forest per annum under sustainable extraction. Accordingly, the value of natural forest based on mean long pepper production, at 10 per cent production cost and market price of Birr 3 per kg, is estimated to be Birr 675 per ha per annum.

Bamboo is one of the important forest products in the study area. The local people extract bamboo for fencing their homestead and farmlands, for house construction, for making beehives, and to make house utensils like shelf, baskets, cups and *ego*<sup>7</sup> (Figure 6.5). Sheka Forest is estimated to be endowed with about 13,552 ha of bamboo forest which makes about 13 per cent of the natural forest. It is estimated to have about 100,000 to 150,000 bamboo stands per hectare of bamboo forest. The average optimum harvesting age for bamboo to be used for house construction, fencing and to make beehives is about four years (Tadesse Weldemariam 2005). Taking the local market price of 2 Birr per matured bamboo plant at Masha, and 20% cost of harvesting and transporting, the net value is about Birr 40,000 to 60,000 per ha of bamboo forest per annum. This implies that, besides its huge ecological value, the total net direct use value of bamboo forest in Sheka Zone is estimated to be Birr 542 to 813 million per annum under sustainable extraction.



<sup>7</sup> Local name for ma

**Figure 6.4 Long pepper in Sheka natural forest**



**Figure 6.5. Bamboo extraction and its use**

Fuelwood is the sole source of energy to the local community for food preparation as well as to heat houses while charcoal is mainly used for commercial purpose. Charcoal is an important forest product which is a means of livelihood for low income people of the study area. Recently, fuelwood collection for commercial purpose has also been started. Key informants mentioned that unsustainable fuelwood collection and charcoal making is contributing to deforestation. The survey result revealed that almost all households harvest one head load fuelwood per day for either consumption or sale. The annual value of the natural forest to a household is estimated to be Birr 1178 for fuelwood and Birr 13 for charcoal per household per annum.

There are also traditional herbal and plant medicines that are used by the local people to treat human and animal ailments. There are a number of traditional medicine venders and also a large number of local people who go to the venders for both human and livestock sicknesses. Therefore, it is reasonable to include medicinal plants value as direct use value in NTFPs. Traditional venders in the study area usually collect medicinal plants in small amount to treat particular diseases. Moreover, these plants or plant derived parts are non-traded. If there is no market price for a given forest product, according to TEV, one has to go for substitute products. The closest substitutes for traditional medicine in the area are some manufactured medicines which are available at local health centers and rural drugs stores. But, venders were not very open to tell specific information on the medicinal plant and their income from these plants. This makes economic value

estimation of the medicinal plants under both market price and close substitute techniques hardly possible.

The other possible valuation technique is to find a commercially valuable substance from the medicinal plants from the area. This may be either at market value of traded plant material or drugs obtained from the plant, or WTP of the company for a given medicinal plant species. But in the study area these medicinal plants are used only by traditional healers so far. Thus, there is no commercial value attached to these medicinal plants. Therefore, for the purpose of this study, the value of medicinal plants in Sheka natural forest is taken into account in its economic valuation as an option value and estimated through willingness to pay by the local people.

There are a number of other direct use values of the natural forest like palm for making mats. Grazing is also an important value of the natural forest. All households graze their livestock in the forest. In most of the study areas, the local people let their livestock stay in the forest even the whole night. So the value of natural forest in terms of grazing can be perceived from livestock's being the main asset to the local people. Moreover, the natural forest buffers food insecurity during bad season being a source of wild fruits/food, particularly, for poor households. These are direct use values of the natural forest.

The direct use value of the natural forest is estimated to be Birr 1,794.00 per household per annum. It is estimated to be about Birr 1192 per hectare of natural forest based on current extraction level. It is also estimated that it is possible to increase the direct use value of natural forest to Birr 8,142.13 per hectare sustainable traditional production (Table 6.5). This value can be further increased by taking advantage of production of certified eco-friendly goods and services

**Table 6.5 Direct use value of non-timber forest products (in Birr)**

Purpose	Value /household	Potential value /ha	ANV/ha	PANV/ha*
Forest coffee	44.00	1260	12.67	1008
Honey	487.00	-	135.87	135.87
Spices				
- <i>Ethiopian Korera</i>	12.00	360	3.35	675
- Long pepper	-	750	-	675
Bamboo**	10	-	2.79	5302
Palm	10	-	2.79	2.79
Fuelwood & charcoal	1191.00		332.3	332.3
Beehive	25		6.98	6.98
Other NTFPs	15		4.19	4.19
<b>Total</b>	<b>1794.00</b>		<b>1191.96</b>	<b>8142.13</b>

Source: own field survey, 2005; \* PANV= potential annual value that can be extracted sustainably; \*\* specific only to bamboo forest

### 6.5.2.2 *Indirect use value*

#### **A. Eco-tourism**

Sheka Forest has scenic beautiful landscape suitable for camping and mountain trekking. It has waterfalls and caves with historical background like Birbirso, Beroda and Koda in Uwa *Kebele*, Gatira, Tufo and Ursitu in Kaja *Kebele*, and Abakaki in Modi *Kebele*. It is also a home of clans of different culture. These imply the economic values associated with the natural forest for eco-tourism. Eco-tourism is, usually, valued at the economic cost that visitors to a particular site incur or in the form of opportunity cost of time, and travel expenses to visit the area. No tourists visit the area. Therefore, it is hardly possible to say the local people have so far benefited from the eco-tourism potential. Thus, in the absence of tourism, its economic value would be measured by comparing its potential with other similar areas with tourism experience. For instance, according to the 2003/04 Sheka Zone Investments Desk final report, a forest area of about 4200 ha is delineated for eco-tourism. The area identified for eco-tourism was reported to include a lake, waterfall, wild animals, over 180 plant species and suitable area for lodge establishment. Comparing it with other established tourism areas, its potential economic value in the form of eco-tourism is estimated to be about 3.25 Birr per hectare per annum. Moreover, it is good opportunity for GOs and NGOs to use this potential as one of the benefit sharing tracks for the local people for sustainable conservation of natural forest.

#### **B. Ecological value**

Ecological value of Sheka Forest includes flood preservation, soil conservation, landslide prevention, regulation of stream flow and riverbank stabilization, protection of swamps, recharging of ground water and maintaining water quality. Complete removal or unsustainable forest product extraction may lead to dramatic loss of the ecological services of the natural forest. This will in turn result in tremendous adverse effect on all people down stream. With removal of the natural forest, siltation and flood, decrease and untimely drying up of rivers is expected to occur on-site and off-site. Sheka Forest is an important catchment of Baro, Gamadro, and many other tributary rivers of the Nile River that starts from intact patches like Shaxo-Uto forest and bamboo forest. The catchment includes several swampy areas such as *Weroboo*, and *Bilo Chefe* in the natural forest.

The other watershed protection value considers its benefit in preventing soil erosion and flood. Soil erosion is referred as the detachment and transportation of the soil material either by water or wind. At national level the soil loss that occurs in conversion of forestland to grazing/wood land is estimated to be 5 tons per ha per year while its conversion to perennial crop and annual crop land increases the erosion rate to 8 tons and 42 tons per ha per year, respectively (Hurni 1987). The experimental study by Mekuria Argaw and his colleagues in Kaffa area closer to and of similar agroecology to Sheka, indicated that annual mean erosion rate is about 12.3 tons per ha per year for cultivated fields. Moreover, his result showed that there is increase in erosion rate for a given landuse with increase in age of plot being allocated to that landuse system. Soil erosion in Kaffa is less than the national value perhaps because of the intact forest in the upper watershed of the plots. Thus, to estimate soil loss assuming complete removal of the natural forest it is reasonable to consider the national erosion rate for our valuation. Accordingly, the soil conservation value of Sheka Forest is estimated to be Birr 745 per ha per year based on current fertilizer price (Techane Adugna, personal comm.) and blanket recommendation.<sup>8</sup>

Regarding environmental services, carbon storage and sequestration function is the most important global benefit of the natural forest. Tropical forests, including Sheka Forest, have a role in regulating carbon dioxide in the global atmosphere through the processes of respiration and photosynthesis, whereby plants absorb carbon dioxide and store it in their biomass. The sequestration rate of forest depends on age and forest condition.

In closed primary forests it is estimated that about 280 tones of carbon per ha may be stored, while secondary and open forest store about 194 tones and 115 tones per ha, respectively. Loss of the natural forest results in net release of carbon to atmosphere from different landuse. This varies from about 36 to 220 tones based on the condition of natural forest and alternative landuse (Spaninks and Beukering 1997). Conversion of closed primary forest to shifting agriculture releases about 200 tones of carbon, and little more is converted to pasture or permanent agriculture. Open forests would begin with around 115 tons and loose between 29 tones to 38 tones of carbon in its conversion to shifting and pasture/permanent agriculture, respectively (SCDB 2001). Total value of the Sheka Forest as a carbon storage is estimated to be about Birr 2 billion (Table 6.6). This economic value of the natural forest as carbon storage will be lost with loss of the forest.

**Table 6.6 Carbon sequestration value of Salle-Anderacha natural forest area**

Forest type	Area	Amount of carbon	Value
-------------	------	------------------	-------

<sup>8</sup> Blanket recommendation rate is an application of 1 quintal DAP and one quintal urea per hectare of plot.

	(in ha)	sequestered (tons/ha)	(Birr/ha)*
Closed forest	67794	280	23800
Open forest	35077	115	9775
Bamboo forest	13552	115	9775
<b>Average value/ha</b>			<b>18,199</b>

Source: Bedru (Chapter 2 of this book) with own computation;

\*based on exchange rate of 1 USD = 8.50 Birr

In case of tea/coffee plantation there is continuous harvest and it is a kind of monoculture production with only limited number of tree plants. It is estimated that tea and coffee plantation have a carbon storage capacity of 75 tons per hectare, which is the equivalent of regrowing forest (Rosales *et al.* 2005). This implies that conversion of the natural forest to tea/coffee plantation releases, 40 to 205 tons of carbon per ha. Then based on Fankhauser's estimate of 20 USD/ton of carbon (Frankhause 1994 as cited in Rosales *et al.* 2005) and taking a conservative figure of 10 USD/ton, it is arrived at an average value of 18,199 Birr per ha. On the other hand, cost of conversion of Sheka natural forest to tea/coffee plantation in terms of carbon storage is estimated to be about 3,400 to 17,425 per ha based on type of natural forest.

Besides its carbon storage service the natural forest has carbon-sequestering value, which is estimated from the point of avoiding damage from global warming and desertification. To date, there is strong scientific consensus about growing global warming of about 1.4 to 5.8°C over the coming 100 years with serious implication for human beings. Forest degradation and deforestation is identified as one of the main contributors to global warming (IPPC 2001 as cited in Mills 2002). Estimation of the value of natural forest in terms of carbon sequestration was, obviously, not an easy and clear concept for the local people. Thus, following Orlando *et al.* (2002) taking the net annual carbon sequestration value of tropical forests, 8 tons per hectare, with carbon emission price of 20 USD per ton of carbon absorbed from atmosphere, the annual carbon sequestration value of Sheka natural forest was estimated to be Birr 1360 per hectare per annum.

### C. Biodiversity

Regardless of its environmental services, like many other tropical natural forests, Sheka natural forest, an afro-montane biodiversity 'hot spot', delivers several ecological services. This is a part of global life supporting function of the natural forest, which is often valued indirectly since the local society takes it as 'free'<sup>9</sup> good. There is consensus that diversity is the result of evolutionary process for billions of years. The valuation of diversity embodies the stock of information and insurance (SCDB 2001). It is

<sup>9</sup> Sometimes called public goods. These are goods with no exclusive property right by individuals.



contained information that can be used to develop goods and services for the benefit of humankind, which derives from the fact that all species are co-evolved through interaction with each other.

Biodiversity mostly has the indirect use and non-use value to human beings at local, national and global level. Valuation of the non-use refers to the optional value of biodiversity which is taken care in section 6.4.3.1. In this section only the indirect use value of biodiversity is emphasized. Indirect use benefits usually arise from information or research value of biodiversity. It can be valued at the net benefit from the scientific research or at loss that occur if that biological diversity is not used in scientific research. The area is endowed with genetic and species diversity of crop plants such as coffee, spices and medicinal plants. Unfortunately, we do not have adequate evidence about scientific research employed on these genetic resources and generated benefit from the particular natural forest. Thus, it was not possible to estimate the biodiversity value of the forest. But it is important to sight a study by Hein and Gatzweiler (2005) who estimated that the genetic value of *Coffea arabica* alone, at net present value, can be USD 420 million at 10 per cent interest rate over thirty years. In this study, the alternative was to consider which government offices, NGOs and private companies would be willing to pay for protection of the stock of biodiversity in its natural habitat for investment made in the area (Mills 2002). *In situ* preservation of biodiversity can be best ensured under protection of entire ecosystems. Therefore, likely expenditure of strict protection is considered based on coffee conservation project document Agrisystem (2001; Aseffa Seyoum 2005). Accordingly, the indirect use value of biodiversity in Sheka natural forest was roughly estimated to be about 215.44 Birr per hectare per annum.

#### **D. Cultural value**

The lives of local people in the area is generally tied up with the natural forest, not only as a means of livelihood but also in its socio-cultural value. Thus, this is also an important indirect use component of the total economic value of the natural forest to the local community. The local people celebrate festivals and perform different ritual ceremonies in the forest and under selected/ respected trees like Ororo and in caves surrounded by intact natural forest. The common cultural belief worshiped in the forest is known as *guudo* and *deedo* (see Chapter 4). The socio-cultural value of the natural forest is captured through willingness to pay of the sampled respondents. Accordingly, it is estimated to be Birr 1.55 per annum per hectare Table 6.7). The local people believe that this culture has contributed to the conservation of natural forest. There are cultures that restrict the kind of tree used as fuelwood. For instance, it is taboo to burn Sesino and Ororo (named in Shakicho). Moreover, the culture of the local people prohibits them from cutting trees near swampy areas and rivers.

**Table 6.7 Indirect use value of the natural forest (in Birr)**

Indirect use	ANV/ha
Eco-tourism	3.25
Ecological value:	745
Watershed protection	
Biodiversity	215.44
Cultural value	1.55

Source: Own field survey, 2005

### 6.5.3 Non-use value

A natural forest could have non-use values, which are values not yet utilized but to be utilized (option value) or to be maintained for future generation (bequest value) or just the value that an individual attaches for its existence. These values include wildlife, biodiversity, and the legacy of leaving an intact forest ecosystem. The valuation can be focused on conservation of the different biodiversity, medicinal plant, raw material available and unused landscape in the forest either for own use in the future, or for once child or permitting the natural forest to exist regardless of the mentioned interests. The existence value of the natural forest is a separate component of non-use value of natural forest in different literature. In the present case it was identified that during questionnaire testing respondent farmers attached value to the existence of the forest for its ecological benefits. In this case, taking existence value as separate component would result in double counting. Thus, for this particular case it is important to consider existence value of natural forest as part of ecological value.

#### 6.5.3.1 Option value

Option value is the value that the local people are willing to pay for risk aversion. Its value emanates from the level of uncertainty expected. Option value of a given ecosystems depends basically on source of uncertainty about future preference, about availability of the environmental and ecological services in the future (Spaninks and Beukering 1997). Stock of biodiversity, medicinal plant and raw material in the forest may also serve as option in the future. The local people are well aware of the existence of a lot of species in the natural forest that can serve to treat ailments and as food source in case of lack of modern health treatment and in food deficit years, respectively. They cite as example that members of their family used to eat different tree fruits while going away from their home for hunting. Based on willingness of the sampled respondents, the optional value of natural forest was estimated to be Birr 6.20 per ha per annum.

### 6.5.3.2 *Bequest and existence value*

Bequest value is the utility derived from keeping intact natural forest with its different value for once own child. Focus group discussion participants put their concern of the bequest value of natural forest with the local saying 'kawo gundaki kitiye' which means enset that has produced seeds has stopped its life for its seeds. But even though the existence value of forests were described to them as, permitting the natural to exist regardless of their bequest and other services of the natural forest, they couldn't manage to make distinction between the bequest and existence value of the natural forest. Therefore, to avoid double counting in contingent valuation process, the two values were measured as permitting the existence of intact natural forest for future generation. The bequest and existence is valued at Birr 9 per ha. The most important issue related to bequest value of the natural forest was the tenure insecurity problem particularly in case of natural forest.

**Table 6.8. Non-use value of the natural forest (in Birr)**

Non-use values	Value/ hh/year	ANV/ha
Option value	20.00	6.20
Bequest and existence value	29.00	8.99
Total	49	15.19

Source: Own field survey, 2005

Total non-use value of natural forest was about Birr 15.19 per hectare which implies Birr 1.5 million per annum. The non-use value is quite small as compared to use value of the natural forest mainly because of the capacity of local people to pay and lack of tenure security.

### 6.5.4 Local peoples' dependency on forest

The natural forest is being encroached both by the local people and large scale investment. There are several causes of deforestation with various level of devastation. This section discusses the major causes of deforestation in relation to the local people, while deforestation due to large scale agriculture is addressed in the coming section.

Among others, high dependency level of smallholders on the natural forest is a factor that contributes to the degradation of the natural forest. Total average income of sampled households is estimated to be about Birr 1512 per annum. Honey was the main source of cash for about 42 per cent of sampled household while the rest 38 per cent, 16 per cent and 4 per cent

mainly depended on crop, livestock and other non-timber forest product and off-farm activities, respectively, as sources of cash. In 2004/05, out of the total income of a household, about 44 per cent was generated from forest products while 43 per cent was from livestock. The remaining 8 and 5 per cents were from crop and off-farm activities, respectively (see Figure 6.6). Members of a household travel, on average, about one hour to a patch of forest on which they depend. Actually, they travel more distance to hang beehives than for other forest products.

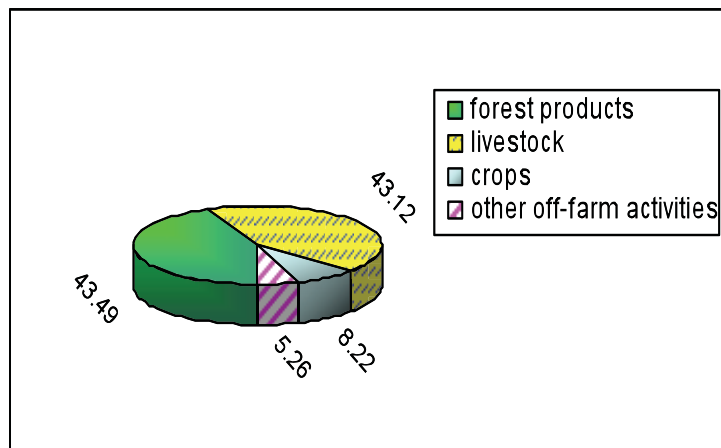


Figure 6.6 Household income sources (in per cent)

Most of the households depend on state and communal forest for their livelihoods. About 78 per cent of the sampled households meet their demand say climbers for hanging beehives in *kebele* forest while the rest 18 per cent depend on either communal or private forests. In the study area, out of the sampled households about 61 per cent had communal forest holdings. Communal forests can be most commonly used for hanging beehives and to harvest non-timber forest products under exclusive group property right.

The survey result revealed that smallholder farmers' in the study area encroach to the natural forest for two major reasons. The first and common one is for new agricultural land. This is mainly conversion of natural forest to agricultural land either by already established households or newly established ones. Secondly, there is extraction from the forest for construction, utensils and implements. The latter has less serious impact on forest degradation as compared to the former.

### 6.5.5 Investment in the area, benefits and farmers' perception

This is just to give insight to investment situation in Sheka natural forest area and its contribution to local development. In the area, large scale investment is becoming a threat to conservation of the natural forest. Investments being undertaken in the area deal with mostly production of perennial crops like coffee and tea. But there is observed trade-off between expansion of investment area and natural forest conservation. Tea plantations demand fertile land with acidic soil. Most investors request for lands with intact natural forest in order to minimize their cost of production which is the reason for the trade-off relationship between tea plantation and natural forest conservation. So far several investors have requested for land to establish tea and coffee plantation. This worries the local people that their forestlands owned under customary right known as "kobbo" will be taken by investors.

Currently, there is an increasing trend of investment in the area. According to the 2003/04 Sheka Investments Desk Annual Report, 6646 ha of rural land was delineated for investment out of which 2500 ha was for coffee and spices as well as for fish production. Guide map has been prepared for about 4270 ha of the area, out of which 1496 is already delivered for investors in the agricultural sector.

Some investments such as tea plantation require complete removal of the natural forest. In such cases, the net benefits of the natural forest conservation scenario become opportunity costs to investment scenario. To estimate benefits of alternative investment the study considered tea plantation which is being promoted in the area under both large scale investment and smallholder farmers. This was done based on data for Gumaro tea plantation due to lack of sufficient data from the recently established Chawaka-Uto tea plantation. Accordingly, the private value of tea plantation was estimated to be Birr 4,112.95 per ha per year taking domestic price as Birr 10.78 per kg and cost of production of about Birr 9 per kg with productivity of 2310 kg of made tea per ha (Ethio-Agri-CEFT 2004). But if we look at the impact of conversion of a hectare of natural forest to tea/coffee plantation just in terms of carbon sequestration alone, it costs from Birr 3,400 to 17,425 per ha.

Regarding community development contribution of investment activity in the area, participants of the group discussion mentioned that investors had failed to keep their promise. For instance, they mentioned that Chewaka-Uto tea plantation had promised to provide potable water, build school for their children, and other infrastructures like roads, which were not implemented. Gemadro Coffee plantation had actually made some contribution in construction of churches, schools, and gravel road.

The employment opportunities created were also not to the expected level as participants of the group discussion stated. Investment in their area could not generate youth employment opportunity or reduce unemployment in the rural community. For instance, Gemadro has employed a maximum of 1280 persons out of which only 9 per cent were permanent staff. Most of the employees were from other areas such as Bench-Maji and Dawaro (Desalegn Asnake, personal comm., 2005). Wages to the daily laborers vary based on their duties. For some activities like coffee cherry harvest payment was based on quantity of coffee that an employee harvested. Those daily laborers that harvest coffee cherry beans receive Birr 0.25–0.35 per kg while those assigned to other duties are paid Birr 6–7 per day (Desalegn Asnake, personal comm., 2005). On the other hand, surrounding of Chewaka-Uto tea plantation, about 15 per cent of households had been employed at least once in 2004/05 as daily laborer in peak seasons with average wage of about Birr 5 per day, which was considered too low by them.

Moreover, the local people mentioned that large-scale investment had some other adverse socio-economic effects like settlement of in-migrants who get employment in the plantation. They also mentioned that their children drop out of school to be employed as daily laborers for low wage. The key informant *kebele* officials also mentioned that deforestation of the natural forest for investment, without compensating the local people who had protected it for centuries, has serious consequences on the role of the community in conserving the natural forest. As a result, farmers develop negative perception about tea plantation in their area, which will eventually put sustainability of large scale investment in tea plantation in the area at risk.

The local people consider investment in their area hazardous to the natural forest. Most of the sampled households, about 73 per cent, mentioned that investment in their area is accompanied by deforestation that end up in environmental change. Some of them, about 7 per cent, cited that their land is taken for investment purpose without compensation while some others, about 3 per cent, mentioned that investment had an influence on the attitude of the local people towards conservation of the natural forest. The other 4 per cent of the sampled households believe that investment could not have any problems while about 13 per cent said that they do not know the ultimate impact of the investment undertaken in their area (Table 6.9).

**Table 6.9 The major problems of investment as perceived by the local people**

Problems	N	Per cent
Deforestation and environmental change	52	73.2
Taken smallholders plot	5	7.0
Change in behavior of local farmers	2	2.8
No problem	3	4.2

I do not know

9

12.8

Key informants stated that tea plantations take from three to four years to cover the land. This exposes the top soil to strong run off created by intensive rainfall which is common in the area. Most of the sampled households strongly oppose allocation of natural forest to investment, especially tea plantation. They strongly support the idea of conservation of the natural forest. However, some of them still agree, but not strongly, that part of the forest should be given to the landless local people for crop cultivation (Figure 6.7).

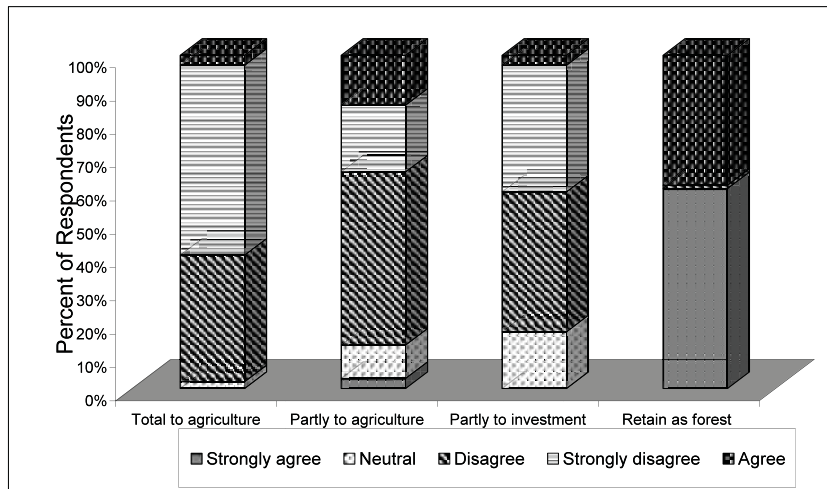


Figure 6.7 Attitude of respondents regarding natural forest conservation

### 6.5.6 Natural forest conservation verses investment

In this section we attempt to generalize the value of Sheka natural forest vis-à-vis investment in the area. In this comparison it is important to note that there are some economic, cultural, environmental and ecological services that can not be valued by this generation alone. Besides it is also a moral issue to keep the natural forest to the coming generation. Nevertheless, even if one looks at the net use value of extraction of non-timber forest products with zero management, which is about Birr 8142 per ha per annum. This value is almost two fold of the net benefits (about Birr 4,113 per ha) to be obtained if a given land is allocated to tea plantation.

In general, conservation with sustainable traditional use of Sheka natural forest can have a total averaged economic value of Birr 10,571.56 per hectare per annum (Table 6.10). There are also benefits like carbon storage value, which is about Birr 18,199.00 per ha. Moreover, it is important to bear in mind that there are still some implicit values of the natural forest that can not be captured separately in economic valuation process like use value of medicinal plants from its optional value.

**Table 6.10 Summary of economic value of Sheka Forest**

Use/Benefit type	Economic value (Birr/ ha/year)
Direct use	
Construction material and implements	89.00
Non-timber forest products	8142.13
Indirect use	
Eco-tourism	3.25
Watershed protection	745.00
Environmental- carbon sequestration	1360.00
Ecological - biodiversity	215.44
Socio-cultural value	1.55
Non-use value (Option, Bequest and Existence value)	15.19
<b>Total</b>	<b>10,571.56</b>

## 6.6 Conclusions and policy implications

### 6.6.1 Conclusions

Sheka natural forest is identified to have plenty of consumable and non-consumable benefits to local communities as well as stakeholders at different levels. The local people depend on the natural forest to fulfill many of their basic needs. The forest contributes a lot to the welfare of the local community. For instance non-timber products for Sheka Forests constitute 44 per cent of the household income. Particularly for households that fall in the lowest social strata like Menja, it is a very important source of livelihoods. It is also estimated that bamboo forest may generate benefits of Birr 542 to 813 million per annum. Besides, Sheka natural forest has a huge indirect use value to the local and national economy. For instance, the carbon sequestration value of the natural forest is estimated to be about Birr 2 billion.

The marginal value of the natural forest is expected to rise with increase in household income, decline in forest stock and increase in population due to



resource scarcity. The environmental and ecological value of the natural forest is also identified to be considerable. In a nutshell, the result of the study revealed that conservation of the natural forest under zero management has by far more economic value to the local communities, the nation and to the globe even by conservative estimation.

Nevertheless, there is a serious encroachment to the natural forest for agricultural land, which is being aggravated by private investment. Expansion of large scale private plantation is becoming the most important threat to the forest. It is also diluting the strong attitude that the local people had toward forest conservation. The underlying causes of deforestation in the area basically arise from weak policy enforcement and lack of strategy to balance conservation and development goals. There is also lack of benefit sharing mechanisms on conservation of genetic resource.

### 6.6.2 Policy implications

The main cause of deforestation of the natural forest is lack of management system that balances the development demand of the local community and conservationist goal to conserve the natural resource. Absence of mechanisms to realize the estimated use value of the natural forest for the benefit of the local community as well as to the national economy has been a serious problem. Therefore, participatory conservation approach that will enhance household income and community development should be a priority issue of any intervention option for the area.

There is a need to promote eco- friendly activities to increase benefit of the local community from existence of the natural forest. This may include activities like eco-tourism, game and production of eco-labelled forest products at better price premium.

The national as well as the regional governments should take into consideration the economic value of this natural resource and cost of its conservation to the local people in benefit sharing, for instance, in budget allocation.

There are cultures and values that prohibit mis-utilization of natural forest and tree harvesting from this mountainous area. Currently, most of these cultures are diluted due to socio-economic dynamism. There is a possibility to rehabilitate these cultures, as it may serve as a point of entry for sustainable conservation with transferable economic benefits from natural forest.

Fuelwood harvesting is also identified as the underlining cause of deforestation. Thus, there is a need to introduce technologies like biogas and

fuelwood saving stoves either with subsidy or through credit services to reduce pressure on natural forest for fuelwood.

Recognition of customary property right and households' spatial socio-economic difference in relation to the natural forest has to be taken into consideration in policy formulation. Although there were usufruct property right of an individual household to forestland plots like that of farmland elsewhere, the current land certification program fail to encompass certification of forestland plot in Sheka area. Its implication on forest conservation has to get sufficient attention to revisit the rules and regulations of land certification.

Lastly, the present work being of a general nature attempted only some aspects of Sheka Forest benefits but not in detail in some areas. Therefore, in-depth researches, which will pick and assess particular benefits of the natural forest like direct and indirect value of medicinal plants in the natural forest, and spatial dimension, are required.

## 6.7 Reference

- Agrawal, A. and Östrom, E. (2001). Collective Action, Property Right, and Decentralization in Resource Use in India and Nepal. *Politics and Society*, p. 29.
- Anonymous (2004). *Sheka Its Endowments*. Sheka Zonal Administration. Masha, Ethiopia (Amharic Version).
- Anonymous (2005). *Maritu*. Sheka Zonal Advertising and Cultural Office. Annual Bulletin 1(1). (Amharic Version).
- Aseffa Seyoum (2005). Conservation Costs of Wild Population of *Coffea arabica* in the Montane Rainforest of Ethiopia. MSc. Thesis Submitted to Alemaya University.
- Bielli, C., Gezu Berhanu, Amare Isaias and Orasi, A. (2001). Population Growth and Environment in Ethiopia: In-Depth Analysis from the 1994 Population and Housing Census of Ethiopia. Italian Multi-Bi Research project ETH/99/P01, Central Statistical Authority (CSA), Addis Ababa, Ethiopia and Institute of Population Research, Italian National Council for Research (IRP-CNR), Rome, Italy
- Cernea, M., Schmidt-Soltau, M.K. (1998). National Parks and Poverty Risks: Is Population Resettlement the Solution? FAO document. Italy, Rome.
- Merlo, M and Croitoru, L. (2005). *Valuing Mediterranean Forest: Towards Total Economic Value*. CABI Publishing.
- CSA (2003). Statistical Report on Socio-economic Characteristics of the population in Agricultural Household and Landuse. Central Statistical Authority (CSA), Addis Ababa, Ethiopia.

- CSA (2005). Producer Price of Agricultural Products at Zonal level. Monthly Statistical Report. Statistical Bulletin number 334. Central Statistical Authority (CSA), Addis Ababa, Ethiopia.
- Demel Teketay, Taye Bekele and Gunther, H. (2000). Forest and Forest Genetic Resource of Ethiopia. pp. 29-30. **In:** BSE (ed.). Programme and abstracts of an international Conference on "Ethiopia: A Biodiversity Challenge". Biological Society of Ethiopia (BSE) and the Linnean Society of London, Addis Ababa, Ethiopia.
- Ethio-agri-CEFT (2004). Annual Activity Report of 2004/05 Budget year. Addis Ababa.
- Ferraro, P.J. (2001). The Local Costs of Establishing Protected Areas in Low-Income Nations: Ranomafana Parks, Madagascar. Working Policy Working Paper Series. 35 pp.
- Frank, E. (2000). *Rural Livelihoods and Diversity in Developing Countries*. Oxford University Press. UK.
- Gittinger, J. (1982). *Economic Analysis of Agricultural Projects*. Second Edition. The Johns Hopkins University Press. 505 pp.
- Goodwin, B.K., Offenbach, L.A. Cable, T.T. and Cook, P.S. (1993). Discrete/Continuous contingent Valuation of Private Hunting Access in Kansas. *Journal of Environmental Management* **39**:1–12.
- Hein, L. and Gatzweiler, F. (2005). The Economic Value of Coffee (*Coffea arabica*) genetic resource. *Ecological Economics* (in Press)
- Hurni, H. (1987). Applied Soil Conservation in Ethiopia. Department of Agricultural Engineering, Nairobi University, Kenya. 15 pp.
- Kewak, S.J, Yoo, S.H. and Han, S.Y. (2003). Estimating the Public Value of Urban Forest in the Seoul Metropolitan Area of Korea: A Contingent Valuation Study. *Urban studies*, **40**(11):2207–2221.
- Kramer, R.A., Sharma, N. and Munasinghe, M. (1995). Valuing Tropical Forest: Methodology and Case Study of Madagascar. World Bank Environmental Paper, No. 13, Washington, D.C., U.S.A. 67 pp.
- Mekuria Argaw, Poul, L.G. Vlek, S., Park, M., Denich and Demel Teketay. (n.d). Assessment of Soil Erosion Using 137 Cs on Cultivated field Following Natural Forest Conservation in *Kefa* Zone of Southwest Ethiopia.
- Mills, N.L. (2002). Marketing Forest Environmental Services–Who Benefits? International Institute for Environment and Development. Gatekeeper Series No. 104.
- Mohammed Adilo, Feyera Senbeta, Abebe Yadessa and Tadesse Woldemariam (2004). The potential uses of *Trilepisium madagascariense* DC for Non-timber Benefits and the Need for Its Genetic conservation in southwest Ethiopia: **In:** conservation of Genetic Resources of Non Timber Forest Products (NTFPs) in Ethiopia. Proceedings of the workshop organized by International plant genetic resource conservation (IPGRI) and EARO from 5-6 April 2004. Addis Ababa. Ethiopia.

- Mohammed Adilo, Tadesse Woldemariam and Abebe Yadessa. (2006). Counting on forests: the role of non-timber forest products in rural household and national economy of Ethiopia. In: Commercialization of Ethiopian Agriculture. Proceedings of the 8th Annual Conference of Agricultural Economics Society of Ethiopia, February 24-26, 2005, Addis Ababa, pp 179-196.
- Peter, C.M., Gentry, A.H. and Menderlsohn R.O. (1998). Valuation of Amazonian Rainforest. *Nature*, 339.
- Richards, M., Davies, J. and Yaron, G. (2003). Stakeholders Incentives in Participatory Forest Management: A Manual for Economic Analysis. Oversea Development Institute, UK.
- Rosales, R.M., Kallesoe, M.F., Gerrard, P., Muangchanh, P., Phomatavong, S. and Khasomphou, S. (2005). Balancing the Returns to Catchments Management: the Economic Value of Conserving Natural forest in Sekong, Lao PDR. IUCN Water, Nature and Economics Technical Paper No. 5.
- SCBD (2001). The Value of Forest Ecosystems. CBD Technical Series 4. Secretariat of the Conservation on Biological Diversity (SCBD), Montreal, 67pp.
- Sekar, C. and Chandrasekaram, M. (2001). Environmental Impact Assessment Techniques. **In:** *Evaluation Framework for Agricultural Development Programmes and Projects*. (Ranasany, C., Sandaresan, R., Sharmugam, T.R., Sivalkumar, S.D. and Selvarai, K.N., eds). Training manual. Tamil Nadu Agricultural University, Coimbatore.
- Sheil, D. and Wunder, S. (2002). The Value of Tropical Forest to local Communities: Complications, Caveats and Cautions. *Conservation Ecology*. Accessed: <http://www.conecol.org.vol16/iss2/art9>.
- Shibru Tedla and Kifle Lamma (1999). National Environmental Management in Ethiopia: in Search of People's Space. pp. 18-40. *In: Environmental Planning, Policies and Politics in Eastern and Southern Africa* (Mohamed, S., and Shibru T., eds). Organization for Social Science Research in Eastern and Southern Africa (OSSREA).
- Spaninks, F. and Beukering, P.V. (1997). Economic Valuation of Mangrove Ecosystems: Potential and Limitations. EREED Working Paper No. 14.
- Tadesse Weldemariam (2005). Forest covers change and its impact of biodiversity in Masha and Aderacha *Woredas* of Sheka Zone, SNNP.
- Tamene Tiruneh and Legesse Tafa (2004). Livelihood and non-timber forest products in South-west Ethiopia. Non-timber Forest Products Research and Development Project Southwest Ethiopia. (Unpublished)
- Taye Bekele (2003). The Potential of Banga Forest for Certification. Paper prepared for national stockholders workshop on forest certification. Addis Ababa, Ethiopia.
- Terefe Degefa (2004). Indigenouse knowledge systems and practices: a theoretical reflection. **In:** Proceedings of Public Meetings on Integrated Forest Policy Development in Ethiopia, pp. 21-28. (Seyoum Mengistu and Negussu Akililu, eds). Forum for Environment (FFE), Ethiopia.

- Tsegaye Bekele, Feyera Senbata and Aklilu Ameha (2004). Impact of Participatory Forest Management Practices in Adaba-Dodola Forest Priority Area of Oromia, Ethiopia. *Ethiopian Journal of Natural Resource*. **6**(1):89-109.
- Wubalem Tadesse and Getachew Dessalegn (2004). Non-timber forest products of Ethiopia: their socio-economic importance and Resource potential. **In: Proceedings of Public Meetings on Integrated Forest Policy Development in Ethiopi**, pp. 49–53 (Seyoum Mengistu and Negussu Akililu, eds). Forum for Environment (FfE), Ethiopia.
- Zilberman, D. (2000). Valuation of Environmental Benefits. Training manual. Department of Agriculture and Resource Economics, University of California at Berkeley.

Table 2.4 Land cover change matrix from year 1987 to 2001

		2001								
		a	b	c	d	e	f	g	h	i
1987	→	Dense forest	Closed forest	Open forest	Agric & tree patch	Agri.	Exposed	Bamboo	Wetland	Tea plantation
1	→	36945.2	11505.8	5247.8	277.6	921.7	96.4			303.7
2	→	2364.7	3105.9	1797.8	75.5	568.5	35.9			58.3
3	→	3971.1	9531.7	24387.5	3281.8	4811.3	378.1			187.6
4	→	54.6	120.6	2382.0	1697.8	2425.9	146.0			29.7
5	→	22.1	45.6	1131.7	1296.6	5285.5	729.0			96.4
6	→			55.3	33.6	650.4	406.9			79.9
7	→							13330.2		
8	→								1621.6	
9	→	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Instruction of reading the table**

Across the rows the figures show the old (1987) extent of the land cover class in the row and the recent (2001) land cover class of the column. For example **4e** (4811.3 hectares) was open forest in 1987 before converting to agriculture in the 14 years period upto 2001. Classes that showed neither decrease nor increase are shown diagonally. Values in 1a, 2b, 3c, 4d, 5e, 6f, 7g and 8h, therefore, represent the sub-total sums of unaffected areas in each classes.

Deforestation for tea Total	549.6
Deforestation Total	10446.8
Forest Degradation Total	5247.8
Forest Disturbance Total	13303.5
Modification Total	3951.3
No change Total	86780.5
Restoration Total	15867.4
succession/regeneration Total	5144.4
Tea plantation converted from agric Total	206
Unknown total	537

**Table 4.4 Summary of major changes influencing resource conservation and use**

s/N	Time Span	Major events	Immediate consequence	Impact on Natural Resource Conservation
1	Pre 1974	-Clan leaders play an active role in NRM -Strong traditional belief -The introduction of new religion in 1970s	-Relatively good traditional resource conservation	-Strong TEK that contributed to good resource conservation
2	Post 1974 1974–1986	-Schools constructed -Villegization program -Construction of main road, 1986 (Masha-Gore road) -Establishment of Peasant Associations	-Better access to education among the marginalized minorities -Inability of minority group to adapt the new life style that contrasted with their earlier hunting life -Increased urbanization -Development of market economy -The role of clan leaders in NRM diminished	-Erosion of cultural values that promote TEK -Selling fuelwood started in 1991 by Manjós -Equating natural resource in terms of monetary value; attitudinal change in resource use and conservation -Increased deforestation
3	Post 1991 1991–1995 1995 1996–1999	-Expansion of new religion -Expansion of investment projects -Dramatic population increase due to investment	-Weakening of traditional belief system and resource management -Increased violation of customary resource management rights and practices -Development of market economy	-Increased deforestation of cultural forests -Expansion of farm lands by clearing forests -Some tree species endangered, <i>ororo</i> -Large-scale deforestation due to EACUTP -Uncontrolled use of forest and some forest product -Migration of wild animals from the area -Erosion of TEK and diffusion of environmentally unfriendly cultures -Increased consumption of forest products (both legal and illegal) in the form of fuelwood and charcoal

**Appendix 1 Landcover classes (ha) of each kebele in Masha and Anderacha Woredas in 1987**

Woreda	Dense closed forest												Open forest												Agric./tree mosaic												Agric/ shrub												Exposed/ cultivated Bamboo forest												Wetland												Kebele size (±4.5 ha)
	Dense closed forest				Closed forest				Open forest				Agric./tree mosaic				Agric/ shrub				Exposed/ cultivated Bamboo forest				Wetland				Kebele size																																												
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%																																					
1 Welo	3158.2	47.5	643.4	9.7	1782.0	26.8	209.5	3.1	587.8	8.8	210.8	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6652.9																																							
2 Uva	1294.4	47.4	245.0	9.0	938.4	34.4	31.6	1.2	135.9	5.0	82.9	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2730.7																																								
3 Keja-Chewaqa	2587.6	54.1	487.9	10.2	1015.0	21.2	116.4	2.4	274.9	5.7	208.6	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4780.9																																								
6 Beto	1215.2	51.5	131.5	5.6	402.1	17.1	66.3	2.8	180.5	7.7	38.9	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2357.7																																								
4 Qarina	1624.9	50.8	306.3	9.6	1048.2	32.8	67.0	2.1	126.8	4.0	25.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3199.1																																								
5 Degelle	1238.9	34.4	118.5	3.3	1418.8	39.4	173.7	4.8	503.0	14.0	151.4	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3604.2																																								
7 Yepo	2366.9	60.8	294.2	7.6	938.9	24.1	60.6	1.6	134.9	3.5	19.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3894.1																																								
8 Gamboka	968.1	32.3	226.0	7.5	1012.0	33.7	165.3	5.5	311.4	10.4	60.4	2.0	200.9	6.7	55.7	1.9	2099.8																																																								
9 Atille	2173.4	36.6	631.0	10.6	2046.6	34.4	150.6	2.5	185.1	3.1	9.2	0.2	582.4	9.8	165.2	2.8	5943.5																																																								
10 Chago	1155.9	34.5	268.0	8.0	1282.7	38.3	309.5	9.2	314.0	9.4	21.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3352.1																																									
11 Abbelo	99.6	9.2	35.6	3.3	391.9	36.2	130.8	12.1	320.6	29.6	98.5	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1082.2																																								
12 Masha	154.9	20.1	37.8	4.9	173.3	22.4	30.9	4.0	203.4	26.3	128.6	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	772.3																																								
13 Akako (Yesha)	5353.5	56.9	522.0	5.5	2849.5	30.3	228.4	2.4	148.4	1.6	4.7	0.0	120.3	1.3	190.2	2.0	9416.8																																																								
14 Attesso	864.2	19.9	190.8	4.4	1199.8	27.6	227.9	5.3	465.2	10.7	56.3	1.3	1231.1	28.4	105.0	2.4	4340.2																																																								
15 Kewo	1354.8	49.8	92.1	3.4	984.3	36.2	131.9	4.9	154.3	5.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2718.6																																								
16 Shebo	119.8	11.2	36.2	3.4	416.0	38.7	129.9	12.1	345.4	32.2	26.7	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1073.9																																								
17 Shekbedo	1491.2	42.3	199.0	5.7	1497.0	42.5	197.0	5.6	125.2	3.6	12.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3521.6																																								
18 Gattimo	590.5	13.6	125.4	2.9	1264.8	29.1	160.2	3.7	290.0	6.7	14.2	0.3	1775.7	40.9	119.5	2.8	4340.4																																																								
19 Yina	3223.1	37.1	351.1	4.0	2957.5	34.1	413.3	4.8	481.8	5.6	13.6	0.2	1112.0	12.8	125.4	1.4	8677.9																																																								
20 Gojja	4555.9	43.5	410.6	3.9	4006.9	38.2	392.2	3.7	458.4	4.4	8.7	0.1	622.4	5.9	25.9	0.2	10481.1																																																								
21 Gada	1775.3	60.0	167.0	5.6	705.3	23.8	117.8	4.0	167.3	5.7	0.1	0.0	27.2	0.9	0.0	0.0	2959.8																																																								
22 Kangga	1237.4	26.1	214.9	4.5	967.7	20.4	102.1	2.2	102.9	2.2	0.0	0.0	2032.7	42.8	88.0	1.9	4745.7																																																								
23 Gabenna	1203.1	34.1	312.8	8.9	1600.2	45.3	162.6	4.6	207.6	5.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3528.5																																								
24 Gecha	816.2	45.1	39.1	2.2	664.7	36.8	124.0	6.9	158.7	8.8	6.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1808.6																																								
25 Abbena	181.5	20.5	57.1	6.4	436.1	49.2	134.9	15.2	76.0	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	885.7																																								
26 Shera	4907.1	39.1	386.5	3.1	5275.8	42.0	1238.1	9.9	736.1	5.9	12.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12555.5																																							
27 Getitba	233.4	21.8	60.7	5.7	423.9	39.6	56.5	5.3	26.9	2.5	0.0	0.0	262.3	24.5	5.9	0.5	1069.6																																																								
28 Tugri	1926.4	26.6	281.5	3.9	1710.8	23.6	255.7	3.5	349.0	4.8	5.0	0.1	2496.9	34.4	222.8	3.1	7248.2																																																								
29 Chicha	848.3	22.0	200.1	5.2	1401.4	36.4	259.8	6.7	227.2	5.9	3.5	0.1	888.0	23.0	26.2	0.7	3854.6																																																								
30 Gayi	1396.7	44.8	130.6	4.2	1114.1	35.8	257.6	8.3	213.6	6.9	2.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3114.7																																								
31 Modi	206.6	20.4	18.9	1.9	397.2	39.2	161.3	15.9	223.7	22.1	4.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1012.2																																								
32 Beshafa	1184.2	34.5	191.5	5.6	1414.7	41.2	296.9	8.6	348.2	10.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3436.2																																							
33 Gamadiro	2518.1	40.2	481.6	7.7	2426.8	38.7	266.1	4.2	22.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6268.7																																							
34 Yukchichi	1279.3	36.0	120.6	3.4	429.2	12.1	32.4	0.9	12.9	0.4	0.0	0.0	1604.8	45.2	69.7	2.0	3549.0																																																								
<b>Total</b>	<b>55304.5</b>		<b>8015.0</b>		<b>46593.6</b>		<b>6858.6</b>		<b>8619.7</b>		<b>1228.3</b>		<b>13466.5</b>		<b>1890.6</b>		<b>141976.9</b>																																																								



**Appendix 2 Landcover classes (ha) of each kebele in Masha and Anderacha Woredas in 2001**

Woreda	Dense closed forest		Closed forest		Open forest		Agric/ tree mosaic		Agric		Exposed/ cultivated		Bamboo forest		Wetland		Tea impacted		Kebele size (±4.5 ha)
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	
1 Welo	2212	33.3	1895	28.5	1212	18.2	213	18.2	12.3	3.2	816	12.3	251	3.8	0	0.0	53	0.8	6653
2 Uwa	975	35.7	732	26.8	577	21.1	67	2.5	193	7.1	184	6.7	184	6.7	0	0.0	2	0.1	2729
3 Keja-Chewaqa	1351	28.3	1394	29.2	780	16.3	98	2.0	236	4.9	86	1.8	0	0.0	78	1.6	758	16	4782
4 Beto	780	33.1	600	25.4	410	17.4	32	1.4	213	9.1	14	0.6	0	0.0	308	13.1	0	0	2358
5 Qarina	2226	69.6	339	10.6	308	9.6	27	0.8	228	7.1	71	2.2	0	0.0	0	0.0	0	0	3199
6 Degelle	1251	34.7	569	15.8	574	15.9	16	0.4	897	24.9	295	8.2	0	0.0	0	0.0	0	0	3603
7 Yepo	1655	42.5	1131	29.0	803	20.6	40	1.0	182	4.7	12	0.3	0	0.0	72	1.9	0	0	3895
8 Gamboka	1271	42.4	368	12.3	358	11.9	4	0.1	648	21.6	98	3.3	204	6.8	50	1.7	0	0	3000
9 Atille	2738	46.1	737	12.4	1131	19.0	201	3.4	400	6.7	16	0.3	583	9.8	136	2.3	0	0	5942
10 Chago	741	22.1	742	22.1	1221	36.4	134	4.0	471	14.0	44	1.3	0	0.0	0	0.0	0	0	3353
11 Abbello	40	3.7	133	12.3	356	32.9	67	6.2	424	39.2	57	5.2	0	0.0	5	0.4	0	0	1082
12 Masha	43	5.6	53	6.8	116	15.0	2	0.2	374	48.3	146	18.9	0	0.0	39	5.1	0	0	773
13 Akako (yehsa)	4182	44.4	1964	20.9	2176	23.1	432	4.6	366	3.9	12	0.1	123	1.3	161	1.7	0	0	9416
14 Attesso	860	19.8	367	8.5	796	18.3	117	2.7	801	18.5	74	1.7	1231	28.4	94	2.2	0	0	4340
15 Kewo	782	28.8	786	28.9	759	27.9	41	1.5	342	12.6	8	0.3	0	0.0	0	0.0	0	0	2719
16 Shebo	73	6.8	101	9.4	351	32.7	35	3.2	487	45.3	28	2.6	0	0.0	0	0.0	0	0	1074
17 Shekbedo	853	24.2	790	22.4	1191	33.8	355	10.1	240	6.8	92	2.6	0	0.0	0	0.0	0	0	3521
18 Gattimo	453	10.4	447	10.3	836	19.3	115	2.6	574	13.2	31	0.7	1786	41.1	100	2.3	0	0	4343
19 Yina	2564	29.5	1532	17.7	2009	23.2	149	1.7	1160	13.4	32	0.4	1127	13.0	105	1.2	0	0	8678
20 Gojja	3272	31.2	1779	17.0	3498	33.4	781	7.5	494	4.7	12	0.1	620	5.9	22	0.2	0	0	10476
21 Gada	1683	56.9	521	17.6	312	10.6	22	0.7	380	12.8	15	0.5	27	0.9	0	0.0	0	0	2961
22 Kangga	1337	28.2	475	10.0	549	11.6	47	1.0	221	4.6	5	0.1	2045	43.1	68	1.4	0	0	4745
23 Gabenna	1414	40.1	594	16.8	1024	29.0	143	4.1	321	9.1	3	0.1	0	0.0	33	0.9	0	0	3531
24 Gecha	547	30.3	428	23.7	485	26.8	10	0.6	314	17.4	23	1.3	0	0.0	0	0.0	0	0	1807
25 Abbena	177	20.0	141	15.9	389	43.9	32	3.6	148	16.6	0	0.0	0	0.0	0	0.0	0	0	887
26 Shera	3292	26.2	1616	12.9	4870	38.8	2225	17.7	515	4.1	33	0.3	0	0.0	0	0.0	0	0	12551
27 Gettita	193	18.0	155	14.5	292	27.2	15	1.4	149	13.9	1	0.1	261	24.4	4	0.4	0	0	1070
28 Tugri	1582	21.8	959	13.2	1296	17.9	135	1.9	536	7.4	22	0.3	2521	34.8	196	2.7	0	0	7247
29 Chicha	795	20.6	424	11.0	1162	30.2	99	2.6	456	11.8	8	0.2	890	23.1	21	0.5	0	0	3854
30 Gayi	1148	36.9	481	15.4	903	29.0	347	11.2	226	7.3	9	0.3	0	0.0	0	0.0	0	0	3115
31 Modi	152	15.1	123	12.1	351	28.3	94	9.3	283	27.9	8	0.8	0	0.0	0	0.0	0	0	1011
32 Beshafa	1018	29.6	600	17.5	1170	34.1	196	5.7	444	12.9	8	0.2	0	0.0	0	0.0	0	0	3436
33 Gamadiro	905	14.5	950	15.2	2364	37.8	368	5.9	1033	16.5	88	1.4	517	8.3	35	0.6	0	0	6260
34 Yukichichi	858	24.2	443	12.5	446	12.6	18	0.5	102	2.9	8	0.2	1616	45.1	59	1.7	0	0	3551

Woreda	Dense closed forest	Closed forest	Open forest	Agric/ tree mosaic	Agric	Exposed/ cultivated	Bamboo forest	Wetland	Tea impacted
	Area %	Area %	Area %	Area %	Area %	Area %	Area %	Area %	Area %
<b>Total</b>	<b>43424</b>	<b>24370</b>	<b>35077</b>	<b>6675</b>	<b>14672</b>	<b>1793</b>	<b>1355</b>	<b>1641</b>	<b>758</b>

### Appendix 3 List of plant species recorded in Masha and Aderacha Woredas of Sheka Zone

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
1	<i>Abutilon longicuspe</i>	Malvaceae	shrub	Medicine for intestinal worms, tool handle	x	
2	<i>Acacia brevispica</i>	Fabaceae	climber		x	x
3	<i>Acalypha sp.</i>	Euphorbiaceae	shrub		x	
4	<i>Acanthopate pubescens</i>	Acanthaceae	shrub		x	x
5	<i>Acanthus eminens</i>	Acanthaceae	shrub	fodder for goats	x	x
6	<i>Acmella caulihiza</i>	Asteraceae	Herb		x	x
7	<i>Aframomum corrorima</i>	Zingiberaceae	shrub	Spice	x	x
8	<i>Ageranthum conyzoides</i>	Asteraceae	Herb		x	
9	<i>Alangium chinense</i>	Alangiaceae	Tree	Beehive, beehive hanging	x	x
10	<i>Albizia grandibracteata</i>	Fabaceae	Tree	Beehive hanging, beehive, fence, house construction	x	x
11	<i>Albizia gummifera</i>	Fabaceae	Tree	Beehive hanging, beehive, fence, house construction	x	x
12	<i>Allium cepa</i>	Alliaceae	Herb	food crop	x	x
13	<i>Allium sativum</i>	Alliaceae	Herb	food crop	x	x
14	<i>Allophylus abyssinicus</i>	Sapindaceae	Tree	Fuelwood, charcoal	x	x
15	<i>Allophylus africanus</i>	Sapindaceae	Tree		x	
16	<i>Allophylus macrobotrys</i>	Sapindaceae	Tree		x	x
17	<i>Amaranthus hybridus</i>	Amaranthaceae	Herb		x	x
18	<i>Amaranthus sp.</i>	Amaranthaceae	Herb		x	x
19	<i>Amorphophallus gallaensis</i>	Araceae	Herb	vet medicine	x	x
20	<i>Anemone thompsonii</i>	Ranunculaceae	Herb		x	
21	<i>Antiaris toxicaria</i>	Moraceae	Tree			x

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
22	<i>Apodytes dimidiata</i>	Icacinaceae	Tree	Bee forage, beehive hanging, fuelwood	x	x
23	<i>Arangis luteocalba</i>	Orchidaceae	Herb		x	
24	<i>Argemone macrophylla</i>	Euphorbiaceae	Small tree		x	x
25	<i>Arisaema flavum</i>	Araceae	Herb	vet medicine	x	x
26	<i>Arisaema schimperianum</i>	Araceae	Herb	vet medicine	x	
27	<i>Arundinaria alpina</i>	Poaceae	Small tree	Construction, processing	x	x
28	<i>Asparagus officinalis</i>	Asparagaceae	Herb	vet medicine	x	
29	<i>Bersama abyssinica</i>	Melastomaceae	Tree	Beehive hanging, mortar, fence, fuelwood	x	x
30	<i>Bidens pachtoloma</i>	Asteraceae	Herb	fodder, bee forage	x	x
31	<i>Bothriocline schimperii</i>	Asteraceae	shrub	Fodder, enhance milk production (cattle+human)	x	
32	<i>Brassica nigra</i>	Brassicaceae	Herb	spice	x	
33	<i>Brassica oleracea</i>	Brassicaceae	Herb	food crop	x	
34	<i>Brueea antidyenterica</i>	Simaroubaceae	Small tree	Vet medicine	x	
35	<i>Brueea antidyenterica</i>	Simaroubaceae	Tree		x	x
36	<i>Buddleja polystachya</i>	Loganiaceae	Tree		x	x
37	<i>Calpurnia aurea</i>	Fabaceae	Small tree		x	x
38	<i>Canarina abyssinica</i>	Campanulaceae	Herb		x	x
39	<i>Canthium oligocarpum</i>	Rubiaceae	Small tree		x	x
40	<i>Capsicum annum</i>	Solanaceae	Herb	spice	x	x
41	<i>Cardamine africana</i>	Brassicaceae	Herb			x
42	<i>Carduus nyassanus</i>	Asteraceae	Herb			x
43	<i>Cassipourea malosana</i>	Rhizophoraceae	Tree	Beehive hanging, fuelwood	x	x
44	<i>Catha edulis</i>	Celastraceae	Small tree	Stimulant, sales for cash	x	x
45	<i>Cayusea abyssinica</i>	Resedaceae	Herb			x
46	<i>Celtis africana</i>	Ulmaceae	Tree	bee forage, fence, fuelwood	x	x

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
47	<i>Celtis gompophylla</i>	Ulmaceae	Tree			x
48	<i>Celtis zenkeri</i>	Ulmaceae	Tree			x
49	<i>Chionanthus mildbraedii</i>	Oleaceae	Tree	Farm implement, tool handle	x	x
50	<i>Chloris sp.</i>	Poaceae	Herb			x
51	<i>Clausena anisata</i>	Rutaceae	Small tree	Tooth brush, fuelwood	x	x
52	<i>Clematis simensis</i>	Ranunculaceae	climber	fence	x	
53	<i>Clerodendron myricoides</i>	Verbenaceae	climber	bee forage	x	x
54	<i>Coccoloba abyssinica</i>	Cucurbitaceae	Herb	food crop	x	
55	<i>Coffea Arabica</i>	Rubiaceae	small tree	stimulant beverage	x	x
56	<i>Coleus edulis</i>	Lamiaceae	shrub	edible tuber	x	
57	<i>Colocasia antiquorum</i>	Araceae	shrub	food crop	x	
58	<i>Combretum paniculatum</i>	Combretaceae	climber		x	x
59	<i>Commelina sp.</i>	Commelinaceae	Herb	fodder, medicine for heart disease	x	x
60	<i>Cordia africana</i>	Boraginaceae	Tree			x
61	<i>Coriandrum sativum</i>	Apiaceae	Herb	spice	x	x
62	<i>Crassocephalum sp</i>	Asteraceae	Herb			x
63	<i>Croton macrostachyus</i>	Euphorbiaceae	Tree	Medicine (wound), beehive, beeforeage, injera pan polishing	x	x
64	<i>Cucumis prophetarum</i>	Cucurbitaceae	climber	Medicine for allergy	x	
65	<i>Cucur-bita pepo</i>	Cucurbitaceae	climber	food	x	x
66	<i>Culcasia fulcifolia</i>	Araceae	Herb		x	x
67	<i>Cyathea manniana</i>	Cyatheaceae	Tree	construction	x	x
68	<i>Cyperus sp.</i>	Cyperaceae	Herb	fodder	x	x
69	<i>Cyphostemma adenocaula</i>	Vitaceae	climber	Fence	x	
70	<i>Cyphostemma cyphopetalum</i>	Vitaceae	climber		x	x

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
71	<i>Datura arborea</i>	Solanaceae	shrub		x	x
72	<i>Datura stramonium</i>	Solanaceae	Herb		x	x
73	<i>Deinbollia kilimandscharica</i>	Sapindaceae	Small tree	Wedge, bedding in forest camp	x	x
74	<i>Diospyros abyssinica</i>	Dbenaceae	Tree		x	x
75	<i>Dombeya torrida</i>	Sterculiaceae	Tree	Bee forage, fiber, fuelwood	x	x
76	<i>Dorstenia soerensenii</i>	Moraceae	Herb			x
77	<i>Dracaena afronitana</i>	Dracaenaceae	Tree	bee forage	x	x
78	<i>Dracaena steudineri</i>	Dracaenaceae	Tree	Bee forage	x	x
79	<i>Ehretia cymosa</i>	Boraginaceae	Small tree	Farm implement, fuelwood	x	x
80	<i>Ekebergia capensis</i>	Meliaceae	Tree	Beehive hanging, beehive smoking, lumber, fuelwood	x	x
81	<i>Elaeodendron buchananii</i>	Celastraceae	Tree	Beehive hanging, farm implements, Zenezena	x	x
82	<i>Enbelia schimperii</i>	Myrsinaceae	climber	Fruit, tape worm, construction	x	x
83	<i>Ensete ventricosum</i>	Musaceae	Herb	Food, fiber, bedding, cleaning, shade	x	x
84	<i>Erythrina brucei</i>	Fabaceae	Tree	Live fence, hanging beehive, furniture	x	x
85	<i>Euphorbia ampliphylla</i>	Euphorbiaceae	Tree	Live fence, beehive, bee forage	x	x
86	<i>Euphorbia schimperiana</i>	Euphorbiaceae	Herb	Medicine (Kintaarot)	x	x
87	<i>Fern sp.</i>		Herb	seal beehive	x	x
88	<i>Fern sp. (handging from trees)</i>		Herb			x
89	<i>Ficus sur</i>	Moraceae	Tree	Beehive, beeforage, cuffin	x	x
90	<i>Ficus thommingii</i>	Moraceae	Tree		x	x
91	<i>Ficus vallis-choudae</i>	Moraceae	Tree		x	x
92	<i>Ficus vasta</i>	Moraceae	Tree		x	x
93	<i>Galiniera saxifrage</i>	Rubiaceae	Small tree	Bee forage, small mortar, farm implement, tool handle	x	x

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
94	<i>Garcinia buchananii</i>	Clusiaceae	Small tree		x	x
95	<i>Girardinia bullossa</i>	Urticaceae	herb	Hunting net, sack,	x	x
96	<i>Girardinia diversifolia</i>	Urticaceae	Herb			x
97	<i>Gouania longispicata</i>	Rhamnaceae	climber		x	x
98	<i>Guizotia scabra sbsp scabra</i>	Asteraceae	Herb			x
99	<i>Guizotia scabra sbsp schimperi</i>	Asteraceae	Herb	weed	x	
100	<i>Hagenia abyssinica</i>	Rosaceae	Tree		x	x
101	<i>Hallea rubrostipulosa</i>	Rubiaceae	Tree	Beehive, mortar, behive hanging, lumber	x	x
102	<i>Hibiscus sp</i>	Malvaceae	Herb		x	x
103	<i>Hippocratea africana</i>	Celastraceae	climber	construction	x	x
104	<i>Hippocratea goetzei</i>	Celastraceae	climber		x	x
105	<i>Ilex mitis</i>	Aquifoliaceae	Tree	Bee forage, beehive, fence, fuelwood	x	x
106	<i>Impatiens hochstetteri</i>	Balsaminaceae	Herb			x
107	<i>Impatiens rothii</i>	Balsaminaceae	Herb			x
108	<i>Impatiens tinctoria</i>	Balsaminaceae	Herb	Nail, hand and feet coloring	x	
109	<i>Ipomea sp.</i>	Convolvulaceae	climber	Medicine for diarrhia	x	x
110	<i>Ipomea tenuirostris</i>	Convolvulaceae	Herb		x	
111	<i>Isoglossa sp.</i>	Acanthaceae	Herb	fodder	x	x
112	<i>Jasminum abyssinicum</i>	Oleaceae	climber		x	x
113	<i>Justicia schimpertiana</i>	Acanthaceae	shrub	live fence, construction, vet medicine (leaf)	x	x
114	<i>Justicia sp.</i>	Acanthaceae	Herb		x	
115	<i>Kalanchoe sp.</i>	Crassulaceae	Herb		x	
116	<i>Keetia guenzii</i>	Rubiaceae	Small tree		x	x
117	<i>Landolphia buchananii</i>	Apocynaceae	climber	construction	x	x

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
118	<i>Lantana trifolia</i>	Verbenaceae	shrub	Gives good odor to milk utensils, seed as spice	x	
119	<i>Laportea alatisipes</i>	Urticaceae	Herb		x	x
120	<i>Lepidotrachelia volkensis</i>	Meliaceae	Tree		x	x
121	<i>Leucas martinicensis</i>	Lamiaceae	shrub	Medicine for allergy	x	x
122	<i>Lippia adoensis</i>	Verbenaceae	shrub	Medicine, milk flavouring	x	
123	<i>Lobelia giberroa</i>	Campanulaceae	Small tree		x	x
124	<i>Lobelia rhyncopetalum</i>	Lobeliaceae	small tree	Musical instrument for children, medicine (young shoot)	x	x
125	<i>Macaranga capensis</i>	Euphorbiaceae	Tree	Construction (mager)	x	x
126	<i>Maesa lanceolata</i>	Myrsinaceae	Small tree	Fence, fuelwood, beforage	x	x
127	<i>Manilkara butugi</i>	Sapotaceae	Tree		x	x
128	<i>Maytenus arbutifolia</i>	Celastraceae	Small tree		x	x
129	<i>Maytenus gracilipes</i>	Celastraceae	Small tree	Medicine for eye and fodder	x	x
130	<i>Maytenus undata</i>	Celastraceae	Small tree		x	x
131	<i>Melilotus suaveolens</i>	Fabaceae	climber		x	x
132	<i>Milletia ferruginea</i>	Fabaceae	Tree	Fish poison, beehive hanging, fuelwood, insecticide (mujaalee)	x	x
133	<i>Mimosa invasa</i>	Fabaceae	climber			x
134	<i>Morus mesozygia</i>	Moraceae	Tree		x	x
135	<i>Nicandra physalodes</i>	Solanaceae	Herb		x	
136	<i>Ocimum basilicum</i>	Lamiaceae	Herb	spice	x	
137	<i>Ocimum lamifolium</i>	Lamiaceae	shrub	medicine for allergy, diarrhea	x	
138	<i>Olea capensis</i>	Oleaceae	Tree		x	x
139	<i>Olea welwitschii</i>	Oleaceae	Tree	Bee hive, beehive hanging, beforage, farm implements, tool handle	x	

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
140	<i>Oncinotis tenuiloba</i>	Apocynaceae	climber	Fence	x	x
141	<i>Opilismenus hirtellus</i>	Poaceae	herb			x
142	<i>Oxyanthus speciosus</i>	Rubiaceae	Small tree	House construction, fence, fuelwood	x	x
143	<i>Paveta abyssinica</i>	Rubiaceae	Small tree		x	
144	<i>Paveta oliveriana</i>	Rubiaceae	shrub		x	x
145	<i>Pavonia urens</i>	Malvaceae	shrub	Fiber, forrage	x	
146	<i>Peperomia abyssinica</i>	Piperaceae	Herb	Medicine for stomach (hod menfat)	x	x
147	<i>Peponium vogeli</i>	Cucurbitaceae	climber		x	x
148	<i>Phoenix reclinata</i>	Arecaceae	Tree	Bee forage, food (fruit and shoot), handcraft,	x	x
149	<i>Phyllanthus ovalifolius</i>	Euphorbiaceae	shrub		x	
150	<i>Physalis peruviana</i>	Solanaceae	Herb	Fruit	x	
151	<i>Phytolacca dedocandra</i>	Phytolaccaceae	climber	Soap	x	x
152	<i>Pimpinella anisum</i>	Apiaceae	Herb	spice	x	x
153	<i>Piper capense</i>	Piperaceae	Herb	spice, medicine (Qurximat)	x	x
154	<i>Piper guineense</i>	Piperaceae	Herb			x
155	<i>Pittosporum viridiflorum</i>	Pittosporaceae	Tree	bee forage, fence, fire making (match)	x	x
156	<i>Polyscias fulva</i>	Araliaceae	Tree	Beehive hanging, beeforage, beehive making, fence, fuelwood	x	x
157	<i>Polystachya rivae</i>	Orchidaceae	Herb		x	
158	<i>Pouteria adolfi-friederici</i>	Sapotaceae	Tree	Bee forage, beehive, lumber	x	x
159	<i>Pouteria altissima</i>	Sapotaceae	Tree		x	x
160	<i>Prunus africana</i>	Rosaceae	Tree	Mortar, beehive hanging, vet medicine, tool handle	x	x
161	<i>Psychotria orophylla</i>	Rubiaceae	Small tree		x	x
162	<i>Pterolobium stellatum</i>	Fabaceae	climber	Vet medicine (skin diseases)	x	
163	<i>Pycnostachys abyssinica</i>	Lamiaceae	shrub	fuelwood	x	x



No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
164	<i>Rhamnus prinoides</i>	Rhamnaceae	shrub	Beverage making, live fence	x	x
165	<i>Ricinus communis</i>	Euphorbiaceae	shrub	Leather processing	x	x
166	<i>Rothmania urcelliformis</i>	Rubiaceae	Small tree	coloring handcrafts, fence, fuelwood	x	x
167	<i>Rubus apetalus</i>	Rosaceae	climber	fruit, house construction	x	x
168	<i>Rubus stuedneri</i>	Rosaceae	climber		x	x
169	<i>Rumex sp.</i>	Polygonaceae	Herb	Medicine (stomachae, eye)	x	
170	<i>Ruta chalepensis var. tenuifolia</i>	Rutaceae	Herb	spice	x	x
171	<i>Rytigynia neglecta</i>	Rubiaceae	small tree	Construction (mager)	x	x
172	<i>Saba comorensis</i>	Apocynaceae	climber		x	x
173	<i>Saccharum officinarum</i>	Poaceae	Herb	food	x	
174	<i>Salvia nilotica</i>	Lamiaceae	Herb		x	
175	<i>Sapium ellipticum</i>	Euphorbiaceae	Tree	Beehive hanging, fence	x	x
176	<i>Scadoxus nutans</i>	Amaryllidaceae	Herb		x	x
177	<i>Schefflera abyssinica</i>	Araliaceae	Tree	Beehive hanging, beehive, beeforeage, timber	x	x
178	<i>Schefflera myriantha</i>	Araliaceae	Tree	Construction	x	x
179	<i>Schefflera volkensii</i>	Araliaceae	Tree		x	x
180	<i>Senna petersiana</i>	Fabaceae	Small tree		x	
181	<i>Sesbania sesban</i>	Fabaceae	Small tree		x	x
182	<i>Setaria sp.</i>	Poaceae	Herb	fodder	x	
183	<i>Snowdenia polystachya</i>	Poaceae	Herb	vet medicine, fodder	x	
184	<i>Solanecio gigas</i>	Asteraceae	Tree		x	x
185	<i>Solanecio manni</i>	Asteraceae	Tree		x	x
186	<i>Solanum incanum</i>	Solanaceae	Herb	Medicine for eye	x	x
187	<i>Solanum tuberosum</i>	Solanaceae	Herb			x

No.	Scientific name	Family	Growth habit	Uses	Masha	Anderacha
188	<i>Strychnos mitis</i>	Loganiaceae	Small tree		x	x
189	<i>Syzygium guineense subsp. Guineense</i>	Myrtaceae	Tree	Bee forage, pole for house construction, fruit, fuelwood, water well part	x	x
190	<i>Teclea nobilis</i>	Rutaceae	Small tree		x	x
191	<i>Thalictrum rhynocharpium</i>	Ranunculaceae	Herb	fuelwood	x	
192	<i>Tiliachora troupinii</i>	Menispermaceae	climber	stomacache, house construction, bee forage	x	x
193	<i>Tiliacora funifera</i>	Menispermaceae	climber		x	x
194	<i>Trema orientalis</i>	Ulmaceae	Small tree		x	x
195	<i>Trichilia dregeana</i>	Meliaceae	Tree		x	x
196	<i>Trigonella foenum</i>	Fabaceae	Herb	food/ spice	x	
197	<i>Trilepisium madagascariense</i>	Moraceae	Tree		x	x
198	<i>Turraea holstii</i>	Meliaceae	Small tree		x	x
199	<i>Urera hypselodendron</i>	Uritaceae	climber	Vet medicine	x	x
200	<i>Vangueria apiculata</i>	Rubiaceae	Small tree		x	x
201	<i>Vangueria sp</i>	Rubiaceae	Small tree		x	x
202	<i>Vepris dainellii</i>	Rutaceae	Small tree	Fuelwood, poles	x	x
203	<i>Vernonia amygdalina</i>	Asteraceae	Small tree	Bee forage, fuelwood, fence	x	x
204	<i>Vernonia auriculifera</i>	Asteraceae	Small tree	bee forage, fence, fuelwood	x	x
205	<i>Vernonia dalettiensis</i>	Asteraceae	shrub		x	x
206	<i>Vernonia leopoldi</i>	Asteraceae	shrub	fodder	x	
207	<i>Vernonia sp.</i>	Asteraceae	shrub	Medicine (to stop thow out)	x	x
208	<i>Vernonia sp2.</i>	Asteraceae	shrub			x
209	<i>Vigna unguiculata</i>	Fabaceae	Herb	food crop	x	x
210	<i>Viscum congolense</i>	Viscaceae	climber		x	
211	<i>Zanha golumgensis</i>	Sapindaceae	Tree	Fuelwvod, fence	x	x

