WAYS OF KNOWING OF FARMERS AND SCIENTISTS

Tree and Soil Management in the Ethiopian Highlands

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STATEMENT OF DECLARATION

I hereby declare that this thesis has not been, and will not be, submitted in whole or in part to any other University for the award of any degree.

Signature……

Dedicated with love to my mother Theresia, with respect to my father Hermann, and to the memory of my grandparents.

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ACRONYMS AND ABBREVIATIONS

ADC	Austrian Development Cooperation
ADLI	Agricultural Development Led Industrialisation
AHI	African Highland Initiative
ANT	Actor Network Theories
AR	Ambober Researcher
ARARI	Amhara Region Agricultural Research Institute
BOKU	University of Natural Resources and Life Sciences, Vienna, Austria
CST1	Galessa, Case Study 1
CST2	Ambober, Case Study 2
DA	Development agent
DS	Development studies
EIAR	Ethiopian Institute for Agricultural Research
EFAP	Ethiopia's Forestry Action Research Plan
EP	Exclosure Project
EM	Exclosure Management
EPRDF	Ethiopian People's Revolutionary Democratic Front
FFW	Food for Work
FGD	Focus Group Discussion
FRC	Forest Research Centre
FRG	Farmers Research Groups
FWF	Austrian Science Fund
GARC	Gondar Agricultural Research Centre
GR	Galessa Researcher
GTP	Growth and Transformation Plan
GWP	Galessa Watershed Project
HARC	Holeta Agricultural Research Centre
IDRC	International Development Research Centre (Canada)
INRM	Integrated Natural Resources Management
IWM	Integrated Watershed Management
IWRM	Integrated Water Resource Management
KEF	Commission for Development Studies
MDGs	Millennium Development Goals
PASDEP	Plan for Accelerated and Sustained Development to End Poverty

PPP	PowerPoint presentation
PSNP	Productive Safety Network Programme
PWM	Participatory watershed management
RARC	Regional Agricultural Research Centre
REFAC	Research, Extension and Farmers Advisory Council
SRMP-NG	Sustainable Resource Management Program in North Gondar
STS	Science and technology studies
SWC	Soil and water conservation
WOARD	Woreda Office of Agriculture and Rural Development

EXPRESSIONS IN AMHARIC AND OROMIFFA USED IN THE TEXT

Ayyaana	Oromo World View: principles of nature (Kassam 1999)
Adbar	Sacred tree groves of Oromo people
Araqe	Very strong home-made alcoholic drink
Asmari bet	Places for folk singers to sing for an audience against payment, the songs are usually adapting to the audience and involve anecdotes told by some of the audience about others
Buda	Evil eye
Bunna	Amharic word for coffee
Erff	Essential component of the plough (the stilt)
Daga	Cool highlands (ca 2500 m)
Debo	Labour sharing group, important during harvest time
Degena	Special groves for annual ceremonies of Qemant
Farendj	Term for foreign people
*Gadaa/gad*a	Oromo age grade system
Gesho	*Rhamnus prinoides,* a shrub
Gimma	Soil in the hillside, not much depth
Got	Village
Gult	Income and labour rights during imperial regime
Idir	Savings group for funerals and for mutual help in need
Injera	Flat bread made from *teff*
Jarsuma	Council of the elders that resolves conflicts (Oromia)
Kebele	Lowest administrational unit in Ethiopia, sub-unit of a district
Kraemt	Main rainy season June to September (Ethiopian winter)
Maheber	Social institution, also translated as gathering, meeting
Meskal	Celebration of the True Cross, religious holiday
Mofer	Essential component of the plough (the beam)
Qallu	Spiritual groups known among Oromo people
Qemant	Ethnic group living in Amhara Region
Qole	Ghosts or spiritual beings, either positive or negative
Qolla	Lowlands (below 1800 m)
Rist	Land use right providing access to land during imperial regime
Saffuu	Oromo World View: moral order of culture (Kassam 1999)
Senbaté	Social institution

Serbolla	Mixed type of soil
Shimagelle	Elderly men, usually a respected member of the community involved in conflict resolution
Tabot	Holy Arc
Teff	Ethiopia's indigenous food grain (*Eragrostis tef*) used for flat bread (*injera*)
T'ella	*T'ella* is a local, home-brewn alcoholic drink resembling beer or cider
T'ella Bet	The house where *t'ella* is served to the public
Uumaa	Oromo World View: physical creation (Kassam 1999)
Waaqa	Expression for God in Oromo culture
Walka	Plain area with black soil
Wayna daga	Mid altitudes (1800 to 2400 m)
Woreda	District
Zar	Evil spirit

UNIVERSITY OF SUSSEX

Birgit Habermann

DPHIL DEVELOPMENT STUDIES

WAYS OF KNOWING OF FARMERS AND SCIENTISTS

Tree and Soil Management in the Ethiopian Highlands

Summary

The Ethiopian Highlands have been studied extensively, hosting a large amount of research for development projects in agriculture and forestry over several decades. The encounters in these projects were also encounters of different ways of knowing that were negotiated by the actors meeting in the space provided by the projects. This research explores these encounters and the social worlds they are embedded in, drawing on actor-oriented approaches as well as theories of narratives and framing. Ways of knowing and citizen epistemologies are taken as a lens to understand the role of identities in knowledge production and use.

The two case studies were agroforestry research projects in the Ethiopian Highlands. The research followed a range of qualitative and ethnographic research methods. Different types of farmers and scientists meet in the case studies. I recognise that they all have individual agency, nevertheless I use the terms 'scientist' and 'farmer' in this thesis. I use the terms to describe certain groups of actors who all draw on different ways of knowing, and different value systems, when interacting with each other and their environment.

The results indicate that the importance of social worlds at different scales and the contexts of research projects tend to be underestimated. In spite of good intentions scientific methodologies, terminologies and narratives tend to dominate. Scientists in the case studies acknowledged the existence of farmers' 'indigenous' knowledge, but they determined the value of knowledge by its scientific applicability and the replicability of experiments. Research systems force the scientists into a certain *modus operandi* with limited possibilities to experiment and to respond to the complexities and diversities of people's social worlds.

Farmers in the case studies preferred observation from their parents, observing from others or the environment as a way of learning and gaining knowledge. Depending on their personalities and their life histories they also relied on alternative ways of knowing rooted in spirituality, emotions and memories. Powerful influences on ways of knowing resulted from the way

languages and authority had been used. These often led to the exclusion of marginalised community members from access to knowledge and technologies.

Unfortunately, common narratives prevailed in the case studies, and alternative ways of knowing were often marginalised. By acknowledging different ways of knowing and the importance of different social worlds and different ways of doing research, both scientists and farmers could benefit and develop more sustainable pathways for agricultural and forestry land use.

1 INTRODUCTION

1.1 OVERALL ARGUMENT AND CONTRIBUTION TO THE LITERATURE

The debate about knowledge in development is polarised. There are groups who consider 'scientific' knowledge superior to the local or traditional knowledge systems of 'ordinary' farmers or citizens. There are others who support the opposite idea. And there are some who firmly believe that science will bring solutions to development problems all over the world, while trying to involve farmers in their research activities. And others still, try to work with farmers on a cooperative level where farmers become active agents of research.

In this thesis I explore what roles ways of knowing play in such encounters, where farmers and scientists meet in research projects on tree and soil management. I use ways of knowing as a means to understand how the intersection of the social worlds of farmers and scientists becomes a platform of sensitive encounters, (non-)debate, (non-)participation, (dis-) empowerment, learning and a (failed) opportunity for knowledge exchange. In spite of the fact that project proposals often make very similar promises regarding the participation of farmers, the level of cooperation between farmers and scientists differs vastly. Concepts such as participation are understood and interpreted in different ways from handing over decision-making to information sharing only. The willingness and motivations for farmers to cooperate are diverse. However, donors funding development projects, policy-makers deciding to support certain research ideas within their competence and scientists implementing research projects in cooperation with farmers or promising to do so often underestimate the diversity of knowledges, opinions, experiences and characters among farmers – and scientists themselves. And this diversity, together with the complex environmental situations the farmers live in, makes the planning and implementation of a successful research project in accordance with standardised criteria of donors a difficult task. I will therefore argue that the value of such standardised systems should be questioned, and that ideas for alternative ways of conducting agricultural research should be explored.

The 'alignment, compatibility, and flow of knowledge between researchers, policy-makers, and resource managers are often far from optimal' (Roux, Rogers, Biggs, Ashton and Sergeant 2006 'Introduction', para. 4). Scientists often appear to be part of an inward-looking culture, far from addressing 'real problems', not working at useful spatial and temporal scales, driven

merely by intellectual curiosity, not communicating effectively to non-scientists, and 'unable to contribute to the value-based debate that usually governs problem-solving in the real world' (Roux et al. 2006, 'The Historical Clash of the Cultures', para. 3). Moreover, 'science has been recognized as needing to accept its own cultural boundaries, frames and blinkers that obscure and patronize the intellectual and moral substance of other ways of knowing' (Leach, Scoones and Stirling 2007: 7-8). I will argue that it is not only science, let alone individual scientists, but rather the whole system of co-production of science and policies that ignores alternative ways of knowing. It is also the rigid academic and funding system that counts merit based on numbers and quantifiable results rather than on such salient outcomes as change processes and social transformations. And these are the contributions of science that prepare new pathways for sustainable development.

I argue that social worlds of farmers and scientists are rarely taken into account as salient aspects in research projects on tree and soil management such as the two case studies of this thesis. The challenges and opportunities, as well as historical representations and future imaginings differ strongly between farmers and scientists, but such differences play hardly any role in project planning and implementation. Research projects on tree and soil management in the Ethiopian Highlands are frequently based on the assumption that research is objective and disentangled from social lives; that its task is to bring new technologies or to 'upscale' existing ones, and to educate farmers about their perceived ignorance and mismanagement of trees and soil. Social aspects are taken up in research projects as 'participatory processes' that on the one hand seek to enrol farmers by informing and consulting them but on the other hand seek to extract information from them. Rarely do such projects engage in depth and over long periods of time with farmers and their ways of knowing. The two case studies in this thesis are examples where scientists have attempted such engagements, but it also shows the challenges they encountered in doing so.

I argue that many ambiguities, dynamics and uncertainties arise when farmers and scientists meet. The nature of the interfaces between scientists and farmers is embedded in a complicated network of coalitions, alliances and networks where different interests and different ways of knowing are negotiated, enacted and represented by the different actors involved. Thus communication, negotiation and representation of tree and soil management are deeply influenced by different interest groups and powerful narratives representing personal, political and strategic interests of different actors.

In this thesis I bring together theories of development studies and social studies of science, and a discussion of historical and ecological aspects of tree and soil management in the Ethiopian Highlands. I therefore contribute new ways of thinking to the debate about deforestation, degradation and soil erosion in Ethiopia, as well as providing new insights into the joint debate on social studies of science and development studies. In looking at research projects as case studies it combines a practical approach with theoretical analysis.

1.2 RESEARCH OBJECTIVES

In this thesis I aim to understand how the ways of knowing of farmers and scientists interact in research projects dealing with different aspects of tree and soil management in the Ethiopian Highlands. I look at the political, historical, ecological and social aspects of such research projects. I aim to highlight the importance of social worlds in the interaction of scientists and farmers, and I show how scientists struggle to dissociate themselves from social and political processes, while considering science a neutral and objective approach.

For this purpose I will first explain and analyse the approaches used in two case studies of research projects in the Ethiopian Highlands: the first approach is Integrated Watershed Management (IWM) and the second is Exclosure Management (EM). I will contend that applying general approaches developed in other contexts has problematic implications, and that these approaches leave little space for local ways of knowing and doing things.

As the discourse on research projects in development is often framed by debates about knowledge and epistemologies, I look in more detail at the ways of knowing of the different actors linked to the case studies. Here I want to specifically illuminate the role of different ways of knowing of farmers: I will look at the role of senses, spirituality, emotions, memories, languages, authority and exclusion. Furthermore, I will look at the intersection of the social worlds of farmers and scientists in terms of their epistemologies.

I will explore how actors have been enrolled in the research projects, and how the different actors negotiate about the projects, their knowledge and the implementation of research. I will argue that the role of relations, places and also modes of representation in such projects is a significant expression of power in the encounters of scientists and farmers.

1.3 RESEARCH QUESTIONS

In this thesis I explore the ambiguities, dynamics and uncertainties that arise when farmers and scientists meet. I try to understand how farmers and scientists engage when they meet in research projects, and if they are able to learn from each other. Furthermore, I explore whether this interface is perhaps an empty space where words and metaphors, symbols and goods are exchanged, without any impact on the actors' ways of knowing. I want to highlight whether farmers and scientists have similar or differing ideas and imaginings when talking about the management of trees and soil. The different framings, representations and interpretations of environmental degradation in the Ethiopian Highlands regarding trees and soil management in research projects are at the core of this thesis. To reach a better understanding of these issues this study asks three main questions:

Question 1: What epistemologies and narratives exist among farmers and scientists in tree and soil management in the Ethiopian Highlands?

This question is about the different forms of knowledges and ways of knowing that farmers and scientists are drawing on. It addresses how socially diverse farmers and scientists frame the agricultural systems they are living and working in. Differences in framing may depend on gender, ethnicity, wealth, disciplines, background, origin, education and other factors, as social worlds play an important role (Strauss 1978).

The literature on environmental degradation in Ethiopia (Hoben 1996) and the work of Leach and Mearns (1996) and Fairhead and Leach (1996) in West Africa help to illuminate how different narratives are constructed by particular scientists and farmers, and how these narratives are co-produced with political interests and forms of political and social authority. This analysis is guided by the work of Keeley and Scoones (2003) on knowledge and policy processes, as well as Jasanoff's work on the co-production of science and social order (2004). The findings related to this question can be found in Chapter 4 and are to some extent also addressed in Chapter 5.

Question 2: What social worlds and perspectives shape the nature of farmers' and scientists' understanding of trees and soil in the Ethiopian Highlands?

To provide answers to this question, I look at the different understanding of trees and soil that farmers and scientists have. The concept of social worlds (Strauss 1978; Gieryn 1995; Rival 1998) is applied to highlight differences and similarities in symbols, metaphors and stories

about trees and soil, where they originate and how they are articulated. The research uses different approaches to labelling, categorisation and quantification (Moncrieffe and Eyben 2007; Bowker and Star 1999; Porter 1994) to explore labels and possible categorisations that farmers and scientists use in tree and soil management. Finally, it makes use of Collins' and Evans' (2007) work to understand definitions of 'expertise' and/or 'science'. These explorations and analyses form parts of chapters 3, 4 and 5.

Question 3: What interfaces emerge between farmers and scientists in the case studies?

In addressing this question, I focus particularly on the roles and (re) workings of 'standardised packages' of research in the case studies. Standardised packages 'can be used by scientists to define their areas of expertise and power. It is through the use of standardized packages that scientists constrain work practices and define, describe and contain representations of nature and reality. [...] A standardized package is used as a dynamic interface to translate interests between social worlds' (Fujimura 1992: 205) as one of the interfaces where farmers and scientists meet. It examines how the social worlds of farmers and scientists intersect, how this affects ways of knowing of farmers and scientists, and how this is influenced by their social realities. Chapter 3 shows how the definition of roles and the enrolment of farmers also remain in the hands of the scientists. Chapter 5 discusses how standardised packages remain constructed by the scientists and that they emerge as a product of their social and professional realities.

Nevertheless at such interfaces, negotiations take place about different versions of histories, perspectives and views. Some stories remain hidden or are excluded and black-boxed by different groups of actors (Jasanoff 2004; Keeley and Scoones 2003). In Chapter 5 the approaches of Scott (1990), Jasanoff (2004), Keeley and Scoones (2003) and Callon (1986) will be used to analyse such processes, and which elements of scientific or farmers' narratives and different ways of knowing were reinterpreted or (selectively) adopted by the respective 'other'.

1.4 BACKGROUND

My research was inspired by my background in development research funding and policy advice and as a researcher in different parts of the world, which I describe in more detail below. These experiences led me to think more about how research is planned, funded and carried out under certain funding restrictions, as well as enabling factors, and in certain policy contexts. To understand more about this I had to look at a specific country context. I chose

Ethiopia as a case – the reasons why I selected Ethiopia are explained in 1.4.2. I selected two research projects funded by the Commission for Development Studies (KEF). Therefore in this part of the thesis I will first of all highlight three main contextual issues of this thesis: (1) my personal context; (2) the country context; and (3) the policy context.

1.4.1 FROM FARM TO UNIVERSITY AND BACK

I grew up on a farm, and I always felt close to nature, particularly through my grandmother's explanations about flowers and fruits, and my grandfather's obsession with edible mushrooms. Through this I became an environmentalist and later decided to study ecology. However, during my time at Vienna University I was surprised to hear how farmers were sometimes framed as 'enemies of biodiversity', and specific trees (fir) and crops (maize) were framed as 'bad'. I did not understand how professors of botany could come to this conclusion. Later I came across *Ailanthus altissima* in Pakistan, where I went for a training project and my master's thesis for my ecology degree. This tree was seen as an invader by scientists, but deemed very useful by the farmers. The fiercest debate I heard during my studies was probably the one concerning eucalyptus. Eucalyptus in my memory from that time is really an 'evil tree' that drains all the water from the soil and because of its allopathic effect destroys all other plants in its vicinity. In all these cases the trees (fir, *Ailanthus altissima*, eucalyptus) played a very important role for the farmers. Of course, there is a valid debate about eucalyptus. For example, there are studies in Ethiopia that claim that eucalyptus has a negative effect on *Eragrostis tef* (Michelsen, Lisanework and Friis 1993). However, some other studies have shown the benefits of eucalyptus under proper management (Hailu 2002; Pohjonen and Pukkala 1990).

What really led me to become a more critical thinker later on was the recognition of my own blind way of following such narratives. During my second stay in Pakistan I felt embarrassed about what I had written the first time; it seemed to me arrogant, ignorant and useless. The difference was that the second time I had much more time to spend in the villages, and many long walks and long conversations with the farmers.

From 2004 to 2008 I was working as a funding manager and researcher for KEF at the Austrian Academy of Sciences. By comparing different funding systems for development research all over the world, I developed funding guidelines based on scientific quality, relevance for development and sustainability (see Appendix 1). But I learned quickly that those laudable principles in reality had to be handled quite flexibly. The actual definitions of these terms were

on the one hand narrow, but in implementation they were understood quite broadly. The board members at that time were mostly senior scientists who were acting and deciding in accordance with their own 'reality' and perception of developing countries. As the Austrian academic system traditionally was very hierarchical it was difficult to challenge such notions that were often generalising with little regard for social issues.

Our arguments and the way we phrased them were influenced by the actors behind the programme, that is, the board members, but also very much by the policy context we were operating in. In my research for this thesis I realised that not only the policy context in Austria as well as global policy frameworks, but also the policy context of the partner countries played an important role in the context of the research projects in shaping the agenda and priorities of the researchers in the countries.

The modes of decision-making, the evaluation systems of the projects and how they presented themselves in their reports, as well as my own experiences in research projects, led me to think more critically about the nature of research projects. In the projects I had been working for there were sometimes serious misunderstandings about project objectives and intended outcomes, our mutual roles and, most of all, the role of farmers. Farmers were reduced to information sources and objects of the research rather than active agents. The issue of partnership and capacity building in contexts where issues of power determine modalities of actors' enrolment became critical for me. Equally, what kind of knowledges matter for the projects and what happens to them during the projects were issues that I wanted to understand better.

Observations on the processes of evaluation as well as the contents of the proposals and the reports inspired me to carry out research on the ways of knowing of farmers and scientists in KEF projects. The gap between project designers' original intentions, their final outputs and the many issues raised informally but never in official reports, were my main motivations to take a critical analytical look at such projects in order to understand the roles of ways of knowing in such encounters.

1.4.2 WHY ETHIOPIA?

Interest in how Ethiopia is using its natural resources is high, especially given the fact that its river system connects Ethiopia to its neighbours Sudan, Kenya and Egypt, with potential for conflict over the use of these natural resources, particularly regarding the Blue Nile river (Swain 1997). And this is one example how tree and soil management is framed in Ethiopia: the story of the Ethiopian soil vanishing and being given 'for free' to Egypt because of the 'bad management practices' of the farmers is persistent and omnipresent, from the conference hall to the farmyard.

At the time when I had to select a case study for my research, the Austrian Development Cooperation (ADC) designated €8.20 million for Rural Development and Support to Food Security, that is, 28% of the total budget given to Ethiopia (€30 million) (ADC 2007). Ethiopia is a priority country of the ADC and therefore there is a focus on Ethiopia on the research side as well. Austria supports research cooperation in rural development in Ethiopia, and the majority of scholarship holders at Austrian universities financed by the ADC come from Ethiopia (Berger 2006). Most of the projects funded by KEF are located in Ethiopia.

When I developed this project idea, I was still working as a funding manager at KEF. I contacted the project managers of projects related to trees and soils in Ethiopia. I soon got the consent of the leaders of two interesting projects. KEF was also interested to learn more about the questions I was asking. At KEF I had also led a research project that developed an exhibition about research cooperations with Ethiopia, looking at historical and present developments. Furthermore, as part of one of my research projects and for my job at KEF I had already visited Ethiopia in 2004 and 2008. All of this provided me with a solid background about Ethiopia and a suitable context to study the interaction of different scientists (Austrian and Ethiopian) as well as farmers and scientists in agricultural research projects.

1.4.3 NARRATIVES ON LAND DEGRADATION

Land degradation is a complex issue in the Ethiopian Highlands – it touches political, historical, ecological, geological, demographic and many other aspects of natural resource management. Yet complex stories and uncertainties are difficult to process into development policies and strategies. This has also been pointed out by Roe (1991:288):

> Rural development is a genuinely uncertain activity, and one of the principal ways practitioners, bureaucrats and policy makers articulate and makes sense of this uncertainty

> is to tell stories or scenarios that simplify the ambiguity. Indeed, the pressure to generate narratives about development is directly proportional to the ambiguity decision makers experience over the development process. The more uncertain things seem at the microlevel, the greater the tendency to see the scale of uncertainty at the macrolevel to be so enormous as to require broad explanatory narratives that can be operationalized into standard approaches with widespread application.

The oral and written documentation of the agro-ecological, social and political history of the Ethiopian Highlands is not accessible to most non-Ethiopian development practitioners and foreign scientists. The documentations of European travellers are in most cases biased – these trips were most of the time funded either in a religious, missionary context, or the donor funding the expedition had military interests (e.g. Jerónimo Lobo, a Jesuit missionary around 1630; Richard Lepsius for the German Emperor Friedrich Wilhelm IV 1842 – 1845; Heinrich Barth and John Martin Bernatz on behalf of the British Government 1849 – 1855). Feelings of uncertainty and ambiguity regarding the 'development needs' of the Ethiopian Highlands among non-Ethiopian development practitioners and foreign scientists could indeed have prepared the ground for the development of such explanatory narratives that Roe (1991) is referring to.

There are however some dominant paradigms as to what the Ethiopian Highlands looked like before supposedly being 'destroyed by human beings' – an image of a paradisiacal landscape that was full of trees and wildlife, lush and green, a land of milk and honey, is represented in museums such as the National Museum and the Ethnographic Museum in Addis Abeba. According to Hoben (1995:1008) there are such 'historically grounded, culturally constructed paradigms that at once describe a problem and prescribe its solution'. He then continues to explain that many such paradigms are

> rooted in a narrative that tells us how things were in an earlier time when people lived in harmony with nature, how human agency has altered that harmony, and of the calamities that will plague people and nature if dramatic action is not taken soon. It is not surprising that the narratives remind us more or less explicitly of the fall from Eden (Hoben 1995:1008).

Greener Ethiopia in a video[1] also talks about how Ethiopia from a forested, fertile land has turned into a desert and that the time has come to avert the coming catastrophe threatening the country. In other representations the loss of Ethiopia's great natural resources is lamented in the wider debate around land degradation:

[1] http://www.youtube.com/watch?v=ZNX9mk90Qto.

> Though endowed with a great wealth of natural resources, Ethiopia is facing the challenge of this natural resource degradation at an alarming rate. The country, having a total area of 1.24 million sq.km with a population of 66 million, is an agrarian country, where agriculture is the backbone of the economy in which 86% of the population are engaged. The diversity of the soil and climate of the country on one hand is considered as a wealth endowed […] (Debelo 2002:5)

This quote is taken from an opening address of a conference on challenges on land degradation in Ethiopia. The speaker represented the Ethiopian Institute for Agricultural Research (EIAR). He emphasises three main points:

- Ethiopia has a great wealth of resources, and a high diversity in soil and climate.
- The degradation of the resources is taking place at an alarming rate.
- Agriculture is the backbone of the economy. Most people are working in agriculture.

Similar statements can be found in the documentation of other conferences and workshops on natural resource management in Ethiopia (compare for example Tilahun and Eylachew 2003; Admassu et al. 2008a; ESSS 2009). Like the speaker above, many others also stress that agriculture plays a very important role for the Ethiopian economy:

> In Ethiopian [sic!], agriculture underpins the key livelihood strategies for people living in rural areas, while equally contributing to the national economic development by providing employment and income.
>
> Despite the fact that the bulk of agricultural planning and implementation takes place in the face of the deep rooted spiral of land degradation; including soil erosion, deforestation, loss of biodiversity and other forms of natural resources degradation. Soil erosion is taking place at the rate of 1.5 billion tones [sic!] annually while deforestation is taking place at a rate of about 20,000 of hectares per annum.
>
> (ESSS 2009:11, Opening Speech of State Minister, Natural Resources, MoARD)

This statement includes two other important points of reference regarding land degradation in Ethiopia: one is the rate and extent of deforestation, and the other the rate and extent of soil erosion. Regarding this, a similar account like above was given by the Director General of the Ethiopian Institute of Agricultural Research at the workshop 'Working with Rural Community for Integrated Natural Resources Management' at Holeta Research Center on 28-29 February 2008 in his opening address:

> Land degradation, especially soil erosion, declining soil fertility, deforestation, poor land management cultivation practices, increasing number of population, and the load of poverty on environment deterioration, are the main features observed in the Ethiopian agricultural sector in particular and the sub-Saharan countries in general. For instance, 2/3 of the population of Africa is affected by land degradation. In Ethiopian highlands, soil erosion on cropland averages 42 tons per hectare per year and it is much higher on steeper slopes. If this soil erosion rate continues, more than 6 million hectares of additional crop

> and pastureland will become unusable. The gross discounted cumulative cost of erosion in Ethiopia has been estimated to be as high as $1.25 billion/year. (Admassu et al. 2008a:iii)

In addition to soil erosion and deforestation this speaker mentions another frequently stated part of the narrative on land degradation in Ethiopia: the role of population growth and poverty as well as what he calls 'poor land management practices'. Other authors provide numerous explanations about the reasons for what is both described and contested as a problem of overpopulation and degraded lands due to overgrazing, soil erosion and deforestation (e.g. McCann 1995; Hoben 1996; Jacobs and Schloeder 2001; MoFED 2006). Leach and Mearns (1996) looked at the origins and persistence of received wisdom on the African environment. They explain that theory and methods are often hard to distinguish, and that certain methods gain sufficient authority to prioritise some created facts over other kinds of evidence that thus become excluded and dismissed. This practice is particularly reinforced by commonly accepted scientific ways of knowing.

The narrative constructed in relation land degradation in Ethiopia speaks of the alarmingly increasing destruction of natural resources, specifically trees and soils, across the Ethiopian Highlands. It presumes that there was a stage in history, not too long ago, where the Ethiopian Highlands looked lush and green, covered by high forests, without much signs of soil erosion. The narrative also presumes homogeneity across space and an increase across time: it presumes that the 'destruction' of the fertile and productive land in the entire Highlands took place in a relatively short time span. This time span is often dated between 50 to 150 years before present time. The culprits for this rapid destruction are in many cases farmers due to poverty, presumed lack of knowledge and presumed lack of awareness. I would therefore like to further discuss this narrative in three subsections focusing on 1) soil erosion; 2) deforestation; 3) poverty and land degradation linkages.

1.4.3.1 Debating Narratives on Soil Erosion in Ethiopia

Cushitic-speaking farmers first domesticated local grasses in present-day Ethiopia, and Semitic peoples made the ox-plough system their trademark (McCann 1995). Ethiopia's geological past was influenced by volcanic activity, and the soils result from the decomposition of the volcanic material, but these soils have over time been mixed by floods and wind, and diversity within one farming system can be high (McCann 1995). However, Ethiopian soils are rarely mentioned without immediate reference to rapid and presumably recent soil erosion, severe degradation and their effect on food security.

> For decades rural households and local communities in the Ethiopian highlands have suffered from increasing food insecurity. High population growth and small farm sizes have resulted in massive land degradation. In many areas, the creation of gullies and sheet erosion on sloping hill sides has led to high losses of fertile soil. Thus today, many rural families can barely make their living out of agriculture. (GTZ 2007:15)

During interviews with scientists and in presentations at conferences and workshops that I attended in Ethiopia soil erosion in the country was characterised as alarmingly high. During presentations this was emphasised by quoting number (see below) and by showing photographs of denuded hillsides with deep gullies; other forms of severe gully erosion; sheet erosion as effect of overgrazing; and photographs of sediment-carrying rivers (for example at the workshop described in 5.3.1). Photographs produced a particularly spectacular effect when they showed how yellow-brownish water entered a clear-blue coloured lake. In this context the presenters often used the opportunity to point out that a lot of sediment was transported to Egypt 'for free' via the river Nile, a statement I also encountered in media and political statements regarding the river Nile and soil erosion in Ethiopia.

In publications there are diverging numbers found regarding soil erosion in the Ethiopian Highlands. Original predictions for soil erosion rates were as high as 130t/ha/year from cropland (FAO 1986 and Hurni 1988 cited in Tesfaye 2012).[2] This would equate to an average loss of 2.5 cm topsoil per ha/year (Birru 2002 cited in Tesfaye 2012). Birru (2007) reports rates between 15–25 and <60 t/ha/year in different parts of Lake Tana Basin. However, other reports often take such numbers out of context of the actual research done: Nyssen, Poesen, Deckers, Mitiku Haile and Lang (2004: 28) warn that the 'presentation of data in tables with estimated mean soil loss per type of land use and popularisation of the adapted USLE (Hurni, 1985) may lead to the use of these tools for analyses for which they are not intended.' Furthermore, many authors blame land degradation and soil erosion on poor farming practices (e.g. Tesfaye 2012). Nyssen et al. (2004) summarise the main reasons as follows:

> The magnitude of erosion processes in the Ethiopian highlands finds its cause in the combination of erosive rains, steep slopes due to quick tectonic uplift during Pliocene and Pleistocene and human impact by deforestation, an agricultural system where the openfield dominates, impoverishment of farmers and stagnation of agricultural techniques (Ståhl 1974, 1990, Girma and Jacob 1988). (Nyssen et al. 2004: 16)

Later on they mention the complex climatic conditions and high rain erosivity that is higher in the Ethiopian Highlands than anywhere else in the world (Nyssen et al. 2004). Hurni

[2] The author does not list these two publications in his bibliography, so I could not include the original sources in my references.

emphasises the effect of hailstorms and hillslope aspects (Hurni 1979 cited in Nyssen et al. 2004). However, in spite of all these challenges there is still a thick soil cover remaining, due to the 'overall low soil erodibility, high rock fragment cover and awareness of soil erosion problem by farmers (Nyssen 2001)' (Nyssen et al. 2004: 16). The latter is also emphasised in the Ethiopian Highlands Reclamation Study: 'The farmers are generally aware of erosion and land degradation problems. More than half have noticed erosion of top soil, decrease in proportion of trees and grass, increase in number and size of gullies, and decreasing water supply' (Admassie, Abebe, Ezra, Gay 1983: iv). As Hoben (1995:1009) summarises, 'the neo-Malthusian environmental narrative […] exaggerates the rate and magnitude of degradation and misrepresents the role of human agency in causing it, but there can be no doubt that there are serious problems of soil erosion in extensive areas of highland Ethiopia.'. Thus, while there is indeed a problem of soil erosion in parts of the Ethiopian Highlands, soil erosion is often wrongly framed as being the prime cause for the impending destruction of large parts of agricultural land of the Ethiopian Highlands.

1.4.3.2 Debating Narratives on Deforestation in Ethiopia

Looking at historical sources and present-day landscapes and talking to farmers brings into question the deforestation myth that there was still at least 40% forest cover about 100 years ago. For the Ethiopian Highlands this view must be contested, as some authors have already done (McCann 1995; Nyssen et al. 2004). The vision of the Ethiopian Highlands being a place naturally lush and green and turned into a 'desert' by human beings has been strongly reinforced if not manifested by a campaign emerging from the Ethiopian Millennium.[3] A nationwide campaign was launched at that time to plant trees all over the country. The target was for every Ethiopian to plant two trees. Schools, research organisations, universities, NGOs, ministries, indeed everyone was encouraged to plant at that time - it was framed as a question of national pride. This campaign was also strongly supported at the highest political level. However, afterwards many critical voices were heard because those trees were planted but not looked after and did not survive long.

The land use history of Ethiopia and the history of Ethiopia's Highland forests are more complex than reflected in representations as used by the Millennium Campaign. Originally, the

[3] Ethiopia follows a calendar that is different by seven years from the Gregorian calendar. 2000 in the Ethiopian calendar was 2007 in the Gregorian calendar.

Highlands were covered by open grasslands, scattered wooded savannah, moist evergreen montane forests and tall broadleaf hardwoods (McCann 1995). But,

> Interaction with the highlands' vegetative cover with the ox-plow complex has brought significant changes. Under the influence of the plow, virtually all the northern highlands' dry evergreen forests and grasslands and a large part of the moist evergreen forests have changed to open farmlands and pasture. (McCann 1995: 36)

McCann's version is different from the more common narrative, or as he calls it a 'deep-seated mythology' (McCann 1995: 36), which has also been prominently disputed by Clapham (1988). This myth claims that within the 20th century forest cover in Ethiopia has dropped from 40% to 4%. McCann traces the origin of the myth back to Huffnagel (1961); some colleagues in Ethiopia claimed it originated from the work of Friedrich von Breitenbach who was working for the UN in Ethiopia in the early 1960s (Van der Dussen 1995).

Chojnacki (1963) bases his analyses on reports of travellers. According to him, the hills of Shoa were still covered with bushes or small forests in medieval times. The exceptions were royal residences: the kings at that time were moving from place to place, depending on the extent of exploitation of wood resources around their camps and for political reasons (Chojnacki 1963). The first travellers at the beginning of the 19th century 'found the land covered with farmers but very impoverished in forests' (Chojnacki 1963: 33).

According to McCann (1995) agriculture in the Highlands was characteristically in landscapes without forests, at least since the 16th century. Charcoal-making first appeared 2,500 years ago, and the use of dung for fuel has also been known for at least 400 years (McCann 1995). According to von Breitenbach (1961: 11), Highland forests originally 'completely covered the plateaux in these altitudes of Woina Dega.[4] After thousands of years of land clearing and forest exploitation, however, they are found there as remnants only, generally forced back to the inaccessible mountainous escarpments of the plateaux.' Only in the west and south, in areas of less population density, larger forest areas of this type remained (Von Breitenbach 1961). Some authors claim that deforestation started in the 16th century (Pohjonen and Pukkala 1990; Horvath 1968), or at least much earlier than the last century (Nyssen et al. 2009). Nyssen et al. (2004: 24) report, based on 14th-century measurements, that deforestation started

[4] He is referring to 1,800 to 2,300 m in drier regions, and 1,400 to 2,600 m in humid regions. A more general definition is provided by McCann (1995): Daga are the cool highlands (ca 2,500 m), Wayna Daga the mid-altitudes (1,800 to 2,400 m), and Qolla the lowlands (below 1,800 m). Daga is sometimes transcribed as 'Dega'. I use the more common transliteration of 'Wayna' rather than 'Woina'.

around 5,000 years BP, but 'Since the 20th century, vegetation removal, however, concerns also shrubs and small trees, as well as grass strips in between the fields and on steep slopes.' This is also the main reason for the rapid increase in gullies in some areas (Nyssen et al. 2004). Moges and Holden (2009) show how the removal of vegetation has increased gully development between 1965 and 2000 in Sidamo. Indeed the severity of soil erosion and the fast pace of gully development in many parts of Ethiopia is visible even to the occasional visitor. However, there is evidence that in some parts of Ethiopia, especially Tigray, there has been an increase in vegetation and tree cover during the last 30 to 40 years (Munro, Deckers, Haile, Grove, Poesen and Nyssen 2008), and that rehabilitation of degraded lands is possible. This trend, however, does not hold true for areas of remnant forest areas; it seems that the existence of those trees gives the impression that conservation and rehabilitation is less important in such areas, and while rural areas in Tigray are coping well with fuelwood supply, another problem is the still growing demand for wood in urban areas (Munro et al. 2008).

Eshetu and Högberg (2000a) come to the interesting conclusion that parts of Menagesha Forest (now a national park close to Addis Ababa) were once deforested, and that the present forest areas have been there for more than 550 years. This evidence was based on the study of 13th-century abundance in soils. Eshetu and Högberg (2000b: 109) show that tall forest ecosystems could regenerate on 'fairly steep slopes at Menagesha after a long period of grass vegetation cover or cultivation'. Their results are also congruent with oral history and palynological studies, and they are valid evidence that 'Ethiopian forest history is more complex than commonly appreciated, and that there has not been a simple unbroken trend of deforestation' (Eshetu and Högberg 2000a: 83). This was also emphasised by the observations of present-day Ethiopians during my interviews and other personal encounters[5]. Those growing up in urban areas reported that they had seen trees and forests disappear from towns and adjacent areas at rapid pace over the last 20-30 years – at the same time forest areas in rural areas have in some cases increased. And particularly eucalyptus plantations have amplified both in urban and rural areas.

[5] Many Ethiopians who learned about my research topic would comment on the issue on deforestation in telling me their observations as noted above.

The original forest vegetation in the highlands was more diverse than is often represented. In many areas it did not resemble high forests as desirable for forest management according to European standards: in Galessa area present-day Chilimo Forest gives a good impression of the potential forest cover in this area with dense forests of *Juniperus procera*, *Podocarpus falcatus*, *Hagenia abyssinica* and many others (see Figure 1.1). But in the area of Gondar forest land characteristically was Savannah bushland interspersed with a smaller number of high trees such as *Olea europea* subsp. *cuspidata*, different acacias and *Ficus* species (see Figure 1.2, 1.3, 1.4).

Figure 1.1: Chilimo Forest near Ginchi and Galessa, West Shoa, Oromia Region (May 2009).

Figure 1.2: Savannah forest land adjacent to farm land in Ambober, North Gondar, Amhara Region (March 2010).

Figure 1.3: Remnants of savannah forest in Ambober, North Gondar, Amhara Region (March 2010).

Figure 1.4: Protected forest area in Ambober (Workamba) since the 1980s (July 2010)

1.4.3.3 About Poverty and Land Degradation Linkages

The work of Shiferaw and Holden (1997, 1998 and 1999) is frequently quoted (e.g. Tesfaye 2012, Birru 2007) to emphasise the role of farmers in land degradation in Ethiopia. Shiferaw and Holden try to explain the rationality of farmers to contribute to land degradation 'due to soil erosion and nutrient depletion through exploitative production (soil mining)' (Shiferaw and Holden 1997:280). However, the authors also attempt to discuss other factors, for example how wrong policies (e.g. in cutting subsidies for fertilisers, see Shiferaw and Holden 1999) force farmers into certain 'harmful practices'. Yet in the work that refers to them that I

encountered they were mostly quoted for their statements on the farmers' contributions to the problem of land degradation by their 'improper or inadequate agricultural practice', for example in Tesfaye (2012:1):

> […] soil degradation, due to deforestation, over grazing and improper agricultural practice, has become the basic challenge constraining smallholder farmers from achieving the aforementioned goals (Hurni, 1993; Sutcliffe, 1993; Shiferaw and Holden, 1998; Pender, 2001).

As 'goals' he is referring to agricultural intensification as a 'prerequisite for economic development and food security' (Tesfaye 2012:1) in Ethiopia. Shiferaw and Holden in their work are also referring to another argument to blame farmers for land degradation: according to them farmers are basing their decisions on a cost-benefit analysis economic returns versus conservation (Shiferaw and Holden 1999). This is a frequently used simplified representation of the poverty-degradation narrative contested by other authors such as Crewe and Harrison (2000). Narratives of agricultural production versus conservation and sustainability have also been taken up by actors and institutions belonging to the development sector such as the World Bank and GIZ:

> Ethiopia's inherently fragile soils, undulating terrain, highly erosive rainfall and the environmentally destructive farming methods that many farmers practice make it highly vulnerable to soil erosion. Moreover, nearly one-third of the agricultural land is moderately to strongly acidic because of damaging farming practices. The causes of land degradation are complex and diverse. First, the heavy reliance of Ethiopia's rapidly growing population on unsustainable subsistence agricultural practices is a major cause of land degradation. (World Bank 2008:5)

Although the World Bank in this document is providing a list of four major reasons for land degradation, farmers and their agricultural practices come first on the list. Other reasons listed are the high dependence on wood and other biomass as prime source of household energy; poor livestock management; and land tenure insecurity (World Bank 2008: 5-6). These reasons (except for the last one) put the blame on the farmers. In other documents I found reference to the presumed lack of awareness among the Highland farmers:

> The SUN-Program serves as a facilitator for these activities and agricultural experts provide training for watershed management. However, they do not only teach community members how to build a check dam, or plant grasses and trees to prevent the gullies from further breaking off. They also make them aware of the negative consequences that the continuing soil degradation could have on their lives. To know such facts is sufficient motivation for the people of the affected areas: equipped with tools, stones and seedlings provided by SUN, they get to work themselves and for themselves. (GTZ 2007:14)

The simplification that poverty is the main reason for environmental degradation can be found to some extent in the work of Shiferaw and Holden (see above), but also others use this as an argument:

> Then, because of their growing depletion and even extensive abuse, the poor, in some important ways, have damaged the environment. To use a figure of speech, it often has meant cutting the ground from under their feed from the consequences of poverty, environmental degradation and development merry-go-round. The end result of this syndrome is that the poor continue to carry the brunt end of land degradation. Therefore, being forced by circumstances beyond their control, they now serve as agents of their own undoing and are principal victims due to the vicious circle of underdevelopment. […] This view recognises the reality that it is poverty and not ignorance that is the root cause of environmental problems. (Mesfin 2003:9)

This view has been contested by authors in other parts of the World such as Khan and Khan (2009), Dasgupta, Deichmann, Meisner and Wheeler (2005) and Tran, Marincioni, Shaw (2010). In many parts of the World the view is held that 'due to poverty and the meeting of subsistence needs the poor use natural resources more intensively and hence cause them to degrade' (Khan and Khan 2009:2607). The above mentioned authors provide empirical evidence that dispute simplified linkages between farming and forest management practices of local farmers and environmental problems such as deforestation, flooding, soil erosion. The roots of land degradation in their examples lie in various forms of landownership (Khan and Khan 2009), institutional and market failures, inadequate policies, and lack of incentives for sustainable management (Dasgupta et al. 2005), climatic variability and infrastructure development (Tran et al. 2010).

1.4.3.4 Land Use Changes and Politics

The agricultural system in the Highlands was always deeply intertwined with the political system: the imperial government in its expansion gave out land and labour rights (*rist* and *gult*) in occupied areas, and thus assured loyalty, income and the spreading of its agricultural system (McCann 1995). However, military success was the way upwards in the society of Northern Ethiopia – successful cultivation and agriculture were not leading towards promotion (Hoben 1995). Farmers held land rights that were either hereditary (*rist*) or they ploughed land owned by kings, lords, monasteries or older relatives (Levine 1965). The second significant type of land right during imperial times was *gult*: 'Members of the secular elite held quasi-feudal land rights (Amharic *gult*) over peasant communities that entitled them to rule and tax their subjects but not to treat the peasants as tenants or tell them how to farm.' (Hoben 1995:1009). However, both types of landownership did not guarantee any land security: land

titles often did not last long, therefore it is not surprising that the economic strategy of the feudal lords was on extraction rather than investment (Hoben 1995).

Thus, the ox-plough system continued to evolve without much innovation, as in contrast to their European counterparts the Abyssinian feudal lords took no interest in the actual production systems at the farm level: the crops and the ox-plough system stayed more or less the same until the 20th century (McCann 1995). However, Francisco Alvares in the 1520s, Jerónimo Lobo in 1626 and Henry Salt in the 19th century similarly describe the Ethiopian Highlands as rich and beautiful, with sufficient agricultural production and benign climatic conditions (McCann 1995). In the late 20th century something seems to have changed:

> A culture is dying in Ethiopia. A complete way of life, virtually unassailed for 3000 years, is coming to an end. The Abyssinian high plateau, known to the Greeks as a 'cool celestial island', is rapidly turning to dust, merging wearily into the barren and stony deserts that surround it. (Hancock 1985: 7 cited in McCann 1995: 4)

The Ethiopian agricultural system experienced a crisis starting from the late 19th century, when the previously successful system that had provided for kings and their armies for centuries started to decline (McCann 1995). To date, explanations are still being sought for this decline. Vandiver (1952) seeks explanations for the perceived problems in rural development in Ethiopia in the lack of motivation of farmers: 'Incentives toward production have been weak, partly because the feudal tenure systems have offered little reward for effort. Also, the emphasis upon numerous religious holidays often conflicts with an efficient routine of agricultural tasks' (Vandiver 1952: 279).

It is amazing that this narrative is still audible in present-day Ethiopia, in spite of the fact that 60 years have passed and enormous political changes have taken place in the meantime. However, Vandiver may be right in saying that the 'peasantry has not only maintained its own subsistence but at the same time has supported the large number of priests, monks, the military, the provincial and national leaders, and their often quite impressive retinues' (Vandiver 1952: 280). This may indeed have had an influence on land management, and the incentives for different land management scenarios involving trees and forests may have been low, especially as the superiors mentioned by Vandiver demanded primarily grains from the farmers, and first and foremost *teff* (*Eragrostis tef*, indigenous grain used for flat bread). This has, however, changed in the last century. Barley especially has lost its previous significance (McCann 1995), and more and more new crops have been introduced such as rice and potato.

A particularly remarkable increase can be seen in maize, which also has increased economic and environmental risks for the farmers (McCann 1995). The main reason for the perceived crisis, however, does not come from agricultural practices, but from a substantial change in the whole agricultural system resulting from the start of urbanisation at the beginning of the 20th century (McCann 1995). The increasing demands of rapidly growing urban populations have altered the whole status of the agricultural production system and have created a whole new different market system for agricultural products; however, political support for agricultural producers has been low in terms of technical support and access to improved varieties, fertilisers etc. (McCann 1995) – a pattern that persists to date when provisions of extension advice and agricultural inputs are still problematic and political.

Moreover, the experiences of farmers during the imperial regime (until 1974) and the Derg regime (1974–91) in relation to tree and soil management are reflected in their current framings of technologies: in both regimes trees were not an accessible resource for farmers. The modest attempts at modernisation during the later years of the imperial regime came to a stop during the Derg regime (McCann 1995). Farmers were forced to engage in 'food for work' schemes where new technologies for afforestation and soil conservation were imposed, and problematic property rights continued to prevent the adoption of new technologies by the farmers (Admassie 1995). Such coercive approaches by

> various regimes of governance in the process of introduction of improved land management practices and technologies in the past must be taken into account as one of the reasons for the failure of adoptions and adaptations of the practices and for the downward spiral trends of land degradation in the highland regions of the country. (Birru 2007: 191)

In addition land ownership regulations play an important role in the debates around land use and related policies in Ethiopia:

> Land policy, the real source of power in imperial and contemporary Ethiopia, remains at the center of a controversial policy debate. The debate has largely been carried out along two antagonistic arguments concerning property rights to land. The Ethiopian government continues to advocate state ownership of land whereby only usufruct rights are bestowed upon landholders. The usufruct rights exclude the right to sell or mortgage the land. This, the government asserted, was to protect the rural peasants from selling off their land to wealthy individuals leaving them landless and without source of livelihoods. The government builds its argument on the premises of social and historical justice that is based on two principles: (1) justice understood as egalitarianism – guaranteeing every farmer in need of agricultural land equal rights of access to such land, and (2) historical justice – granting tenure security to the Ethiopian farmer's who had experienced land deprivation

> and land expropriation through different mechanisms during the imperial era. (Crewett, Bogale and Korf 2008: 1)

State ownership of land was established under the Derg regime (Rahmato 1982). The Derg nationalised all land, and the administration and the redistribution of the former feudal land was done by the *kebeles* or peasant associations (PAs) (lowest administration unit, sub-unit of a district). The EPRDF adapted but kept the land regulations established under the Derg, but the new regional states also got the right to issue their own land policies (Crewett et al. 2008). However, in all of them land is state property and cannot be sold or exchanged, although there are limited rights for land transfer such as inheritance and renting. But there are also certain conditions on who can be a land holder and how the land should be managed that differ between different regions (Rahmato 2008). Farmers, however, still live in fear of land redistribution, which was common during the imperial regime (*rist* system) and was taken to a new level by the subsequent regimes (Crewett et al. 2008). In 2003 the Ethiopian government started land certification and registration with the aim of increasing tenure security and thus encouraging farmers to invest more in their plots. In spite of this, farmers are still afraid of redistributions; land expropriation for public purposes has continued; and land disputes have increased rather than decreased (Rahmato 2008). The traditional way in which tenure has been framed until now and the relatively new trend of land grabbing stand in stark contrast to the government's official commitment to participation, support of smallholder farmers, protection of environmental resources and biodiversity in the country and a commitment to sustainable development (MoFED 2010). However, this ambiguity is not surprising when looking at other examples of recent political history in Ethiopia. Abbink (2006) assesses what happened in Ethiopia before, during and in the aftermath of the elections in 2005 (see also 1.4.4.1), and describes the disillusionment of the Ethiopian public and donor countries about these events: 'after the regimes of Emperor Haile Sellassie (1930 – 74) and the military leader Mengistu (1974 – 91), centralist authoritarianism is not gone but perhaps is being reinvented in a new form.' (Abbink 2006:174). The rhetoric about bottom-up governance in Ethiopia is situated in a history of top-down leadership. In practice, the changes are small and frequently reversed to the opposite.

Nevertheless, it is difficult to talk about rural development in Ethiopia without mentioning participation. Yet it is important to understand how 'participation' is interpreted in the specific historical and political context of Ethiopia. Participatory approaches were already introduced in Ethiopia by external donors during the Derg Regime (Harrison 2002). Harrison (2002) explains which historical processes were associated with participatory processes in Ethiopia:

> The Ethiopian State is widely seen as hierarchical and controlling. In the past, some commentators have attributed this to the supposed 'psychological characteristics' of the dominant 'Abyssinian' (Amhara/Tigrayan) people. Levine (1965), for example, suggests that deference to hierarchy and equivocation are hallmarks of the 'Abyssinian' culture. (Harrison 2002:598)

She criticises that authors like Levine (1965) and Korten (1972) 'essentialize 'Abyssinian culture' and do not root their analyses in the wider historical and social context shaping the supposed psychological characteristics.' (Harrison 2002:598). Such generalisations essentially claim that 'Abyssinians' (a label applied for Amharan and Tigrayans which Harrison does not agree with) are by nature deferent towards superiors; that superiors and subordinates cannot enter negotiations; and that to acquire an office is not a responsibility but a reward (Korten 1972 in Harrison 2002). However, some of these generalisations are also found in current 'debates about the relationship between the apparently Amharan and Tigrayan-dominated government and the rest of the population.' (Harrison 2002:598). Furthermore, the experiences of coercion and control under both the regime of Haileselassie and the Derg have manifested the perception of the state as holder of 'uncontrollable power' (Harrison 2002:599). Following the transition period after the Derg, the EPRDF has decentralised the governance system, however according to Harrison 'this has been on the basis of top-down socialist principles of state control that remain at odds with more liberal donor agendas' (Harrison 2002:599). The dominance of the state in their lives, and the overall presence of the state explain people's response to participation (Harrison 2002). Authority is not to be challenged; it is used by those in power to impose their will on others (Pausewang 1997 in Harrison 2002). The potential for participation to develop even to a minimum level of shared decision-making rather than information or consultation is therefore not high. Additionally, the understanding of participation includes mass mobilization. Mass mobilization (*tesatfo*) has been used in the context of food aid for soil and water conservation and similar activities: people who had become part of the food aid programs were obliged to work in order to receive aid (Harrison 2002). It is now employed again for similar activities (like building terraces, digging trenches or planting trees) in the context of the Growth and Transformation Plan (GTP) (MoFED 2010). Participation in mass mobilization is not voluntary, but 'this government –induced 'participation' nevertheless has certain characteristics in common with it. The ideal of working for the betterment of 'the community' is one of these. In the government interpretation, this priority takes precedence over individual needs.' (Harrison 2002:600).

Political processes and the use of natural resources in the Ethiopian Highlands have been interlinked for a long time. This interlinking happened, for example, through the destruction of forest resources through war; through the introduction of politically motivated concepts of natural resource management such as forest plantations and permanent soil conservation structures on agricultural land; and by enforcing institutions to carry out natural resource related activities that were used for control and surveillance of farmers in the most remote areas of Ethiopia at the same time (Human Rights Watch 2010). As I explore later, this context and legacy continues to influence project encounters. Yet whatever story is being told about natural resources in the Ethiopian Highlands is difficult to put into context without the background of the country's broader history of politics, war and religion.

1.4.4 Political History and Policy Context

1.4.4.1 Political History

Ethiopia has a long history of changing imperial regimes, dating back to the Axumite period in the first millennium BC (Young 1998). Following a period of unification and modernisation instigated by the Emperor Menelik II (1844–1913), the Italian occupation (1936–1941) and the power struggles during WWII led to an initial setback during the reign of Emperor Haile Selassie (1892–1975), but his international connections and reforms inside the country led Ethiopia back on a path of modernisation in the 1950s and 1960s (Wubneh and Abate 1988; Clapham 2006). General discontent among the growing number of intellectuals and students but especially the fact that he was seen to ignore the development of a serious drought and famine in the north of Ethiopia led to internal discontent with his reign (Wubneh and Abate 1988; Young 1998). In 1974 a Soviet-backed Marxist-Leninist military regime, the 'Derg', led by Mengistu Haile Mariam, established a one-party communist state (Clapham 1992, 2006). This was the starting point of a traumatic period of oppression and terror until the early 1990s that severely affected the economic development of Ethiopia (Abebe and Pausewang 1994).

A tragic series of famines hit Ethiopia in the early 1980s. This national tragedy and the realisation that democratisation and solutions for ethnic tensions in Ethiopia would not be achieved under the Derg were the starting point for the insurrections against the Derg regime (Young 1998). Specifically, in Tigray and Eritrea the Tigrayan Peoples' Liberation Front and in Oromia the Oromo Liberation Front developed into a serious threat to the Derg regime (Young 1998). The fall of the communist regime in the Soviet Union and Eastern Europe also cut off support and aid from these countries (Kinfe 1994), although this played only a minor role

according to Clapham (1992). Eventually the military collapsed and gave in to the guerrilla forces in the north and the massive army of Mengistu fell apart within a matter of days in May 1991, when the joint rebel forces advanced on Addis Ababa (Kinfe 1994). A transitional government was established and Meles Zenawi from Tigray, a rebel fighter, became president from 1991 -1995. It was intended as a unified government, but in June 1992, the Oromo Liberation Front withdrew from the government, and in March 1993, members of the Southern Ethiopia Peoples' Democratic Coalition also left the government (Young 1998). In 1995 the first free and democratic elections took place and Meles Zenawi became prime minister and remained so until his death in 2012. His follower, Hailemariam Dessalegn, is from the south of Ethiopia, but the Ethiopian People's Revolutionary Democratic Front (EPRDF) remains in power (Handino, Lind and Mesfin 2012).

The elections in May 2005 resulted in a dispute over the validity of the outcome that declared Meles Zenawi and the EPRDF the winner, and some opposition groups claimed fraud (Human Rights Watch 2010). Unrest and demonstrations were handled very harshly by the government, with a reported number of about 200 people killed in Addis Ababa (Human Rights Watch 2010; International Crisis Group 2009). Opposition politicians and journalists were arrested but later released (Human Rights Watch 2010; International Crisis Group 2009). These events have created a feeling of uneasiness especially among intellectuals and the middle classes regarding their freedom to express their political views and issues seen as sensitive to general government policies. Memories of the oppressive and traumatic years of the Derg regime are still fresh for the older generations. The elections in May 2010 took place in a climate of control and a mixture of resignation and a wish for peace and stability. The opposition was weak and the EPRDF won a landslide victory.

1.4.4.2 Regional Authorities

Ethiopia is organised in a federal system with nine regional states. The two case studies that I am addressing in this thesis are located in two different regional states: the case study in Galessa is located in Oromia. The regional capital is Addis Ababa, about two hours' drive by car from Galessa. Many farmers in Galessa have relatives working in Addis Ababa. Galessa is connected to an all-weather road leading to Ginchi (about 15 km distance), which is also the *woreda* (=district) in charge of Galessa. The proximity of Addis Ababa has many advantages for Galessa such as market access, a relatively highly frequented road in nearby Ginchi (leading from Addis Ababa to Ambo), and the possibility to visit the regional capital and gain access to information, a large and diverse job market. The research organisations working with the

farmers in Galessa are also partly located in Addis Ababa and partly in Holeta, on the way to Addis Ababa. They are however federal research organisations: the Holeta Agricultural Research Centre (HARC), a subcentre of the Ethiopian Institute for Agricultural Research (EIAR), as well as the Forest Research Centre (FRC) in Addis Ababa, also linked to EIAR (see also 1.4.5). The language in the Regional State of Oromia is primarily Oromiffa, although many people speak Amharic fluently. However, few researchers from the federal research institutes speak Oromiffa. This creates some barriers in communication and translators are sometimes used. During the Derg regime it was forbidden to use Oromiffa, but through decentralisation the regional languages also gained their own status as administrational languages. Therefore many people in rural areas are not happy to use Amharic nowadays which they perceive to be a language of suppression.

The second case study (Ambober) is located in Amhara Region, about 50 km south of Gondar, the zonal capital. The regional capital is Bahir Dar. It can be reached on the connecting road between Gondar and Bahir Dar within three hours. The distance between the two cities is about 180 km. Ambober is located about 10 km away from this road, and the connection is a mud-road. During the rainy season it is most of the time impassable, and throughout the year there is no public transport on this road. Most farmers prefer to walk to Gondar across the mountains on a foot path, transporting goods with donkeys. The administrational unit responsible for Ambober is in Maksegnit Woreda, located on the main road in the direction of Bahir Dar. The location of Ambober and its difficult accessibility are also the reason why research and extension are not so well connected to the place. While Galessa (see above), can easily be reached all year round, Ambober is difficult to travel to. However, in the last few years the Gondar Agricultural Research Centre (GARC), a subcentre of the Amhara Region Agricultural Research institute (ARARI) (see also 1.4.5), has been involved in a number of studies and smaller projects together with the University of Natural Resources and Life Sciences, Vienna, Austria (BOKU). ARARI, as a regional research institute, has a different mandate from the federal research institutes. It has its own subcentres spread across the region, and its own research strategy, while HARC works according to the research strategy of the federal headquarters at EIAR.

The most powerful regional government agency in both regions is the Bureau of Finance and Economic Development (BoFED) because it has the power to decide on budget allocation to the other regional government offices. When it comes to the implementation of government policies on soil conservation, forestry and land degradation, the main actors can be found in

the sub-organisations of the regional Bureau of Agriculture and Rural Development (BoARD)[6] such as the Woreda Bureau of Agriculture and Rural Development (WoARD). Other relevant government organisations related to the BoARD are the Environmental Protection Agency (EPA); the Environmental Protection, Land Administration and Use Authority (EPLAUA); and the recently established Oromia Forest and Wildlife Enterprise (OFWE) and the Amhara Forest Production Enterprise. The fact that forestry itself is subsumed under the BoARD and does not have its own ministry or comparable institutional representation is a source of grief to some foresters who would like to see a more prominent role for forestry in light of the prominent role assigned to deforestation in natural resource degradation discourses. Wubalem (2012:38) calls this the 'institutional instability of the forestry sector' and as a result sees poor coordination, monitoring and evaluation in forest development; poor linkages between education, research, extension and policy making; low resource allocation; and poor coordination between other sectors as well as weak policy implementation.

As Oromia Region has the largest share of remnant forests in Ethiopia (63% of the total forest area of the country according to Wubalem 2012), the discourse around forestry is different from the one in Amhara Region (only 2% of the total forest area of the country according to Wubalem 2012). The OFWE is involved in the development of participatory forest management schemes in the region, together with NGOs such as FARM Africa. FARM Africa has the longest experience with participatory forest management in Ethiopia, and one of their first projects was in Chilimo Forest, not far from Galessa. While in Oromia officials still see a potential for forest exploitation and development of sustainable forest management of existing forest areas while considering reforestation and exclosures, the discourse in Amhara Region centres much more on reforestation and the establishment of exclosures only. While reforestation often leads to eucalyptus plantations, exclosures in many cases enable the gradual development of a mixed forest type hosting also indigenous species side by side with eucalyptus.

1.4.4.3 Agricultural and Environmental Policies

In theory, government policies aim at empowering farmers in the research process by introducing a more participatory approach to research, starting from research design through to implementation: 'Satisfying key stakeholders is of utmost importance to the success of a

[6] Specifically they are called 'Amhara National Regional State Bureau of Agriculture' and 'Oromia Bureau of Agriculture and Rural Development'.

research organisation and its ability to generate financial and political support' (EARO 2000: 62). Specifically in research planning the national agricultural research centres have to follow procedures to involve key stakeholders and are called upon to apply

> demand-driven, client-oriented, participatory, multi-disciplinary, gender sensitive and farming systems / agro-ecology based research to generate knowledge and appropriate technologies for the development, sustainable utilisation and conservation of tree/shrub, forest and woodland resources of the country, thereby enhancing agricultural production and productivity as well as wood, food and feed security through reduced land degradation and increased soil fertility. (EIAR 2000: 64)

For this purpose, the Research, Extension and Farmers Advisory Council (an institution that underwent frequent acronym changes over the last few years), also referred to as REFAC, has been introduced. But the consultation of farmers within the REFAC is often done by technical assistants applying household questionnaires, and by inviting a few representatives to the actual meetings or platforms. This problem is also recognised in a strategic document of the ADC when referring to policies in Ethiopia:

> The implementation of such strategies and programmes is characterised by significant gaps between policy and the limited participation of those working on the land. A typical example is EFAP. The preparation of this programme has consumed a lot of time and resources, but implementation has yet to gain any momentum. (ADC 2007: 10)

Many policies and strategies were developed during the time after the Derg by the Transitional Government (1991–1995) 'to set a new direction for the economic reconstruction and social rehabilitation of the warn-torn [*sic*] and poverty-ridden country' (Assefa 2008: xiii). Bekele (2008:337-338) points out the connection between historical political developments and environmental issues in Ethiopia:

> Natural resource and environmental protection policies often reflect ideological preferences of those in power and are not allowed to mature in a continuous manner, being amended only when essential, as it ought to be under normal circumstances. Each turn in natural resource policy and law in this country, therefore, needs to be understood in the context of the ideological stance of the time.

Bekele (2008) presents several historical examples of this, and some of them had profound consequences on the state of the environment in Ethiopia:

> …the 1980 forestry proclamation fixed the forest property regimes at two: State and *Kebelle* forests. Following these proclamations, foresters took their occupational and expertise enthusiasm to the extreme and assumed the power to define what should constitute forestry and which land should come under trees. Thousands of ha of land belonging to communities and individual households came under plantation by force. However, most of the conservation and development activities in soil and water

> conservation, wildlife and forestry ended in destruction as seen during the 1991 change of government. (Bekele 2008:340)

An important policy document originating in the Derg is the Ethiopian Forest Action Program (EFAP) (MNRD&EP 1994). The original idea was formulated by the Derg in 1984 as the ten-year national perspective development plan that had a programme on conservation and development of forest, wildlife, soil and water resources (Bekele 2008). This program aimed at an increase of forest cover of 24% over 10 years' time (Bekele 2008). However, the preparation of the actual document already took until 1994:

> …the implementation of that national program was constrained by shortage of resources. Consequently, the Derg government requested FAO […] to prepare EFAP, with the hope of securing donor support for its implantation. Following a preliminary document prepared by FAO in 1988, work on EFAP project document was initiated in 1990 and completed in 1994 through a collaborative work by the government of Ethiopia, FAO, UNDP and the World Bank. (Bekele 2008:341)

In this process the forestry sector in Ethiopia and major sectoral issues as well priority areas were defined by national task forces and working groups; action programs were proposed by international consultants; the report was reviewed and adopted by a national committee and the World Bank; and finally a donors' conference was convened to get support for the implementation (Bekele 2008). It was now clear that the issue of forest management in Ethiopia was no longer a national issue only, but it had been made an issue of international concern by the conscious involvement of international actors. The involvement of these international actors linked national policies to international interests and agreements. It was built on assumptions that do not hold true at a closer look:

> EFAP was an ambitious plan in view of the human, financial, and institutional capacities that were required to implement its proposed projects. It was also ambitious in view of some critical policies and legislations that had to be issued and some existing ones that had to be implemented. […] Information used to develop the EFAP was not sourced out of currently research data and was largely outdated (rate of deforestation, forest area estimate and annual volume increment and utilization etc.); […] the program did not have appropriate provisions under the new decentralized federal structure (Bekele 2008:344)

EFAP aims at increasing forest products, agricultural production (by the presumed positive effects of increase in forest cover on agriculture), at conserving forest ecosystems and biodiversity, and at improving livelihoods of rural communities (Bekele 2008). However, the action programmes developed to achieve these aims resonate principles of forestry that seem difficult to apply in Ethiopia under the current circumstances: the success of increasing tree productivity, ecosystem management to protect remaining forest areas, forest industry development, and wood energy development (Bekele 2008) is linked to critical structural

issues such as land tenure and infrastructure. Even though EFAP addresses inter-sectoral linkages to other sectors (Bekele 2008), the implementation seems difficult without creating an enabling environment for forest protection and growth as well as industry and wood energy development. According to Bekele (2008), the strength of EFAP is its novelty in addressing the current situation in forestry in Ethiopia and

> the future trends, and the development needs of forestry and related sectors of the country. This is the first document to review the limitations of the forestry undertakings during the Military government, particularly the non-participatory approach of forestry activities. […] In view of previous traditions wherein policies and programs are often produced by a small circle of authorities, the EFAP process can be considered as fairly participatory in terms of involving a multidisciplinary team of experts. The process involved a series of workshops that offered the opportunity for several hundred Ethiopians to express their views on the draft document. (Bekele 2008:343).

However, there remain millions and millions of Ethiopians unasked about the future of such a vital resource for their lives as trees and forests. It is thus questionable if the term 'participatory' is adequately used in this context.

The implementation of EFAP had its own challenges: like many other policies EFAP emerged from a period of transition. Thus the institution, namely the Ministry of Natural Resources Development and Environmental Protection, assigned as responsible for implementation no longer existed after restructuring the government shortly after the publication of EFAP (Bekele 2008). The second challenge came after the introduction of federalism – EFAP was designed for country-wide implementation, and then had to be turned into regional programmes for each region separately which was not followed up with adequate implementation by all regions (Bekele 2008).

Bekele (2008) analyses Ethiopia's environmental policies in a comprehensive manner. Apart from EFAP, he also discusses the Forest Conservation and Utilization Policy (2007), Conservation Strategy (1997), Environmental Policy (1997), Wildlife Policy (2007), the Water Policy (1994), Rural Land Administration and Land Use Policy (2004), Environmental Impact Assessment Proclamation (299/2002), and the Plans for Accelerated and Sustainable Development to End Poverty (PASDEP). He points out the major challenges in policy making in Ethiopia:

> In a relatively short period of time during the last century, Ethiopia passed through contrasting socio-economic and political settings. Each new system works to negate the preceding one, making policies and laws, in some cases, in sharp contrast with the old ones.

> […] the important experiences gained from the past were lost in the ideological struggle or elation of political or military victory. […] it also requires a costly rebuilding of institutions and implementation work. (Bekele 2008: 361-362)

There are large numbers of policy documents and proclamations available, both on a national and regional level. The challenge however is that often the data base they are built on is not reliable; the natural resources to be managed are often an issue of conflict between the people and the state; policies often emerge from political upheavals; participation in practice is rather limited; important but powerless stakeholders were not part of the formulation process of the policies; many policies were developed on federal level, but implementation should be regional which created an institutional vacuum; policies directed towards conservation received less emphasis than those aiming at increase in productivity; the role of women is mentioned in the policy documents but there is no implementation foreseen for the principles mentioned (Bekele 2008). Policies thus exist in abundance, but implementation does not work: this is partly due to lack of capacities, partly due lack of political will and weak organisations in charge; another shortcoming are the lack evaluation and monitoring as well the missing process of turning policies into laws and regulations (Bekele 2008). Frequent changes in the ministerial institutions in charge, most of all the Ministry of Agriculture, as well as high fluctuation in staff members contribute to aggravate the problem.

Rahmato (2008b:30) identifies several critical issues in relation to agricultural policies in Ethiopia. One is the difference in ecological categories employed by farmers (Daga, Wayna Daga and Qolla, see footnote 4 in 1.4.3.2) that is based on altitude and precipitation, and the government's system - at the time when many policies had their origin - defining fifteen agro-ecological regions and 140 agro-ecological zones (MoA/FAO 1984 in Rahmato 2008b). As a second major issue the author mentions the fact that the first census in Ethiopia (1984) indicated that the population of Ethiopia was 88% rural, and 77% living in the Daga and Wayna Daga areas, above 1800 m. With these parameters in mind the main policy on rural development was issued in the mid-1990ies and then refined in 2001 (Rahmato 2008b). The document published in 2001 (FDRE 2001 in Rahmato 2008b) remained relevant for more than ten years, and the main message sounds similar to the core messages of more recent policies such as the Growth and Transformation Plan (GTP) issued in 2010 (MoFED 2010):

> the country's overall development was to be agriculture and rural centred while the basis for the rural sector was to be agricultural-led development.[…] the country's chief and abundant resources are land and labor and […] the great majority of the people live in rural areas and are agriculturalist […] the predominant focus is on smallholder farms with greater weight given to crop production than other aspects of the peasant economy. […] The

> strategy was to provide peasant farmers with new technologies and improved farming practices to enable them to increase productivity and boost output. […] The dissemination of new technologies was envisaged primarily in the form of what may be called "soft" technologies, i.e., agro-chemicals, improved seeds, good management and utilization of water resources, and more efficient farming practices. (Rahmato 2008b: 131)

The policy states that Ethiopia is a populous country, and the majority of the people work in agriculture in the Highlands – therefore the path towards development should be through agricultural development primarily. This idea was also central to the Agricultural Development Led Industrialization (ADLI), an approach to overall development adopted by the Ethiopian government in 1999 in response to food insecurity challenges. ADLI follows 'the agriculture growth approach to modernization that was the dominant model of development adopted by the major donors in the 1960s.' (Rahmato 2008b:138). However, unlike this older model ADLI allocates a strong role to the smallholder farmers and does not foresee investment in industrial and other sectors (Rahmato 2008b). Rahmato (2008b) points out several issues in relation to ADLI that make its successful implementation difficult: firstly, the structure of landholdings, with only 13% having more than two hectares of land. Secondly, he mentions that the increased use of fertiliser has not resulted in an overall productivity increase (World Bank 2007a in Rahmato 2008b). Thirdly, he anticipates that the growing population will further increase the fragmentation of farm plots and the pressure on environmental resources (Rahmato 2008 b). Nevertheless, similar ideas as in the original ADLI can be found in the more recent GTP. Like its predecessor, the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) (MoFED 2006), the GTP follows the paradigm of the 'developmental state' and focuses to a large extent on growth. Agriculture continues to play a central role, specifically small-scale agriculture where the government hopes to make use of successful 'model farmers' to demonstrate how to increase productivity following a Green Revolution approach to agricultural intensification:

> A number of model farmers who registered the highest productivity and production, particularly in agricultural sector have been emerged. Best practices of these model farmers for increased productivity and production have been drawn for scaling up to the rest of the farmers in the upcoming five year Growth and Transformation Plan so as to increase productivity and production of most of farmers nearer to the model farmers. (MoFED 2010: 5)

The GTP expects smallholder agriculture to be a source of growth, and large-scale commercial farmers are expected to support the private sector. Commercial farms will be given to investors. This shift from focusing on smallholder farmers to only supporting investors had already begun in the early 2000s (Rahmato 2011).

Growth is the overriding paradigm in the GTP. Yet, by capacity building and improved extension this policy is still oriented towards supporting smallholder farmers:

> Close support will be rendered to encourage farmers for continuous technology use and increasing agricultural production in an organized system. Complimenting these two, the setting of systems and strengthening of the same to ensure the rapid transfer of practically tested technologies, continuously testing new technologies and supplying them to farmers, will also be an important direction [*sic*]. (MoFED 2010: 18–19)

Powerful political frameworks such as the MDGs, the GTP and policies related to climate change impact on research on different levels. Funding mechanisms such as contractual research often provide the topic and predetermine the outcome of research. A strong political push towards approaches such as IWM and more participatory approaches forces researchers to adopt certain methods, but sometimes without much theoretical back-up. These are requirements laid down by donors in budget negotiations for aid, either as budget support or tied to funding for certain programmes or projects. Most donors still have their own priority package in spite of international agreements on donor coordination and coherence – bilateral aid reflects the priorities of donor governments, funds given by foundations reflect the ideological stance of the foundation. These requirements can then often be found again in Ethiopian policies, especially when they were already developed jointly with potential donors, e.g. EFAP. But rarely are the underlying motivations of donors critically evaluated in Ethiopia unless they question issues of governance.

1.4.5 Agricultural Research System

The development of an agricultural research system is fairly recent in Ethiopia. Historically, agricultural research started in 1947 with the founding of the Agricultural Colleges of Ambo and Jimma (Bechere 2006). Regarding the agricultural research institutes, history goes back to 1966 when the Institute of Agricultural Research was founded (Abate, Deressa and Molla 2004). Several research centres were founded in the 1970s, among them also the Forestry Research Centre (Bechere 2006). The 1990s were the formative years for the Ethiopian Agricultural Research System. At that time, the Federal and the Regional Agricultural Research Centres (RARCs) were divided: the RARCs were decentralised and are independently run by the Regional Bureaus of Agriculture (Bechere 2006). In 1997, the Ethiopian Institute of Agricultural Research (EIAR, until 2005 Ethiopian Agricultural Research Organization, EARO) emerged from a merger of IAR with several other research centres. This decentralisation and reorganisation phase lead to reduced staff capacity and expenditures, and by 2008 EIAR's share of staff

capacity had fallen from 80% in 1997 to 42% in 2008. The RARC resp. Regional Agricultural Research Institutes (RARIs) on the other hand grew, and their FTE staff numbers increased from 178 in 1997 to 613 in 2008. (Flaherty, Kelemework and Kelemu 2010)

The flagship organisation and main actor on a federal level is EIAR which leads a frequently changing number of centres and subcentres, including the Holeta Agricultural Research Centre (HARC) (Flaherty et al. 2010). Figure 1.5 shows the current hierarchical structure of the Ethiopian National Agricultural Research System. EIAR reports to the Ministry of Agriculture and Rural Development (MoARD), but it does not have any affiliation with the Ministry of Science and Technology. (Flaherty et al. 2010)

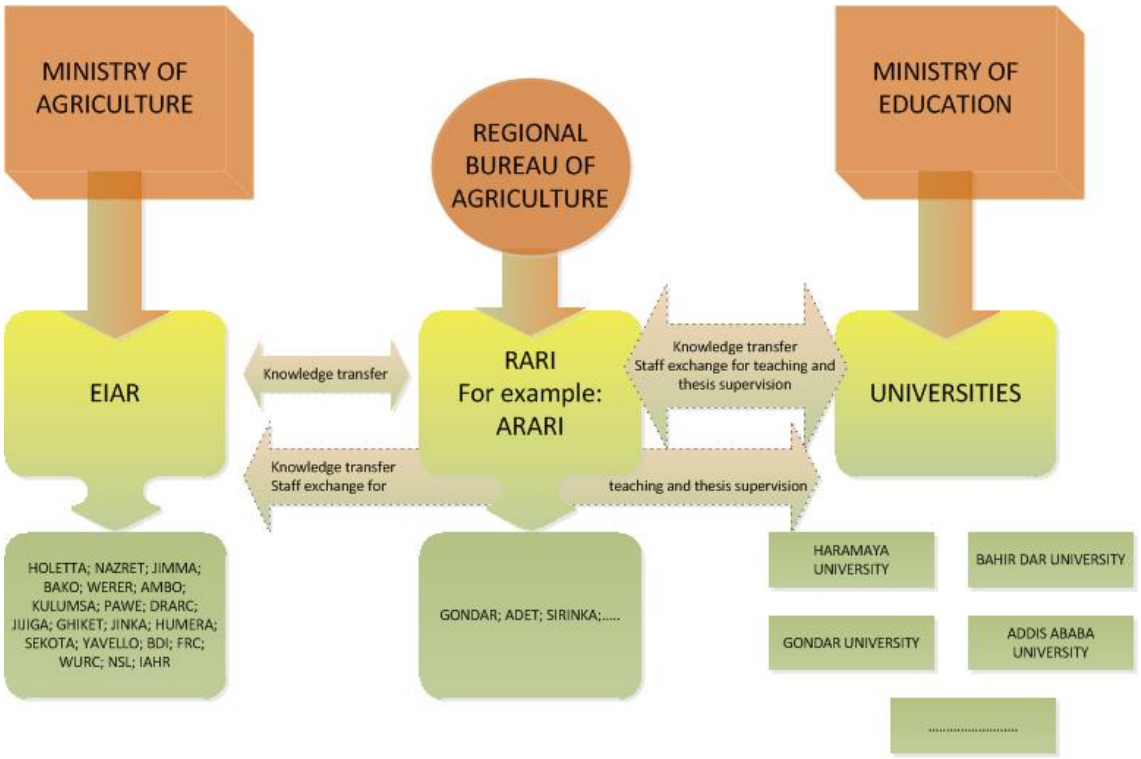

Figure 1.5: Ethiopian National Agricultural Research System (adapted from Bechere 2006).

While EIAR and the universities are under the respective federal ministries, the RARIs have their own regional authorities to report to. This leads sometimes to tensions, especially between the universities and the RARIs. Recently a high number of the newer universities have opened agricultural faculties - and have started to recruit staff members amongst others from the RARIs.

Funding for research activities is low in the research institutes, and it mostly depends on the initiatives of the individual researchers to acquire external, mostly foreign, funds to actively engage in research. A lot of funding also comes from collaborative projects with centres of CGIAR (formerly the Consultative Group on International Agricultural Research) (Flaherty et al. 2010). Apart from that, researchers rely on project funding emerging from their personal networks. Acquiring such funds and implementing such projects can consume a considerable amount of time and effort. During informal encounters scientists often complained that they felt trapped between the political system, their interests in their research and their personal careers as well as the need to acquire an adequate income. At the time of my research the salary of a PhD holder was about 4000 ETB per month, which then converted to about 180 Euro.

I learned a lot about the agricultural research system during interviews, Focus Group Discussions (FGDs) and informal conversations with scientists from forestry, agriculture as well as some social scientists in the context of the case studies (see 2.2 and chapter 3). I heard repeatedly that in recent years a number of changes in the governance system as well as political changes had induced a lot of staff turnover in the research organisations. One of those major processes had been the Business Process Restructuring (BPR) that radically changed the entire internal organisation of most government organisations. This system broke up all organisations into business processes to facilitate a less bureaucratic administration. In practice this top-down ordered restructuring process led to a complicated, artificial system of so called ‘processes’ and has paralysed the research system for some time. It also led to high staff turnover in the institutions, where some people were forced to leave, others retired early and others left by their own choice.

Some of the scientists I have spoken to shared their impressions regarding the relation of politics and research with me informally: according to them this relation had intensified in the last years. The last two elections and their aftermath had left their imprint on the research sector. According to them it had become increasingly more politicised, driving staff members to the NGO sector or abroad. This politicisation had not only led to a mix up of politics and research with many of the leading positions in the research institutes assigned to people with political functions, it had also demotivated staff members who had been interested in research rather than politics and had found themselves sitting in meeting after meeting instead of working on their actual research topics.

This high staff turnover has affected the age structure in the research system. Already since the fall of the Derg positions in government related organisations mostly fell to junior employees. During the Derg many scientists left the country. After the fall of the Derg people known to be close to the Derg were replaced with junior staff members – Harrison (2002) also reports this for government representatives in other areas. Flaherty et al. (2010) confirm that most senior staff members have either left, retired or are in hierarchically very high positions. The majority of the research staff are junior staff (Flaherty et al. 2010).

Among junior researchers staff turnover is high, with people coming and going doing their BScs, MScs and finally PhDs, as I experienced myself during the last years. However, while the number of staff members with higher university degrees is increasing slowly, the level of actual research experience reportedly is decreasing. Many researchers complained during the interviews and personal encounters that they had very little time to do actual research, and that the bureaucracy was overwhelming.

The two research organisations my case studies were associated with were the Holeta Agricultural Research Centre (HARC) and the Amhara Region Agricultural Research Institute (ARARI). HARC is the oldest agricultural research centre in Ethiopia. It was founded in 1977. It is located in Oromia Region, 36 km away from Addis Ababa, and belongs to EIAR. It is thus a federal research organisation. In research it is organised in four work processes: livestock, crop, socio economics and forestry. In the forestry process there is on PhD holder, two MSc, two diploma holders and two staff members with certificate level. The work process has two case teams, the plantation and agroforestry team, and the non-timber forest product team. They have a tree nursery for experimentation. (HARC 2014)

The Amhara Region Agricultural Research Institute (ARARI) was founded in 2000 as a result of the decentralisation policy of the Ethiopian government. It is located in Bahir Dar, the capital city of Amhara Region. ARARI is organised in nine different regional subcentres, and it has six research directorates for crop, livestock, soil and water, forestry and agroforestry, agricultural mechanization and food science and agricultural economics. The forestry and agroforestry directorate carries out research activities and projects at five centres in Amhara Region. There are also forestry teams at the different subcentres, for example at the Gondar Agricultural Research Centre (GARC). (ARARI 2014)

Some of those subcentres existed already before ARARI itself was founded, others are new. GARC was established in 2003 and suffers from lack of infrastructure, office facilities are very poor, and there is a constant struggle for field cars. As it is located in Gondar city, it also does not have any adjacent research facilities for field trials.

Both HARC and ARARI are organised according to agricultural commodities, and focus primarily on bio-physical sciences. The structure represents 'social research' as socio-economic research only. Some scientists told me that the structure of the research system was in contrast to the situations they were confronted with in the field. The understanding for the importance of social issues was often expressed verbally, but the need to involve social scientists was not always understood to be important. In a discussion about the importance of social research it was pointed by one agronomist that '*social research will come automatically when we do our research as natural scientists*' (E-scientist, 15.2. 2011, workshop, Gondar). One other concern that some natural scientists at ARARI and HARC expressed regarding social research was that they could not take it seriously when it was qualitative. If research outputs were not presented in numbers, graphs and tables, '*it will not be taken serious by the government*' (E-scientist, interview, 1.3.2011). Frequently during discussions when I asked scientists to voice their opinion on a certain issue, they were reluctant to make a statement. Many started by saying that this issue required to be studied first with empirical research, and without such data it would be difficult to say something about this issue. I experienced similar situations during conferences and workshops that I attended in Ethiopia. For example during the national conference on soil and water conservation in Addis Ababa, several consecutive presenters did not present their analysis and interpretation of their findings, but the pointed to one table after the other and read out numbers, rather than interpreting them for the audience. Repeatedly they would say '*These are the data, here you can see the data*.' (2nd National Conference on Soil and Water Conservation, Addis Abeba, 27.2.2011). They hesitated to express their conclusions in front of the others. And the responses of the audience were extremely harsh and very destructive in content which was not unusual as other Ethiopian colleagues confirmed afterwards. This culture of discourse is understandable in light of the historical background discussed in 1.4.3.4 – top-down hierarchies and authoritarian discourses that are common in interaction with farmers are also common among scientists themselves.

1.5 THESIS STRUCTURE

It is in this personal, country and policy context that I embarked on this thesis, and in which it unfolds. Chapter 2 elaborates on the conceptual framework and methodological approach

used in the thesis. The conceptual framework is based on three groups of theoretical approaches: (1) social worlds, actors and knowledges; (2) epistemologies and ways of knowing; and (3) social studies of science and development studies.

The second part of Chapter 2 explains the methodological approach used. It first introduces the case studies and explains the research design and the selection of methods. It then elaborates on the research process and provides a critical reflection on the use of methods in my research. Finally, it also outlines ethical issues and looks at the positionality of the researcher in the research process.

Chapter 3 introduces the case studies that are the main empirical basis of this thesis. It explains the approaches used in the case studies, that is, Integrated Watershed Management in Galessa and Exclosure Management in Ambober. The chapter highlights the origins of and debates about these approaches, their background and objectives, and how they existed as project scripts and narratives. It then explains how those approaches were applied in the two case studies, and how scientists were struggling to find solutions for the problems they identified, partly with community participation, partly in hours spent at their office desks or in meetings. In this chapter I also look at how the actors in the case studies tried to find an entry point into the community, and how they attempted to enrol farmers according to their needs and objectives. This chapter is mainly about the perspective of the scientists working for the case studies.

Chapter 4 explores how farmers' different ways of knowing have been expressed in the case studies. I present examples regarding sense perception and observation; spirituality; emotion and memories; and I explore how language, authority and exclusion work to prioritise the ways of knowing of some people over others'. In a comparative section at the end, I describe differences and similarities in ways of knowing between scientists and farmers in the case studies, and how their social worlds and their positionalities influence their ways of knowing. In this chapter I also look at influences on decisions about the validity of different ways of knowing, and how these are related to issues of adoption and non-adoption of interventions, technologies and practices in the case studies.

Chapter 5 extends the discussion of ways of knowing to explore the relevance of places, relations and modes of representation as articulations of power relations in the projects. In this chapter I look at how power relations and forms of communication between farmers and

scientists change in different contexts and places. Specifically I bring examples from one case study about a project workshop, a field day and a community nursery to illustrate how power relations and communication changed from one place to another. Finally, I describe more in detail how the scientists eventually 'packaged' their ideas and findings to convince and inform farmers, donors and policy-makers at the workshop. This helps to understand the role of rituals, symbols, languages and different places in the communication of farmers and scientists in the case study.

Chapter 6 provides the conclusion. It also contains a synthesis of this thesis that is structured in four main sections: (1) scripts and narratives, there I synthesise the role of the projects' scripts and narratives; (2) enrolment and participation where I elaborate on the role of users in the project and how participation was interpreted in different ways; (3) power, knowledges and exclusion where I will explain how different representations of knowing, knowledge and epistemologies are competing, complementing and/or contradicting each other, and how those in power also hold the power to determine which and whose knowledge and ways of knowing matter; (4) research governance and farmers' realities, where I point out how the way science and research are enacted often contradicts farmers' realities.

The conclusion then sums up my main arguments. Ultimately, the findings of my research lead me to argue for a more differentiated, novel and innovative way of doing science and research with farmers that moves beyond conventional framings and standardised packages. They also suggest the need for a more reflective approach, engaging on a more eye-to-eye level with different stakeholders.

2 CONCEPTUAL FRAMEWORK AND METHODOLOGICAL APPROACH

2.1 CONCEPTUAL FRAMEWORK

My research combines approaches from Development Studies (DS) and Science and Technology Studies (STS). It seeks to understand what happens when scientists and farmers meet in research projects regarding tree and soil management in a development context. Therefore actor-oriented approaches (Long 2001) as well as theories on narratives and framing in natural resource management (Fairhead and Leach 1996; Hoben 1996; Leach and Mearns 1996; Leach et al. 2007) are taken as a lens through which to understand the role of power and environmental governance (Keeley and Scoones 2003; Agrawal 2005) in these encounters, and the roles of representations of land use, landscapes and more specifically trees and soils (Fairhead and Leach 1996; Leach and Mearns 1996; Rival 1998).

The role of epistemologies and ways of knowing of farmers and scientists in research projects can be better understood when looking at the concept of social worlds (Strauss 1978). People's positions as 'experts' or 'lay people' may shift and transform during their engagement and thus influence the dialogue between them (Tutton, Kerr and Cunningham-Burley 2005). The 'social worlds' framework provides a focus on 'meaning-making amongst groups of actors' (Clarke 2005: 113). The respective social worlds of different actors may in some cases overlap, in others remain separate. Aspects of history, culture and politics may be conjoining factors, but they may also be divisive. These separations become obvious when looking in more detail at interfaces (Long 2001), enrolment and participation (Cornwall 2008; Felt and Fochler 2010) and the role of place (Gieryn 2000) in such encounters.

2.1.1 SOCIAL WORLDS, ACTORS AND KNOWLEDGES

Social worlds are widely used in Science and Technology Studies (STS) literature. The original concept is attributed to Strauss (1978), although it was Cressey (1932 cited in Unruh 1980) who first started using the term 'social world'. He was referring to 'a form of social organization which could, conceivably, create a common "world view" and encompass the entire life-round of social actors' (Unruh 1980: 274). Shibutani took the concept further and referred 'to "universes of discourse" as the determinants of social world boundaries' (Shibutani 1955 cited in Unruh 1980). Strauss explains that social worlds are reference groups, characterised by communicative and collective identities. Thus they 'provide a means for

better understanding the processes of social change' (Strauss 1978: 120). Social worlds influence actors in their choice of research priorities and in their reactions to it. The debates, negotiations and battles within social worlds or between subworlds are called 'arenas' by Strauss (1978: 124): 'Wherever there is intersecting of worlds and subworlds, we can expect arenas to form along with their associated political processes.'

In social sciences, social worlds are used as a general reference to the specific social and environmental context people are embedded in. The concept also refers to the ways that particular social groups – such as scientists and farmers – are also classified as such by society. Even though no one is just a scientist or only a farmer, they are seen as belonging to different social worlds. All of us play different roles in our lives and we are influenced by the different spheres in our lives that together make up who we are. Yet there is an optimistic belief that by declaring our 'membership' of a specific social world, we are able to leave behind the framings, presumptions and symbolism of another. For example, scientists tend to believe that they are approaching their work without bias, as they are working with 'facts', which constitute an important boundary symbol (Gieryn 1995). Strauss does not accept a limitation to discourses and communication; he recommends studying 'activities, memberships, sites, technologies and organizations typical of particular social worlds' (Strauss 1978: 121). He further points out the differences between them, as they may be local or international, small or big, well organised or less so, with tight boundaries or more permeable, hierarchical or not.

Social worlds can also be segmented into subworlds, and social (sub)worlds can intersect (Strauss 1978): artefacts are borrowed or transferred between them, alliances can be formed. These intersections become of particular relevance when understanding processes, strategies and consequences associated with them (Strauss 1978). Social worlds are fluid entities where 'fragmentation, splintering, and disappearance are the mirror images of appearance, emergence, and coalescence' (Strauss 1978: 123).

The formation and change within social worlds is related to power as will be shown in Chapter 4. Even though a degree of uniformity may be assumed when looking at social worlds from the outside, this view may not be shared by all those 'within'. Therefore, some may consider themselves as more authentic representatives of a particular social world in relation to its activities than others (Strauss 1978). An application of these thoughts is reflected in agricultural and forestry scientists' acting and thinking in their interaction with farmers, as will be shown in Chapter 5. When research ideas, concepts, methods and findings are brought to

farmers this is often done through ‘standardized packages’ (Fujimura 1992). This dynamic interface is one of the interfaces where farmers and scientists meet – but, as Chapter 5 shows, it remains constructed by the scientists and emerges as a product of their social and professional reality. This is elaborately explained by Callon (1986) in his famous example of the fishermen, the scallops and the scientists: the scientists want to find out how the reproduction system of economically important scallops in France works, but the scallops are not ‘cooperative’ and the mystery cannot be resolved. The fishermen who have the greatest interest in the answer to this question play only a marginal role in the work of the scientists. But the scientists nevertheless represent both scallops and fishermen when reporting about their experiments. And the scientists are making themselves indispensable, irreplaceable in their roles: ‘They [three researchers] determined a set of actors and defined their identities in such a way as to establish themselves as an obligatory passage point in the network of relationships they were building’ (Callon 1986: 204).

As Chapter 5 shows, scientists often see themselves as the voice of the farmers, the trees and the soil and their self-appointed representatives. Moreover, as soon as scientists start explaining on behalf of the farmers, they also translate, and

> To translate is to displace: [...] to translate is also to express in one’s own language what others say and want, why they in the way they do and how they associate with each other: it is to establish oneself as a spokesmen. At the end of the process, if it is successful, only voices speaking in unison will be heard. (Callon 1986: 223)

Sometimes certain rites and attributes may be required to be considered an authentic member of a social world. Demarcating the boundaries of social worlds (Gieryn 1995), or the symbolic margins (Strauss 1978), one can find certain artefacts and symbols – though those boundaries may be controversial and not subject to consensus. Boundary objects become powerful and significant obstacles, but also symbols of community.

Gieryn (1995) claims that by constructing a social world one automatically establishes boundaries, to find a common ground among those actors who are part of this social world, and to obtain some sort of social legitimation for its existence:

> A ‘social world’ is a group with shared commitments to the pursuit of a common task, who develop ideologies to define their work and who accumulate diverse resources needed to get the job done. […] science itself may be a social world, made up of many social worlds, or part of a more encompassing social world. (Gieryn 1995: 412)

Farmers live and work in their 'laboratory', where they research and experiment as part of their work and their social world, for example, in altering soil conservation technologies, in trying new seed varieties, or in growing different tree species in private homestead nurseries. Scientists have to cope with multiple social worlds; their 'laboratory' has been created by a conscious separation of their own social world (Knorr-Cetina 1981). These differences are articulated in the use of different language, metaphors and symbols (Rival 1998; Haraway 1988). In using selected terms and metaphors realities and 'facts' are constructed, narratives are supported and reified, presuming a certainty about concepts that in reality does not exist (Gieryn 1995). However, space and place are also part of boundary establishment: space is the result of social relations (Gieryn 2000; Harvey 2005), and space also has agency with an effect on social life (Werlen 1993): the dynamic nature of space and its impact on social life have a profound impact on the relation people have with places (Chapter 5).

The meeting of different epistemologies and social worlds implicates different aspects of authority and power. This is of particular interest to understand how decisions are made and conclusions reached (Long and Long 1992). Thus, in Chapter 4 I will look at existing hierarchies that predominantly conceptualise scientific knowledge as 'superior' to the local or traditional knowledges of 'ordinary' farmers or citizens. The latter knowledges are widely framed as a particularly underutilised resource (Brokensha, Warren and Werner 1980) or as indigenous knowledge, which implies knowledge that is culturally specific (Sillitoe 1998). However, I agree with Long (2001) that knowledge evolves dynamically in social processes between different social actors. The perspectives of actors as citizens and the articulation of their epistemologies as socially constructed processes have been addressed in various ways by Long and Long (1992), Long (2001), Jasanoff (2005), Leach et al. (2005) and others. Epistemologies and narratives are being constructed by the social realities of human beings that extend beyond their 'professional identities' as scientists or farmers. Moreover, these epistemologies and narratives are also embedded in the social worlds and perspectives of farmers and scientists (Gieryn 1995; Rival 1998; Strauss 1978), as well as in what is termed techno-political cultures by Felt, Fochler and Winkler (2009). Aspects of history, culture and politics may be conjoining factors, but they may also be divisive if not shared by different actors. Hence, the way those actors position themselves in relation towards technologies often reflects their historical, cultural and political contexts (Felt et al. 2009). On the other hand, practitioners such as

extensionists[7] and farmers also find it difficult to see the value of scientific knowledges and how these are connected to their own social worlds and ways of knowing.

Different ways of knowing exist among different actors, and those actors may even have different ways of knowing within themselves according to their social worlds; for example, a farmer can be a scientist, an extensionist may be a farmer, and a scientist may also be a donor. And men and women, old and young, rich and poor, may have similar, but also very different ways of knowing – gendered views in research (and development) projects often adhere to common stereotypes such as women being users, men being decision-makers (Harrison and Watson 2012) and 'women cook, men innovate' (Crewe and Harrison 2000:106). Other stereotypes may depict farmers as poor, ignorant and in need of help, and they may portray for example scientists as having knowledge to teach others; men being good at natural sciences and women being better at social sciences; and 'indigenous' technologies may be ridiculed as outdated and useless by some, and they may be idealised and taken out of context by others:

> […] in practice 'real' technology tends to be defined rather narrowly as hardware produced in 'modern' environments. On the other hand, there is an increasing movement within development agencies that eulogizes indigenous knowledge. The division between indigenous and Western or scientific knowledge is, however, based on ideas about people rather than on objective differences in knowledge or expertise. (Crewe and Harrison 2000:92)

These perceptions and stereotypes influence the nature of interfaces (Arcre and Long 2001) where powerful actors shape the way alliances, coalitions and networks transform ways of knowing - and power may also be exercised through different ways of knowing (Foucault 1980).

2.1.2 EPISTEMOLOGIES AND WAYS OF KNOWING

Epistemology is the theory of knowledge, and it tries to answer what knowledge is, what is the nature of knowledge, and w43 - hat it means to know something (Truncellito 2007). A second important aspect of epistemologies is that they help to understand what knowledge human beings can acquire and how they can do so (Truncellito 2007). This second aspect of epistemologies is how I understand 'ways of knowing' in this thesis. It is concerned with the issue of how to obtain or seek knowledge. Williams (2001) discusses at length the problems of

[7] Extensionists are the extension experts of the District (= Woreda) Agriculture and Rural Development Office as well as the development agents assigned to the rural areas by the same office.

understanding knowledge in his book about epistemology. According to him the range of different philosophical theories addressing knowledge[8] cannot provide clear answers and are not only contradicting each other, some are even contradictive within themselves. For Williams, contextualism implies that knowing (or knowledge as such) changes according to the context where it is expressed.

Williams (2001) distinguishes three sub-problems to the issue of gaining knowledge: the first one is the problem of unity. He asks if there is one or if there are more ways of acquiring knowledge, and whether this depends on the kind of knowledge one wants to acquire, e.g. in natural or social sciences. The second problem is ameliorative and Williams asks if our ways of seeking knowledge can be improved. The final one is the problem of reason or rationality. Here he says that the concern 'is whether there are methods of inquiry, or of fixing belief, that are distinctly rational and, if so, what are they?' (Williams 2001:2). In this study, I look at issues related to unity and improvement – which different ways of acquiring knowledge exist, and how can these ways of seeking knowledge be improved or supported. In order to find answers to these questions I apply several key concepts: scripts and narratives that are often employed in standardized packages; sense perception, emotion, spirituality, language, exclusion and authority; and finally place.

I derive the concept of scripts from the work of Madeleine Akrich, an adherent to Actor Network Theory (ANT) (Akrich 1992, 1993), who applies this idea in relation to analysis of the interactions between science and technology and human beings. She argues that science and technology are concerned with different subject matters, where science goes beyond the social world, and technical objects are 'obviously composite, heterogeneous, and physically localized. Although they point to an end, a use for which they have been conceived, they also form part of a long chain of people, products, tools, machines, money, and so forth.' (Akrich 1992: 205). She explains the concept of scripts as follows:

> Designers thus define actors with specific tastes, competences, motives, aspirations, political prejudices, and the rest, and they assume that morality, technology, science, and economy will evolve in particular ways. A large part of the work of innovators is that of "inscribing" this vision of (or prediction about) the world in the technical content of the new object. I will call the end product of this work a "script" or a "scenario." (Akrich 1992:2008)

[8] Williams (2001) discusses mainly foundationalism, the coherence theory and 'naturalistic' theories.

In this thesis scripts are thus the result of the inscription of ideas, prejudices, tastes and also values by designers (in my case studies the scientists designing the research projects) into research projects, in particular into the approaches and technologies applied in the two case studies (chapter 3). I find this definition particularly useful because it links well with my understanding of narratives.

Narratives in development often are represented as stories with a beginning, a middle, and an end (Roe 1991). They are linked to 'a set of more or less naive, unproven, simplifying and optimistic assumptions about the problem to be addressed and the approach to be taken.' (Hirschman 1968 in Hoben 1995:1008). Development narratives focus more on predicted future scenarios (Roe 1991): essentially they are predictions of consequences of certain kinds of behaviours and actions. According to Hoben (1995) specifically policy narratives origin in religion, myth or 'Western scientific' findings and represent the view of 'experts' – they then gather more followers over time in the developing nations. Different actors may represent different interests and engage in discourses and negotiations that either reinforce or challenge prevailing narratives regarding technologies. Moreover, farmers and scientists often come up with different representations of their ecological and social environment in different circumstances. There are some versions of history and 'reality' told repeatedly, some stories that are excluded: what is presented as the truth or even as a whole narrative often differs in the views and experiences of different actors (Long 2001). However, such narratives and 'received wisdoms' are not independent of human agents; they are a product of intended and unintended consequences of their actions (Leach and Mearns 1996). Modernist images, simple stories that turn into narratives, framing what is perceived as destructive to the environment as 'primitive, unscientific practices', tend to dominate the expert discourse of policy-makers (Jasanoff and Wynne 1997: 27).

Thus in the case of forestry research projects in Ethiopia, common orthodoxies used as a basis for developing interventions are the fuelwood crisis, overgrazing, soil erosion and the mining of natural resources caused by rapidly growing populations (Hoben 1995, 1996). The Ethiopian Highlands provide many examples of the production of narratives about environmental degradation. Elsewhere in Africa Leach and Fairhead (2002) stress how through such narratives, forest users are not only deprived of access to forest resources, they are also labelled and categorised in negative ways. This has implications for how they are perceived by authorities, and what role they play in decision-making, and the allocation of rights and resources, as can be seen in the example of exclosures (Chapter 3).

In my research I found that scripts and narratives about tree and soil management (see 1.4.3) in the Ethiopian Highlands were employed to define scientific theories and standardized sets of technologies. In the case studies farmers became part of the script of the scientists in (un-)knowingly assuming roles assigned to them, and they were confronted with the narratives about tree and soil management - which they had embodied already - and finally they at least partly implemented the technologies prescribed to them, such as adoption of exclosures and different soil and water conservation measures. (Chapter 3 and 5)

These technologies were brought to the farmers (by the scientists) as ‘standardized packages’ (Fujimura 1986, 1988). Fujimura uses the example of cancer research to define standardized packages:

> One concept is what I have called "standardized packages" (Fujimura 1986, 1988). It consists of a scientific theory and a standardized set of technologies which is adopted by many members of multiple social worlds to construct a new and at least temporally stable definition of cancer as well as a thriving line of cancer research. (Fujimura 1992:169)

This applies well to the situation I found in the case studies: on the one hand there were scientific theories (intermingled with narratives) on land degradation in the Ethiopian Highlands (see 1.4.3) promoted by the scientists in the case studies. These I found – in surprisingly unison voice – in the strategic papers of the scientists’ research organisations, adopted in policies as well as development strategies of the government and many NGOs in Ethiopia, and at the least semantically also adopted by many farmers in the case study areas. On the other hand, there were standardized sets of technologies, packaged in ‘approaches’, like Integrated Watershed Management (IWM) or Exclosure Management (EM) applied in the case studies. Their application in the case studies was theoretically justified by the scientists, agreed by a number of stakeholders such as farmers in the case study area that took part in the meetings where this was decided; government representatives such as the development agents or Woreda representatives; the case study scientists; and other stakeholders more specific to each case study area (e.g. priests). At the interface between them a more or less tacit – but temporary and not comprehensive - agreement was made on the narratives, the scripts and the packages to be applied.

Part of the reason why their ‘agreement’ was built on shaky ground was the difference in epistemologies of the actors mentioned above. However, their association to different social worlds – and not just one for each of them – allowed them to access and make use of different ways of knowing, provided they acknowledged this possibility. There are of course many

different ways of knowing, some better known than others. Which ones we prefer is not only a matter of personal choice but influenced by the social worlds we feel we belong to, and which epistemological foundations these social worlds chose to be theirs – in short it depends on the context of knowing. It would exceed the scope of this thesis if I tried to address all of them. Based on my experiences in the case study areas I decided to focus on sense perception, spirituality, emotions and memories, languages, authority and exclusion.

Different ways of knowing have been given different priorities by different philosophical schools of thought and can be understood through defining *a priori* and *a posteriori knowledge*. *A priori* knowledge exists without experience, it is

> independent of empirical justification to verification. *A posteriori* (or empirical) knowledge depends on experience or observation. Virtually all contemporary epistemologists regard scientific knowledge, which depends on experimental confirmation, as *a posteriori*. (Historically the *a priori*/*a posteriori* distinction has been closely associated with that between the innate and the learned. The very idea of *a priori*, as that which can be known prior to experience, encourages this assimilation, which should nevertheless be resisted.) (Williams 2001:89)

A posteriori knowledge requires the use of senses to acquire this knowledge (Williams 2001). He observes: 'There are many ways to learn particular facts about the world […] but for such information ever to have got into circulation, at some point somebody had to go and see for himself. This dependence on observation as its *ultimate source* is the hallmark of *a posteriori* knowledge.' (Williams 2001:86). *A priori* knowledge on the other hand is based on the use of reason, one example being logical intuition and reasoning applied in pure mathematics (Williams 2001). While this is not the position of Williams himself, there have been other philosophers, most prominently John Locke, who claimed that the human mind was a blank space to begin with (tabula rasa) that would then be filled with experiences (through sense perceptions). In empiricist foundationalism there are wider debates about epistemic justification that exceed the scope of this thesis. This short insight into some of the debates among philosophers about the sources of knowledge, the ways to acquire knowledge, serves however to show the dilemma many scientists are facing when thinking about ways of knowing and knowledge. Let alone acknowledging alternative ways of knowing that are neither experimental nor explanatory, there is even a fundamental difference between some natural and some social sciences:

> In physics or chemistry we seek to explain events by bringing them under laws; and we test putative laws experimentally. In history or anthropology we want something different, a kind of interpretative understanding (*verstehen*). We want to get a feel for past

> circumstances or exotic ways of life 'from the inside'. This is more a matter of sympathetic imagination than experimentation. […] the empiricist outlook has not been friendly to such ideas […] it is not easy to assimilate notions like *verstehen* to the foundationalist model of verification. (Williams 2001:91)

In the case studies the scientists, most notably the two doctoral students in the two projects, were confronted with both. Their background was empiricist, both of them were forest ecologist, nevertheless they were expected to include a social science component in their theses. Yet based on their empiricist background they found it hard to accept methods leading to '*verstehen*' as scientifically valid. While one turned towards a quantitative questionnaire-based survey, the other one got initially lost in searching for methods satisfying his curiosity to cover certain social aspects in this thesis - and finally when running out of time he presented only few of the social aspects he had been studying in his thesis. Senses and reason are thus not as straightforward ways of knowing as one might assume, and they are not necessarily going hand in hand. One can take place without the other, and one can also contradict the other. And – a fact that the scientists in the case studies sometimes forgot – senses and reason are faculties applied by all human beings to acquire knowledge, they are certainly not exclusive characteristics of scientists. Thus, knowledge held by farmers in the case studies was not restricted to some presumably stagnant or endangered pool of indigenous or traditional knowledge; it was sometimes fluid, sometimes stagnant, sometimes dynamic and sometimes static, but certainly influenced by both reason and senses (chapter 4).

While Williams discusses reason and senses in the context of empirical foundationalism, he turns to language in the context of conceptual relativism:

> Different conceptual schemes are presumably embodied in different languages. Where languages express different concepts, there must be problems of translation. So perhaps the best way to make sense of conceptual relativism is in terms of the impossibility of translating one language into another. (Williams 2001:222)

He argues that there are always words in one language that cannot be translated in another language (Williams 2001). Language changes according to its context – not only are most people living in different places using different languages, dialects and sociolects, many people change their language depending on where and whom they are talking to, and depending on the topic they are talking about. Noam Chomsky's controversial linguistic theory supports the idea of genetic transmission of the basic principles of language whom he believes to be the same for all humans. Others believe in a more behaviourist nature of language (B.F. Skinner). Rather than engaging in a debate about nature vs nurture regarding language, I consider it

more important for my research that language is the main form of human communication in oral and written form, but also in many other ways (through gestures, symbols, etc.). In my research language plays an important role as a way of knowing, as it influences how we perceive, acquire and pass on knowledge. According to Wittgenstein (1953) in his *Philosophical Investigations* the meaning of words is a result of how they are used. Constructivism adds another dimension to language: Austin (1962) and Searle (1969) brought forth the concept of 'speech acts'. These cover the actual act of speaking, the nature of the expression (demanding, promising, greeting…), and the ways of attempting to affect the people listening. The power of language and discourse was also taken up Michel Foucault (Foucault 1966, 1972). Similarly, the way we intend to use language (e.g. what thoughts do we want to trigger in other people's minds?) and which actions result from what and how we use language (e.g. what actions follow from words, gestures,…?) are of high relevance to ways of knowing in my research. (Chapter 4 and 5)

Emotions, spirituality and memories are scientifically intangible ways of knowing and have therefore only recently become objects of study in epistemology. Emotions help us to know how to make decisions – they are instinctive rather than rational. Emotions are intangible, and cannot be physically located. Equally to memories and spirituality they are the more difficult aspects of ways of knowing to describe to others – and they were also less accepted as valid by the scientists in the case studies. In fact they were defined as the opposite of scientific by some scientists during the interviews. However, there are authors who make connections between reason and emotion that may also be relevant for epistemological issues: Damásio (1994) has developed a hypothesis that in some situations rational decisions are influenced by emotions – more specifically he calls such internal feelings somatic markers that help us to make choices. Emotions thus influence the way we acquire knowledge: this applies to what we feel when we hear or observe something we want to know more about (or the opposite), and it applies also to our preferred ways of acquiring knowledge. Some people feel more at comfort with one way rather than another, and their choices for different ways of acquiring knowledge will not always be rational. Emotions can also be the intrinsic motivation for people to acquire knowledge. This also applies to memories that are always linked to certain emotions. But it is exactly this emotional link that makes memories unreliable and individual – the histories about deforestation in Ambober and the role of the Falasha (Ethiopian Jews) in this show this very clearly (see 3.3.1). Memories are the faculties that store information from the past in our minds; they are therefore only indirectly linked to ways of knowing. Similarly

spirituality is also not directly connected to ways of knowing, but it influences what and how we know. (Chapter 4)

The final key concept I am using to explain ways of knowing in the case studies of my thesis is place: 'Place can provide attachment and identity, and is connected to inherent power structures depending on who wants to/can occupy which place for which purpose.' (Gieryn 2000 in Habermann, Felt, Vogl, Bekele and Mekonnen 2012:220). Place in my understanding for this thesis is a real category. Space on the other hand is an abstract concept: 'space filled up by people, practices, objects, and representations' (Gieryn, 2000:465).

The connection between place and space in the case studies is constituted by interaction between the scientists, the farmers and occasionally others such as the DAs. The dynamic nature of space and its impact on social life affect the relation we have with places. And interfaces are deeply influenced and (re-)configured by relations, modes of representation and places. Interfaces are understood as settings where 'different interests, relationships and modes of rationality and power' come into play (Long 2001: 65).

Interfaces shape and nourish personal relations, and they provide the place for (hidden) transcripts (Scott 1990) to be expressed. They are the place where goods are exchanged, and promises are made and (not) kept (Long 2001; Mosse 2005). Thus they have a vital impact on potential ways of knowing. It is exactly through these various ways of producing and distributing knowledge that power is exercised (Foucault 1980; Jasanoff 2004), as well as through reinforcing or challenging certain socio-technical narratives. There is an underlying assumption for the continuous need for more expertise. People's own ways of knowing lose power, content and validity and are influenced strongly by what is being imposed by other actors such as scientists and extensionists.

'Indigenous knowledge' is often measured against 'scientific knowledge', as it is understood that the two are different but may complement each other. It is a simplistic view that either underestimates the salience of different knowledge systems or focuses too much on indigenous knowledge as an asset in itself, thus neglecting issues of power (Agrawal 1995). Agrawal (1995) discusses how different frameworks have been developed to categorise indigenous knowledge to make it somehow comparable to scientific knowledge, to enable scientists to draw from it and to archive it for future generations. He suggests a need 'to

recognize the multiplicity of logics and practices that underlie the creation and maintenance of different knowledges' (Agrawal 1995: 432).

But ways of knowing are also the means to gain knowledge, and to learn about the world around us. Chapter 4 demonstrates how understanding ways of knowing of farmers and scientists is important in order to understand how these different actors (and their institutions) come to know things. Moreover, it argues that ways of knowing are more diverse than defined above, and that these multiple ways of knowing mutually influence each other. Evidence for this can also be found in anthropological and spiritual research (Akya 1976; Broomfield 1997; Schareika and Bierschenk 2004). My research therefore adopts the position of Millar, Kendie, Apusigah and Haverkort (2006) and Powell (2006) who refer to knowledges in the plural. However, such aspects of plurality in knowledges and ways of knowing as well as sense perception, language and emotion rarely find consideration in agricultural research projects that seek to find solutions based primarily on logic and reason. This common way of thinking is influenced by the lop-sided world view that Western science has the ownership of ultimate wisdom and truth. Turnbull (1997: 552) describes this as an imperialist position: 'Scientific knowledge is uniquely distinguished by its rationality and methodology. It is universal, objective and true within the limits of its own fallibility. […] Its methods are essentially experimental, reductionist and empirical.' These strict and dogmatic definitions serve primarily to label non-scientific knowledge and practices as opposed to scientific ones – such definitions are used 'to tell others that they are not scientific' (Gieryn 1995:403).

When farmers and scientists meet in agroforestry projects their ways of knowing related to what they do and represent, as well as their ways of knowing related to who they are, are confronted with each other. Hence, it is not surprising that farmers and particular scientists often come up with different representations of their ecological and social environment in different circumstances.

The nature and contexts of citizenships are changing as well as the engagement between science and citizens. The boundaries to distinguish between expert and lay knowledges, North and South, indigenous and modern no longer seem salient (Leach et al. 2005). Both farmers and scientists are embedded in an intricate and complex network of influences on the way they know and the way they do things. However, there is also an increasing recognition of farmer experimentation, and appreciation of farmers' research and innovation processes, as well as of the ways they apply scientific methods on on-farm research plots (Scoones and

Thompson 1994). Scoones and Thompson (1994) discuss knowledge as a social process that is highly influenced by issues of power and agency: it is about exclusion and the imposition of ways of seeing; it is beyond rationality and careful planning and enters ideologies and politics. The authors emphasise that social, political and ecological aspects have been neglected in agricultural development and need to be addressed more vigorously.

External determination is just one part of the picture, and focusing on external structures only denies the possibility of subordinate actors to react to the way such external interventions affect and transform their lives (Long and Long 1992; Long 2001). In exploring ways of knowing and their interaction, I therefore take an actor-oriented approach that seeks to understand the intersections between the different social worlds of scientists and farmers, and how knowledge is framed and influenced by the interaction and dialogue between them (Long and Villareal 1994) in order to better understand the roles of ways of knowing in research projects.

2.1.3 Science and Development Studies and Science and Technology Studies

Development Studies (DS) and Science and Technology Studies (STS) share a critical and reflective approach that aims at empowering citizens in the areas of knowledge and expertise. But there are differences in their analytical traditions for exploring these issues. 'While STS has relatively recently come to an interest in lay knowledge and experience-based expertise, DS by contrast draws on a much longer tradition of work examining local knowledge and practices and their conceptual and social underpinnings' (Leach and Scoones 2005: 16). A linkage can be seen in the laboratory studies of Latour and Woolgar (1979) and Knorr-Cetina (1981), where the scientists' work life is analysed from an anthropological perspective. In these studies it became clear that the nature of scientific knowledge was like other forms of knowledge, thus the differentiation between experts and non-experts loses its meaning (Leach and Scoones 2005). In this area, STS finds a lot in common with DS where social anthropological work emphasised social and local embeddedness of knowledge and beliefs (Leach and Scoones 2005). In DS, indigenous knowledge and local knowledge are often seen as 'complementary partners', and 'rural people's knowledge frames technical problems and agendas, and defines what relevant data to include or exclude' (Leach and Scoones 2005: 19).

In STS, Actor Network Theories (ANT) claim that a divide between technical and social issues is not possible: constructing facts is a collective process according to Latour (1987). In this thesis I draw on the work of Akrich (1992, 1993) when looking at the technical approaches used in the case studies (Chapter 3). The introduction of technologies and approaches by the scientists

appear similar to Akrich's (1992) description: designers (in the case studies the scientists) define actors (the farmers) with specific attributes, for example rich/poor, adopters/non-adopters, male/female. These actors are to become the users of the introduced approach or technology, 'like a film script, technical objects define a framework of action together with the actors and the space in which they are supposed to act' (Akrich 1992: 208). The users should then act as a 'good public' (Felt and Fochler 2010) and assume the roles assigned to them in the script. However, there is always a difference 'between the designer's projected user and the real user, between the world inscribed in the object and the world described by its displacement' (Akrich 1992: 209).

More recently, in development 'citizens are conceived as beneficiaries, customers and users of services provided by a development state or […] liberalized markets' (Leach and Scoones 2005: 22-23). As in scientific decision-making, where citizens are often invited to become participants in public engagement processes (Felt and Fochler 2010), the public as development beneficiaries also get enrolled in 'participation seen in terms of individuals choosing among an array of options and services, but not playing a major role in setting agenda of policy or technology development' (Cornwall and Gaventa 2001 cited in Leach and Scoones 2005: 23). Others argue that empowerment should be about more involvement of socially and economically marginalised people in decision-making over their own lives (Guijt and Shah 1998 cited in Cooke and Kothari 2001). It means a greater involvement of local people's perspectives, knowledge, priorities and skills (Cooke and Kothari 2001). However, the reality is often different. Therefore in Chapter 3 I address the issues of enrolment and participation in the case studies in order to see how projects' rhetoric about participation were applied in practice.

A useful concept to understand the way scientists often act and think in practice, and how they try to overcome the gap between them and the research clients, are Fujimura's (1992: 205) 'standardized packages' (as discussed in 2.1.1). The scientists as representatives of the projects assume a powerful role in communicating the findings and conclusions to others. Facts are often constructed and turned into stories that turn into narratives. By black-boxing, for example, uncertainties and assumptions away from attention and scrutiny, scientists close controversies (Jasanoff and Wynne 1997; Keeley and Scoones 2003). Scientific knowledge is seen as universal, rational, modern and based on facts, and facts are made up of numbers in most cases. The spread of quantification has also contributed to a 'reconfiguration of expert

knowledge' (Porter 1994: 52). This quantification is not only a problem of science; it is a social and political problem as well:

> In modern times, too, quantification has been as closely tied to administration as to science. Indeed, its use in science derives not only from a faith that the laws of nature are written in mathematical language but also from the rigors of scientific communication, the administration of knowledge and the need for trust. […] Scientists, social scientists, and engineers depend especially on such tools to justify their activities to governments and to the public at large. (Porter 1994: 36)

Moreover, the world around us is made up of standards and classifications (Bowker and Star 1999). Standards are 'agreed-upon rules for the production of (textual or material) objects' (Bowker and Star 1999: 13), and they extend over time places (Bowker and Star 1999). Standards are key to knowledge production; however, their dimensions are idealised, as they 'embody goals of practice and production that are never perfectly realized' (Bowker and Star 1999: 15). The linkage between standards and classifications is not straightforward but vital for my research as it relates not only to standardisation and the use of classification systems by farmers and scientists, but also to the validation of success by standardised indicator systems common in scientific evaluation as well as donor-specific evaluation and monitoring systems. Bowker and Star (1999: 15) maintain that

> classifications may or may not become standardized. If they do not, they are ad hoc, limited to an individual or a local community, and/or of limited duration. At the same time every successful standard imposes a classification system, at the very least between good and bad ways of organizing actions or things.

Scientific knowledge still holds a privileged status, 'as a consequence of the post-Enlightenment faith in science, the functional needs of administrative agencies, and the social authority conferred on professionals in industrial societies' (Jasanoff and Wynne 1997: 51). Alternative representations of tree and soil management that refer to ways of knowing rather than a simple documentation of local or indigenous knowledge are rare. Exceptionally, and regarding trees, several contributions in Rival (1998) explain how trees come to play a certain role in people's lives, which symbols and beliefs they allocate to them and what makes them value or devalue trees and soil in certain ways.

In addressing ways of knowing in research projects and policy, it is also essential to understand how 'success' is produced or constructed, and who has control over the interpretation of events. Specifically in natural sciences, simplified procedures following a blueprint prescription are common. Such processes in 'a particular logical progression' are also described by Harrison and Watson (2012:939):

> (1) Identification of problem (e.g. poor NRM) and aim (improved NRM); (2) find solution (technique); (3) implement (in partnership with someone with resources and capability). The natural resources and techniques were the focus and the starting point. The local people with whom they worked on the ground were seen as component parts of a complex system. (Harrison and Watson 2012:939)

People, ideas, interests, events and objects are all correlated in a network that makes up the order of a successful project (Latour 2000 cited in Mosse 2005). Subordinate actors both reject and maintain policy models, depending on how it serves their interests (Scott 1990). Thus, policy ideas incite alliances and divisions within projects, farmers use them to make claims or to refrain from participation, and support or refusal to engage are framed based on how networks react to these ideas (Mosse 2005). This convergence of issues of enrolment and participation, co-production of science and policy, power and expertise and the use of framing and standardisation is central to the debate my research is addressing.

In light of the diversity of knowledge traditions around the world it is highly questionable whether 'modern science should be seen as setting the epistemological standard' (Turnbull 1997: 552). Turnbull differentiates the localist position as a contrasting position to this: he argues that all knowledge is value laden and that 'modern technoscience is exploitative, hierarchical and antithetical to women and the south' (Turnbull 1997: 552). Likewise Latour and Woolgar (1979) and others argue that all knowledge, even 'science' is local, but modern science is distinct for the reach and power of its actor-networks. In contrast to "modern sciences", which attempt to be context-detached, upscalable to different parts of the world and universal but precise, local knowledge is 'situated', and its diversity is embedded in the locality, the actors and the ways of knowing and learning:

> different people know different things in different places, and learn new things in different ways. These differences are reflected in and reinforce power and weakness. Scientific establishments and local elites (male, less poor, 'progressive') link together and monopolize some types of knowledge, while those who are weaker, dispersed and local are marginalized. (Chambers 1994: xiv-xv)

Haraway (1988) and other feminist authors also promote a more emancipated approach to scientific epistemologies. She specifically emphasises that all knowledge is 'situated', she argues 'for politics and epistemologies of location, positioning, and situation, where partiality and not universality is the condition of being heard to make rational knowledge claims' (Haraway 1988:589). Thus, my research aligns with those who recognise 'differences between knowledge systems but are concerned to find ways in which they can coexist' (Turnbull 1997). These differences will be discussed in detail in Chapter 4. That chapter also shows the

multiplicity of roles and identities of participating actors in the research projects and that these deeply influence their ways of knowing and knowledges. It shows that knowing is inseparable from cultural, economic and political processes.

This section provided an overview of the theoretical framework I am applying in my research. It has shown how social worlds can be used as a lens to understand intersections between farmers and scientists, and how this influences their cooperation in research projects. It has also linked social worlds to issues of power where different actors demarcate their fields of expertise and knowledges with certain symbols, languages and metaphors to include some voices, but exclude many others simultaneously. Different knowledges emerge based on different ways of knowing, but authority and power is not ascribed to all of them. Ways of knowing are the ways by which human beings can acquire knowledge (Truncellito 2007). Some may be more influenced by sense perception, others by emotion or reason. Different ways of knowing are not better or worse, more effective, or less effective, on the contrary different ways of knowing broaden rather than narrow what kind of knowledges human-beings can acquire, and how they can do so. But the plurality of different ways of knowing is often unrecognised and in many parts of the world, and particularly among many scientists, reason is considered superior to all other ways of knowing. This also implies that to gain and produce knowledge one must have a specific type of training or a status as 'expert', rather than being a 'mere citizen':

> The tacit division of labour between an expert who produces knowledge and a citizen who consumes it has to be rendered less asymmetrical by understanding the citizen as a person of knowledge. The worker, the peasant and the craftsman are all citizens of knowledge about science. This understanding cannot be devalued as 'ethnoscience' while expert understanding is 'philosophy of science'. Such a hierarchy or devaluation creates the possibility of the museumization or appropriation of these other knowledges. Strangely, even at a time when science is appropriating and patenting peasant knowledges, there is no epistemic acknowledgement of their status. Science begins a form of strip mining, where knowledge about local drugs, therapeutics, soils and seeds is abstracted without considering the philosophies they are embedded in. (Visvanathan 2005:91)

In my research I combine the concepts of social worlds and actor-oriented approaches with a critical look at how narratives, framings and power enable some ways of knowing while obscuring or marginalising others. Further, I draw on approaches from STS to explain how scientists are designing the scripts for research projects, and how users are enrolled to participate. I argue that standardised packages play a central role in how scientists define expertise and power, and how the research is represented to others.

The conceptual framework explained above provided a solid basis for developing an appropriate methodology for my research. Step by step the methodology was adapted to the conceptual framework and then tested in the field. My research required repeated interaction and longer periods of research with farmers and scientists, as well as policy-makers and NGO representatives. The next section of this chapter explains in more detail how this methodology was developed and implemented.

2.2 METHODOLOGICAL APPROACH

This study was part of an Austrian Science Fund (FWF) project called 'Ways of Knowing – When Local and Scientific Epistemologies Meet in Rural Development' (P20685-G14). This was a project based on a proposal that I wrote in 2007 in order to obtain funding for my research. A second component of this project related to research on ways of knowing in livestock-breeding systems in Uganda and Ethiopia which was carried out in parallel with this study. However, the actual research presented in this thesis was independent of the joint activities in that project.

2.2.1 SELECTION OF CASE STUDIES

As explained in 1.4.1, I was the coordinator of an Austrian funding programme for research for development at that time. This programme based at the Commission for Development Studies (KEF) funds small research partnerships in developing countries. There is always a partner in Austria and at least one in the partner country: the role of manager and supervisor falls to the Austrian partner. The proposals undergo a process of peer-review by two external reviewers and are then discussed in a board meeting. The reviews and the discussions are based on a specific list of criteria (see Appendix 1). There is no ex-post evaluation; therefore the success of the project again is evaluated against the list of criteria and the original Logical Framework (logframe) in the proposal.

This professional background and my private interest in the life of farmers (see 1.4.1) led me to study the ways of knowing of farmers and scientists in research projects. I selected Ethiopia because it is the country with the largest number of KEF projects, and because it is also a priority country of the Austrian Development Cooperation (ADC) (see 1.4.2). I focused on two case studies in the Ethiopian Highlands, one in Oromia Region (Galessa, Case Study 1: CST1), and one in Amhara Region (Ambober, Case Study 2: CST2) because of their similar background (see chapter 3) and their accessibility in terms of infrastructure. Both case studies had a project funded by KEF and were led by an Ethiopian doctoral student funded by the ADC and supervised at an Austrian agricultural university (BOKU). However, neither case study can be

defined as stand-alone, packaged project with its clearly demarcated boundaries. These projects are embedded in a network of other research projects and related activities that are more or less connected to the KEF projects (see Figure 3.5 and Figure 3.9 in Chapter 3). Thus, it was sometimes difficult to differentiate between the doctoral studies and the projects, as the doctoral students were also the Ethiopian project managers of the KEF projects. The advantage of studying the projects of two doctoral students was that there was sufficient documentation of their research. This holds true especially for CST1: the project leader completed his thesis based on his publications in scientific journals. At the time of my studies he had already published eight papers about his thesis research. In the case of CST2 it was different – he had to write a monograph. That again was an advantage for my studies, because he wrote at length about his research and experiences in Ambober in the monograph. Because of their recent or current status as doctoral students they also showed a lot of understanding for my situation and my research interests. They were keen to learn more about the findings of my research. However, they were not the only scientists I interviewed in the context of the case studies. I will elaborate more on this in chapter 3. A disadvantage of focusing my work on their case studies was that their own doctoral studies had forced them to prioritise and rush through their projects, because as scholarship holders they were obliged to submit and defend their theses within three years. Because of that and the specific type of research required for a doctoral thesis at BOKU, the case studies were to some extent biased to produce fast outputs that could be presented in a straightforward way to the satisfaction of supervisors and examiners (at the time of their defence the supervisors were also the 'internal examiners'). The requirements in the students' department put a focus on bio-physical research, and the implementation of empirical research, even though the supervisors in both cases also encouraged an *additional* focus on social issues. The presentation of the research was usually done by presenting tables, graphs and figures rather than descriptive and reflective text passages. Therefore the research did not involve as much social research and interaction between farmers and scientists as I had hoped for at the outset.

At the time when my research started, CST1 had already been concluded, so few on-going activities could be observed. The topic was the impact of selected indigenous and exotic tree and shrub species on soil fertility improvement and fodder production. The partnership project enabled the doctoral student to expand his research and include a wider survey than originally planned. His studies were carried out following the participatory research activities and household surveys done by the African Highland Initiative (AHI) project. The Ethiopian researchers refer to the research activities in Galessa as 'the watershed project', so I will also

use this term as a summary for these interlinked research activities using the acronym GWP (Galessa Watershed Project). The main researcher and doctoral student will be called GR (Galessa Researcher).

CST2 was on-going, but as the doctoral student was busy with his research as well as undergoing a period of personal tragedy it was difficult to coordinate joint visits. During the time spent jointly in the area fewer direct interactions with farmers were organised by the project in comparison with CST1 (e.g. group meetings, participatory workshops). The two projects had different objectives; participatory meetings took place at the beginning of CST1, but it was not intended to continue such meetings throughout the project because the project had not planned a continuous participatory process. This limited my observation to informal encounters. The KEF partnership project was developed during the first stage of the researcher's doctorate. It was submitted to the donor in 2008. The doctoral student will be called Ambober Researcher (AR) in this thesis. AR is also the project manager of the KEF project. This partnership project is one component of his doctorate. It is referred to as 'the Exclosure Project' (EP) by some farmers and the scientists. I also used part of the thesis of a second Ethiopian doctoral student working there at the same time. Unfortunately I could not meet him for an interview because our stays in Austria and Ethiopia never overlapped. He is referred to as AR-DS.

To differentiate between the Austrian and the Ethiopian respondents I add A for Austria and E for Ethiopia, for example, A-Scientist, E-Policy-maker. When referring to literature of the projects published by GR or AR, I do not provide the direct quote but refer to their acronyms in order to protect their anonymity. If there is a direct reference to a person in the quote, I replace the name with NN.

I use many direct quotes from primary sources in the text. These are based on the interactions I had with different respondents as explained above. I have chosen to do this because I want to give their voices as much authenticity as possible. I therefore add quotes to the text when a specific explanation has been given about something, or when the respondents have explained issues that are particularly important for them, if they have indicated so during the interaction, or to particularly emphasise key messages in the text. I quote respondents by indicating the date and type of interaction (e.g. interview, 29.9.2010), and in the case of the farmers I also add their respective village (e.g. Farmer, Woglo, interview, 15.6.2010). To protect their anonymity I refer to the respondents only by their professional titles, such as farmer, scientist,

policy-maker and donor representative, and I add male, female and their age to give them a clearer identity.

2.2.2 RESEARCH APPROVAL

To be able to work in Ethiopia, I had to bring a letter of recommendation from my university, my embassy in Addis Ababa, and letters issued by my partner institutions that provided an entry point to the field sites. The partner institutions were the Holeta Agricultural Research Centre (HARC), a subcentre of the Ethiopian Institute for Agricultural Research (EIAR), and the Amhara Region Agricultural Research Institute (ARARI) and its subcentre in Gondar, the Gondar Agricultural Research Centre (GARC). For more details about these organisations see 1.4.5.

The latter documents were presented to the respective *woredas* (districts), which then gave written or oral consent for my work to continue. In the villages I was introduced to the *kebele* chairmen and the development agents[9] (DAs), who were both welcoming and supportive of my work. From their point of view it was certainly an advantage that through my job I was associated with a federal and a regional research institution and that I arrived in the villages in the company of my research partners. At both sites I was working with a junior researcher who facilitated my entry into the community, helped me to understand the local context and translated my interaction with farmers and local authorities. I refer to them as 'research partner' in the text.

2.2.3 RESEARCH PROCESS AND METHODS

2.2.3.1 Selection of Respondents and Sample Size

I started with the project managers in Austria and Ethiopia to select the scientists, and then I followed their recommendations in a snowball system (see table 2.1). This also led me to interview policy-makers and NGO representatives. I tried to achieve a representative sample of different education levels, careers, gender, age and nationality, but this was constrained by the fact that the respondents should have had some affiliation to and ideally practical experience in the case studies. In spite of my best efforts, the representation of female respondents was poor, especially among scientists, policy-makers and donor representatives. I tried to at least

[9] Each administrational sub-unit of a district (= *kebele*) in Ethiopia has been assigned three development agents to assist the communities in their development activities in the fields of agriculture, livestock and natural resources.

invite an equal group of women for the focus group discussions (FGDs). But when asking for female scientists, I was repeatedly told that there were no female scientists in the research organisations. Therefore I could only include women whom I already knew personally.

In the villages my starting points were the project managers and the local DAs. Initially I held a meeting with a small group of farmer representatives. The criteria for selection that I told the DAs were gender, wealth, age and an interest in trees and soil. These farmers were also intended to be my initial key informants. Their role was to provide an entry point, and to help me to get to know their villages in terms of its social structures as well as the agro-ecological context. However, it turned out that the key informants were often model farmers or village chairmen, close relatives and dominantly male and rich. Therefore I decided not to apply snowball sampling to select farmers for interviews.

I then selected the respondents for individual interviews based on the village maps (see 2.2.3.3). The criteria for selection were: representative in terms of age, gender, wealth, landownership; connection to projects; model farmers and/or key informants; farmers with other functions in the village and farmers without such attributes; location of household in the village area; if applicable ethnicity; duration of residence in the area; female-headed households; people seen as knowledgeable by the community. The latter was important because in talking to people outside of this 'category' I could see the differences between what some people considered as 'knowledgeable' as compared to others.

Table 2.1 presents an overview of the actual sample for all respondents. The majority of the scientists and policy-makers were Ethiopian and had some study experience abroad. Among these many did their masters and/or doctorates or PhDs at BOKU University in Austria, others in Germany, Sweden, The Netherlands, Cuba, UK, Kenya, US, Switzerland, Russia and Spain. Regarding their expertise, many of them were foresters, others were specialists in soil and water conservation, and few were specialised in other bio-physical areas and social sciences. Only about 25% claimed to have a background in farming, and only two out of the whole sample for scientists and policy-makers (n=37) were women. Three were aged above 65, the majority was between 30 and 45 years old.

Table 2.1: Actors and number of respondents

Actors	*Respondents in case studies*	*Respondents in the policy context of the case studies*	*Number of respondents*
Farmers	Farmers, project contact farmers (69)*	Local and regional institutions (church, social institutions) (6)**	Galessa: Interviews: 33 FGDs: 18 Landscapes: 16
			Ambober: Interviews: 36 FGDs: 24 Landscapes: 13
Scientists	Austrian project manager (2)	Other researchers at BOKU University (3)	Austria: 5*** Interviews: 3 FGDs: 4 Landscapes: 4
	Ethiopian project manager (2)	Other researchers at research organisations in Ethiopia (ARARI, GARC, HARC, EIAR, FRC) (12)*	Ethiopia **** Interviews: 14 FGDs: ca 30 Landscapes: 2
Policy & Politics	*Woreda* (3), DAs (3), local project coordinator (1)	Ethiopian Ministry of Agriculture (2) NGOs (2) Other (3)	Ethiopia: 14 (only interviews)
		Austrian Ministry of Science/ Ministry of Foreign Affairs/Austrian Development Agency (4)	Austria: 4 (only interviews)

Note: Farmers = respondents of key informant interviews, SSI and on-farm visits, participatory mapping, seasonal calendar and village walks, landscape ranking; others = respondents of interviews, FGDs and landscape ranking

* This number counts only the interview partners, as the participants in FGDs or landscape rankings were often the same people as the ones already interviewed.

** Some of the farmers interviewed were members of social institutions, or chairmen of such institutions. It is therefore difficult to say how many members of such institutions I have interviewed, as they also count as farmers.

*** This number is lower than in Ethiopia because these were the only Austrian scientists directly involved in supervision and research related to the case studies. 3 out of 5 were interviewed, and 4 out of 5 participated also in the FGDs and landscape ranking.

**** These are only the scientists I interviewed personally. For each FGD there were additionally 5 ARARI, 7 HARC, 6 GARC and 10–15 FRC scientists participating. The number of participants at FRC was unclear because people kept on moving out from the discussion.

Regarding the case study sites, table 2.1 gives an overview on the overall sample size. Galessa Koftu is comprised of 526 households. While key informants were interviewed in all six villages belonging to the watershed (14 key informant interviews in seven villages: Abeyi, Tiru, Sombo, Gebi, Toma, Kamate, Ameja), most of the research focused on the villages of Tiru and Sombo in the watershed, and one village outside (Abeyi). These villages had 27 households (Tiru, Sombo) and 40 households (Abeyi) respectively. The number of in-depth interviews was 33

(including the key informants) with respondents in three villages (Abeyi, Tiru, Sombo); six of them were repeated for clarifications and additional information. The respondents were 20 men and 13 women; of these, eight were female-headed households. Among the respondents 15 people had their birthplace outside of Galessa. Almost all were Oromiffa speaking, and five spoke Amharic as a first (one person) or second language (four people). Almost one-third of the respondents were between 30 and 40 years old.

The number of households in Woglo and Wojnie was 263. FGDs were held separately with men and women in the two villages. At the beginning of the research in Ambober one key informant meeting with three representatives of the two villages (Woglo, Wojnie) took place in February 2010. Another key informant meeting with four representatives of the two villages in Gondar was held in February 2012. I held in-depth interviews with 36 farmers, including the six key informants, in two villages (17 in Woglo, 19 in Wojnie) and talked to at least four of them repeatedly. The respondents were 26 men, ten women; of these, nine were female-headed households. The largest age group was between 50 and 60 years old. Fourteen people (about 40%) had their birthplace outside of their current village. Additionally there were four whose parents had not been born in the area but had moved to Ambober before they were born. All were Amharic speaking. According to their birthplaces, the people who migrated to Woglo and Wojnie in the current or previous generation were of mixed descent, but according to their origin were most probably Qemant, Faqui (leather workers) and Asmari (singers); some of them were also of Oromo origin because many Oromo who were Derg soldiers from the southern parts of Ethiopia stayed in the Azezu area after the downfall of the Derg.

2.2.3.2 Background to the Use of Methods

The research follows an ethnographic approach (Bernard 2002) that makes use of elements of Grounded Theory (Glaser and Strauss 1968) in data analysis following the approaches suggested by Corbin and Strauss (2008). Data collected were qualitative as most of my research was focusing on social worlds, relations and learning experiences and interfaces and the impact on the respondents' epistemologies, which are difficult to assess with quantitative methods. For secondary sources the research draws on a wide range of literature, reports, personal contacts and museum visits in Addis Ababa. I used statistics, project findings, bio-geographical data, workshop documentation, policies, concept notes, publications and reports of the case studies. Other sources of information were travel reports of European expeditions to Ethiopia, and illustrations and papers published in Ethiopian journals.

I applied participant and non-participant observation to the social worlds of both farmers and scientists to learn more about their different perspectives and lives. The observations were documented by note-taking, tape or video recording and photographs. Throughout my research I also kept a reflective journal that included comments and personal perceptions of the observed dialogues, workshops, meetings, social worlds and daily lives of scientists and farmers. This took place during field visits of scientists to field sites and villages, and through visits to their workplaces, conferences and libraries, by visiting farming communities and by spending extended periods of time in the villages. For this purpose I repeatedly visited the workplaces of the scientists, as well as the institutions involved in the case studies. I looked at the infrastructure available, the social life in the institutions, and interactions between different scientists. I attended different meetings and workshops where these scientists actively participated.

Regarding the social worlds of farmers, observation required prolonged contact and stays in the villages. I focused on observing aspects of tree and soil management, understanding the roles of trees and soil in people's lives, what social institutions were important in the villages, which social structures existed in villages, who were the main actors working with the scientists, and who was seen (from inside and outside the communities) as an 'expert' in tree and soil management and why.

To learn more about farmers' ways of knowing I tried to spend as much time as possible in the field, observing and engaging on an informal level. A good opportunity for this was the time after the interviews when people would share *bunna*, *araqe* or *t'ella* with us, as well as the homestead visits. I also considered the village walks very insightful, as while we were walking we met different people along the way and I could observe different occasions where people were interacting with trees and soils. During the formal and informal conversations with farmers I learned which ways of knowing they practised, either because they told me, or because I could see and hear by myself how they were interacting with the world around them. Some farmers were very emotional when talking about their memories about trees and forests of the past, and how they were playing there as children. Others would put much more emphasis on the trainings they attended, and the information they got from the radio or meetings. Equally different was the engagement of people with trees and soils – some would have a more physical approach and would walk around and touch trees and soils and thus demonstrate their feelings and their knowledges about them, others would be much more distanced and stop in the middle of the homestead while giving their explanations.

In the villages I had to work with translators for Amharic and Oromiffa. This job was done by my research partners. While I managed to acquire a good understanding of Amharic throughout my research, I could not study Oromiffa at the same time. I decided on Amharic, because it is used more widely and also understood in most parts of Oromia, while being aware of the problematic connotation of using a language associated with oppression (see 1.4.4.2). To check on bias in the research with farmers in Galessa, an additional translator was hired for triangulation towards the end of the data collection. For scientists, policy-makers and DAs, the language of communication was either English or German; sometimes during meetings Amharic was also included.

2.2.3.3 Research Process

I went to Ethiopia three times for field research. The first stay was for four weeks in May 2009 to prepare the field study and collect some key documents. Most of the empirical research was carried out from September 2009 to July 2010, and then from November 2010 to March 2011. The remaining time I spent partly in the UK, and in Austria. During the time I spent in Austria I interviewed scientists and policy-makers associated with the two case studies and I collected other relevant documents. I visited Ethiopia for private reasons in 2011–2012 and I also went there for some project-related work in June and July 2012, and again in October 2012. The numbers of interviews and respondents are listed in Table 2.1.

In Ethiopia I lived in Addis Ababa in the first year, because CST1 was closer to Addis Ababa. In the second year I moved to Gondar to be closer to CST2, where I also stayed during all consecutive visits. I lived in hotels and apartment buildings when I was in the city; when going to the rural areas I stayed as close to the villages as possible. In Galessa I was hosted by the contact farmer of the GWP. In Ambober I had to stay in the *kebele* village in the storage room of the veterinarian. The *kebele* was located one to two hours' walking distance away from the villages. However, this arrangement could not continue after September 2010, and staying there became increasingly more difficult after that.

I repeatedly visited both field sites during all seasons of the agricultural year. I usually went to the villages for a time period of between one and 14 days per stay, depending on the availability of my research partners and the farmers' work situation. The duration of my stays there was constrained by the logistical situation, as we had to bring all food and other

provisions for the entire stay with us. Finally, I spent a total of about five months at the two case study sites.

I interviewed scientists as well as staff of development and Austrian and Ethiopian government organisations, either in semi-structured interviews or focus group discussions. One *woreda* official and two DAs of the Makgsegnit Woreda Office of Agriculture and Rural Development (WOARD) were interviewed. This is where Ambober is located. The *woreda* of Galessa is Dendi. There two officials and one DA of the Dendi WOARD were interviewed, and the PA chairman of Galessa as well as the local project coordinator of the GWP.

Figure 2.1: Result of village mapping in Tiru, Galessa.

Figure 2.2: On-going village mapping in Abeyi, Galessa. Women participate by giving comments, men are doing the map.

Figure 2.3: On-going village mapping in Wojnie, Ambober. DA in colourful shirt and priests to the right watching over the farmers.

Figure 2.4: Result of male-only village mapping of Woglo area, Ambober.

After the initial meeting with the key informants (2.2.3.1) at the case study sites I continued with village walks, participatory village mapping and seasonal diagrams. At this point the DAs still invited the key informants and other farmers, which limited my possibilities to influence the selection. However, I asked them to abide to the same criteria as for the initial selection of key informants (2.2.3.1). I then prepared a village map for each village (Figure 2.1, 2.2, 2.3, 2.4) together with the key informants and the other farmers. In Wojnie priests and DAs also joined

the discussion (Figure 2.3). In all cases except for Woglo other farmers who were passing by also joined in. Women only participated in Galessa, but not in Ambober.

The farmers used natural material to draw a map on the floor, and I added labels on paper when it was required for my notes. The farmers indicated houses, rivers, roads, mountains and forests. I asked them to specifically point out areas of severe soil erosion or other forms of degradation or risks, such as frost in Galessa. Then they made a list of household names for the village and indicated the following criteria:

- Wealth (based on their own criteria, which were also recorded)
- Knowledge of trees and soil (people who were known to know a lot about trees and soil and sometimes shared this knowledge with others)
- New/old household, migrants
- Female-headed households
- Other specific characteristics

This later helped me to elect respondents in order to gain a representative sample for each village (see 2.2.3.1). I also filmed the mapping, which provided me with interesting insights about the processes going on during the mapping. For example, in Ambober not only women were totally excluded in both villages. Only a handful of powerful actors took charge of the process. In Galessa, it was much more mixed: men and women, rich and poor, old and young, all participated. I was trying to find a female translator to do separate mapping with the women in Ambober, but I only managed to find one at the end of my research period.

The same groups who did the mapping also did the seasonal diagrams. The seasonal diagrams resulted in a list of activities for men and women throughout the year, as well as the main cultural and religious events. This was very useful for me to better understand the life of the farmers. However, in Ambober the lack of contribution of different groups in the village (and the lack of women all together) lead me to have serious doubts about the value of this exercise.

The final preparatory exercise was the village walk. In Galessa the walk for one village lasted about half a day; in Ambober it was one full day per village. It was planned as a walk with one or two persons across the village, guided by the key informants without any indications from me as to where I wanted to go. While in Ambober we met many people on the way, they did not join us for long, and no women stopped to talk to us. In Galessa many people joined the

discussions on the way, and sometimes up to 15 people accompanied us for at least some of the time, including women.

The main part of the empirical data, however, was collected through conversations with farmers, scientists and policy-makers, using semi-structured question guidelines. These guidelines were important in the beginning, but after some time I remembered the questions and topics and only referred to the guidelines occasionally. The interviews increasingly turned into conversations. This informal conversational style proved valuable to understand emotional, sense-making and other alternative ways of knowing rather than only reason-based ways of knowing.

The interviews with farmers took place at the homestead of the farmers in most cases. They also involved a visit to the homestead garden of the farmers. Other people were interviewed in their offices or in quiet corners of public places like restaurants.

In Galessa, the semi-structured interviews were initially documented in writing, because my research partner expected farmers to object to digital recording. After the farmers agreed, I started to tape-record the remaining interviews. In Ambober all interviews were recorded. The interviews were later transcribed and analysed. Each interview started with an informal introduction, where I introduced myself, explained the purpose and background of my research and encouraged questions. Literate respondents received a project information flyer (in English, Amharic or Oromiffa) and the informed consent form (in English). This consent was given orally or in signing the form. Illiterate respondents were informed about the contents in their own language, and their consent was given orally.

After concluding the individual interviews, farmers and scientists were invited to FGDs (Table 2.1) according to the same criteria as explained in 2.2.3.1. I separated the groups as follows:

- Farmers: One group per village. In Galessa men and women joined together in the groups. In Ambober I organised separate FGDs for women with a female translator.
- Scientists: One group per institution (BOKU, ARARI, HARC and the Forest Research Centre [FRC], another subcentre of EIAR).

FGDs are usually limited to six–eight people, and discuss in detail a specific topic (Mikkelsen 2005); however, in my case this rule was difficult to put into practice. In one case in Galessa, in the village of Abeyi, a very large group of around 25 people participated. And at the FRC in Addis Ababa there was confusion about the task, and researchers showed up to attend a

seminar rather than an FGD. In that case the number was initially about 15, but when they realised the purpose of the meeting about half of the people left. The main topics discussed with farmers evolved around tree and soil management, adoption and innovation, and the presence of research. In the case of the scientists, the same topics were addressed plus an additional question about the impact of policies and the relation of science to policy-making.

The respondents received a short methodological description of how the FDG would take place, who would participate, and a rough outline of the topic. For the scientists, I moderated the FGDs myself. For the farmers, this had to be done by my research partners. The FGDs lasted between one and two hours and were digitally recorded with the consent of the participants. Additionally, I made observation notes during the FGDs on people's interactions, behaviours and participation.

During the interviews I realised that I wanted to try another method to assess the understanding of farmers and scientists regarding landscapes. For this purpose I selected a random sample of 24 landscape photographs of mountainous areas from all over the world, including different parts of Ethiopia. I showed the photographs to different respondents from interviews (in both the research and the farming community, see Table 2.1). While I am using some of these data as background information, I decided not to include the full analysis of these data in this thesis, as it addresses a topic leading away from my main argument.

2.2.4 Critical Reflection on the Methods

There are certainly advantages in working with national and regional research organisations as partners. First of all, it opened many doors to me when I was trying to interview scientists and policy-makers in Ethiopia. I had no difficulties in getting permission to work on the *kebele* level. I was introduced to all the authorities in charge from the *woreda* to the village level, and I was never questioned as to what my intentions were, even during the sensitive time of the elections in Ethiopia (May 2010). However, when we (my research partners and I) started interviewing we were accompanied by DAs, *kebele* workers or other political agents in the villages during the first days.

The more challenging aspect was to find out if the respondents really were representative of the sample I had defined at the outset. After I had done the village mapping this was quite clear, but in the beginning, when my research partners and I were working with key informants who were assigned to us by other actors, it was difficult to assess what agenda they were

pursuing and whom they were representing. Indeed, it was challenging to get closer to those groups seen as poor and thus often marginalised and disempowered in the villages to achieve a balance in our sample. When I interviewed farmers falling into this 'category', they often told me that they could not participate in social institutions because of financial and labour shortages (see also 4.2.4). Thus they became silenced and invisible. In Galessa, especially, I sometimes had real difficulties in managing to talk to people who were not on the 'official project list', the people known as active collaborators in affairs of the GWP. Those were the people who attended trainings, carried out field trials, implemented the technologies and also benefited first of all from the GWP. When my research partner explained to the project contact farmer that I really wanted to talk to some specific people I had selected from the village mapping, he told him that one of the women was crazy and the other was too old and frail to talk to us (see also 4.2.4). Upon my insistence I finally met both of the women and found both accusations untrue. It turned out that the contact farmer had excluded them from project benefits because they could not contribute enough labour to the community nursery. However, both of them were heads of households and therefore had difficulties in allocating free labour to communal activities.

Equally, in the area of CST2 women were presented to me as a group of 'female-headed households' during village mapping – otherwise women were not mentioned as potential respondents. They were even excluded from village mapping, Focus Group Discussions (FGDs) and the making of the seasonal calendar by the men who were our initial contact persons suggested by the DAs. To overcome this problem I interviewed women separately from men and I held FGDs with women only and with a female translator.

The disadvantage of working closely with national and regional research organisations is that you may lose flexibility and to some extent your independent status as an outsider, because in the eyes of the respondents you become 'one of *them*'. This was particularly noticeable in Galessa, where my partner organisation had been working for more than ten years. In the beginning it was hard to move beyond long speeches praising the work of the organisation. In Ambober, there was not much awareness about the research organisation that my research partner was working for. Researchers were usually perceived as 'someone from the government'. There the challenge was to avoid any linkage to political issues.

Working closely with partner organisations also restricted my flexibility. I was not free to negotiate my entrance to the community in my own way, but in fact there was no alternative

to the official route via the *woreda* and the *kebele*. Furthermore, I was dependent on the availability of my research partners to make a field visit, and as they were also working for their organisations, it was not always easy to find a time slot when both of us *and* the farmers were available. This sometimes required a lot of patience and understanding, and at times I wished I had worked with independent translators. However, it is very difficult to find translators that have both some knowledge of the topic and sufficient knowledge of English. Especially where the farmers spoke only Oromiffa it was a huge challenge. My attempt to find an alternative translator was time consuming, and in the end I realised that the good relations I had with my research partners and their in-depth knowledge of the subject matter and the area were more important. For example, one alternative translator I tried working with struggled to translate tree names and soil conservation measures correctly from Oromiffa to English, which led to considerable confusion. From my work with the other translator I was already familiar with the terms in Oromiffa and I was confused when he provided another translation of those terms in English. Farmers would for example differentiate indigenous junipers (*gatira*) and foreign junipers (*farendji gatira*) – the latter one was actually a cedar variety, however for farmers the word for juniper was synonymous with 'conifer' as the range of conifers was limited to those two trees. But my translator simply translated 'junipers' and omitted their differentiation.

The farmers appeared to like and trust the researchers I was working with, which I concluded from the way they were interacting with them compared to other outsiders. Working with translators however has risks – as my knowledge of Amharic was limited, and non-existent for Oromiffa, I could not be sure about the actual questions and answers. And in fact it turned out that there was some bias in the translations when I double-checked some of them with another translator after my field work. I tried to address this in considering the second translations, as well as in triangulation through FGDs and in asking Ethiopian friends and other colleagues whether they considered the information correct or not.

Among the methods I found the landscape ranking exercise to be the easiest and most relaxed one to use, while the interviews were sometimes difficult because they still created some kind of formal atmosphere, and the FGDs were the most difficult to employ effectively. The FGDs were easier with the farmers than they were with the scientists, who often were reluctant to have a discussion but simply waited for new questions to be posed to them. FGDs turned out to be more of a moderated group discussion rather than a proper focus group discussion, possibly because farmers and scientists alike did not fully understand the purpose of these

semi-structured exchanges. Originally I had also planned to focus on much narrower topics, but the experiences of the interviews had shown me that this would have confused the respondents. A broader topic gives the respondents more space to explore and to slowly move towards the point they want to make. This must be understood in the political and cultural context of Ethiopia. First, free expression of opinion is still uncommon especially in a relatively public space like the FGDs due to the long history of oppression the Ethiopian people have known. Second, one heritage of this history of oppression is distrust. Third, there was a mixture of different age groups and hierarchical relationships between the different participants. This inhibited the more junior and less experienced members of the group in their participation.

At the end of my research, as I could not finish one FGD in Woglo for personal reasons, it was then completed by my research partner. I first considered omitting the transcript from my analysis, but then I realised that my role during the other FGDs in the villages was actually not more than an observer. My language skills were not sufficient to lead the discussion, and direct translation would have been time consuming and extremely disruptive. The transcript also showed me that the questions were identical with the ones I had given to my partner. I therefore included it in the study. The same applies to the landscape rankings in Wojnie and Woglo and some in Galessa. The farmers received the photographs, ranked them in terms of their preferences (as like and dislike) and then gave reasons for their choices. The role of my research partners was to explain this, hand out the photographs and record their answers. I therefore decided to include these data, even though I was not present at the time.

2.2.5 ETHICS AND POSITIONALITY

From the beginning, the most challenging aspect in field research for me was the fact that as a white woman I may have raised some expectations in terms of aid in the villages. I may also have raised expectations among research partners of bringing more well-funded projects to their institutions. I always emphasised that neither was the purpose of my work, and I explained repeatedly that I would present these findings to the authorities in charge who should act upon the farmers' recommendations. After data analysis I also went back to both sites and presented and discussed the findings in multi-stakeholder workshops with the communities and the authorities, which was very much welcomed and appreciated by both farmers and government representatives.

One challenge I encountered in my research was that I was studying KEF projects as a former coordinator of the Commission. At the same time I became manager of another KEF-funded project that was attached to the previously mentioned FWF project that funded my PhD. I sometimes found this difficult, and I was afraid that these two identities within me would also create some bias. This fear was also connected to the multiple roles I had played in the lives of some of my counterparts. This may have been confusing for many of the people I knew there, and it may have raised different expectations. Some people were expecting support in getting a scholarship to study in Austria. Others were asking me how to access KEF funding. Others were thinking about joint research projects. All of this probably influenced the way people interacted with me, and also the way they responded during the interviews.

During field research in the villages my ability to cook internationally acceptable food and to adapt to local conditions quickly was a considerable bonus in persuading my research partners to stay in the field. In Galessa I had to share the hut with my male research partner, which made him feel uncomfortable for cultural reasons. It took a lot of effort to persuade my partner to stay there rather than going back to Ginchi on a 30 km gravel road through a steep forest area on a motorbike every day. However, as I was sad to hear much later, the fact that we were staying there led to a considerable amount of adverse gossip, and rumours about the nature of our relationship badly affecting my colleague's life.

In Ambober I had a separate room that I only had to share occasionally with a rat, which was a particular challenge for someone with a rodent phobia. This was also one of our difficulties in finding an alternative accommodation when the veterinary assistant moved away. Rat infestation is extremely high in the area. At night dozens of rats will emerge and noisily raid all accessible food reserves. This was a challenge I underestimated in the beginning of my field work, especially in Ambober.

In Gondar, I was often taken ill, which slowed my progress. In addition, the difficult accessibility of local transport was a big problem in the area. This could only be solved through the cooperation of the head of the Austrian Development Cooperation (ADC) program in Gondar, who enabled us to use ADC cars occasionally.

Sometimes I felt uncomfortable about data collection and the recording because of the politically sensitive nature of the context in which I was working. I instructed both research partners to delete all data and never pass anything on to anyone else. In all honesty, however,

I cannot guarantee that some information gathered for my study was not passed on to government authorities or others. I found it very difficult to protect my respondents in such an environment. Of course, I did not ask politically sensitive questions, but sometimes farmers would complain about particular DAs or the extension system in general, and I was afraid that this might be harmful for them if anyone found out. Thus, I always sought to be as scrupulous as possible with my data collection and management techniques and to maintain the anonymity of my sources wherever possible.

In this chapter I have highlighted the theoretical framework and the methodology for my research, as well as some critical reflections on the methods, ethics and positionality. The following chapters now present the empirical findings of the research, subdivided into Chapter 3 on the introduction of the approaches to the farmers, Chapter 4 on different ways of knowing, and Chapter 5 on representations and the packaging of science in the case studies.

3 FINDING SOLUTIONS

3.1 INTRODUCTION

The Highlands of Ethiopia cover 45% of Ethiopia's landmass and comprise 95% of the cropland and 70% of the livestock population (Mohamed and Abate 1995; CSO 1988 cited in Mekonnen 2007). About 88% of the human population are settled in the highlands at an average density of 64 persons/km^2 (Mekonnen 2007). Official estimates predict that high forests may have covered about 35–40% of the total area of Ethiopia (EIAR 2000). As already discussed there are alternative versions of the history of deforestation, especially in the Ethiopian Highlands (see section 1.4). Similar debates on numbers and facts exist regarding soil erosion: run-off rates and loss of soil are represented in reports without much contextual information and thus lead to sometimes exaggerated conclusions (see 1.4). While there certainly are serious issues regarding tree and soil management in the Ethiopian Highlands, the complexity of history, politics and landscapes tends to be underestimated and there is a tendency to use numbers to prescribe coercive measures in tree and soil management. A complex web of past and present interrelations of national and international politics, religion, struggles for regional identity, famine and resettlement, conflict and natural disasters (Young 1998) have led to a long list of myths and stories about the 'fate' of the highlands (see 1.4).

The scientists in the case studies[10] recounted similar narratives about the study areas when describing and justifying the case study projects. Most of them mourned the lack of trees and forests in the landscape and the 'destructive' farming practices leading to soil degradation and more environmental problems. I repeatedly came across the expression 'it is our job to develop solutions for the problems of the farmers' when talking to the scientists working in the case studies, and 'The scientists will help us in finding solutions for our problems' when talking to farmers who were involved in the projects of the case studies. These expressions reflect a common perception and self-identity of the role of scientists in cooperating with farmers in agricultural research and development projects.

The distribution of roles seems clear in the case studies: the farmers provide 'the case' and 'the problems', and the scientists provide 'the solutions'. In the project proposals there are already implicit visions of what the 'better future' for the farmers will be, and how to achieve

[10] A more detailed explanation about who those scientists are can be found in 3.2.3 and 3.3.3.

this. The imagination of the latter seems surprisingly straightforward.

> Livelihood impact: The project will improve food security through improved agricultural productivity. By providing wood resources and by reducing the costs for fertilizers, the project improves the income situation for local households. […] With improved landscape management, there will be improved conservation of biodiversity and other natural resources for sustainable development. On a short term and in fine scales, farmers will get immediate financial benefit from being part of the research or being hired in daily work during plot establishment, guiding during survey and from hire of draught animal for the researcher in remote areas. (AR project proposal 2008: 11-12)

Improving agricultural productivity, improving the income situation, sustainable development and immediate financial benefits are the pillars AR is building his argument on regarding the question 'what will be the benefit of the people'.

> Smallholder farmers in Ethiopia have lacked financial resources to purchase sufficient fertilizer to replace soil nutrients exported due to different nutrient outflow mechanisms. Similarly, feed supply to animals is always at deficit. Awareness creation will motivate farmers to utilize available indigenous species as alternative or supplimentary [sic] fodder and organic fertilizer sources. As a result, farmers can boost crop and animal production. They can also gain economic benefits from the sale of crop and animal products. In the long run, the project outcomes will contribute to import substitution such as inorganic fertilizers and food self sufficiency attempts of the country. (GR project proposal 2005: 7)

GR also mentions the price of fertiliser as an issue that his project will address by providing alternatives. Another issue is fodder for livestock. He also argues that the farmers will benefit economically, and food insecurity will be mitigated, because the organic fertilisers the project recommends will help to supplement inorganic ones and boost agricultural productivity. Thus the arguments of AR and GR were rather similar in this respect, in spite of the fact that their projects were quite different (3.2.3, 3.3.3.). This chapter provides more information about how the scientists were trying to find solutions for the perceived problems of the Ethiopian Highlands in the case studies in Galessa and Ambober, which are located in different parts of Ethiopia (see Figure 3.). An overview of the agro-ecology and social background of both case study sites is included in Appendix 2.

The case study in Galessa is based on the Integrated Watershed Management (IWM) approach, while the case study in Ambober is based on the concept of exclosures that is a part of many IWM interventions. Each section first explains the background of the case study, then the approach, and which narratives and assumptions the approach is based on. It then explains how it came to be applied in this specific case and finally critically reflects on its implementation.

Both case studies are labelled as 'research for development projects' and 'project partnerships' by the donor KEF, and both case studies are embedded in a wider network of smaller and larger research activities (see Figure 3.5 and Figure 3.9), doctoral studies and projects belonging to the two host research institutions, Holeta Agricultural Research Centre (HARC) in Galessa and the Amhara Region Agricultural Research Institute (ARARI) in Ambober (see 1.4.5). Unfortunately it was not possible to analyse all of them for this PhD study: I am therefore focusing primarily on the two KEF-funded projects.

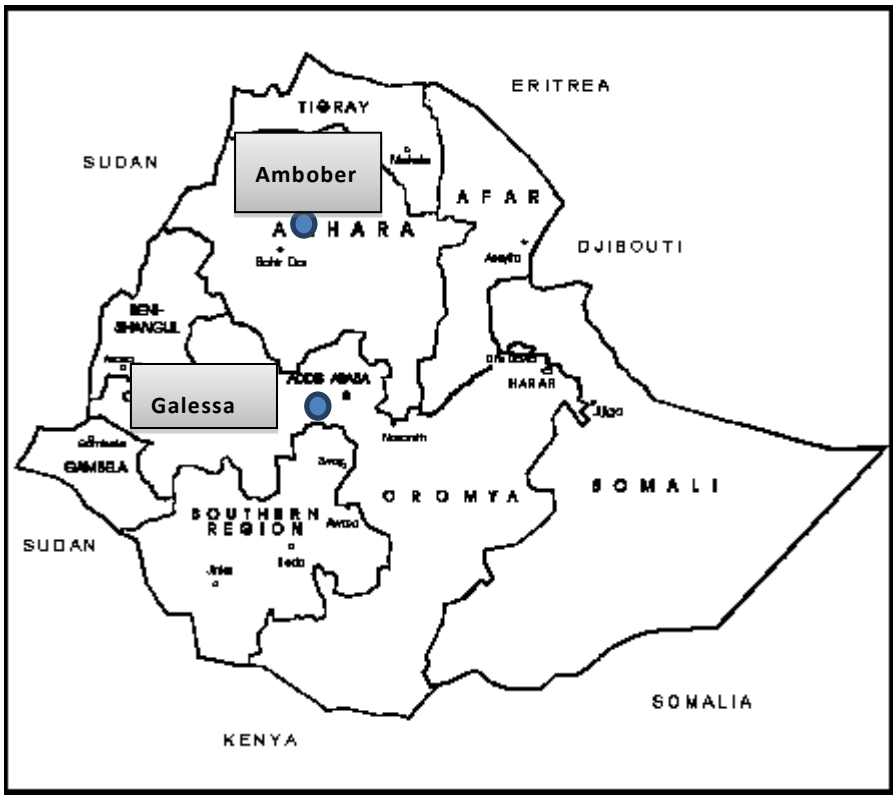

Figure 3.1: Map showing the location of the sites within Ethiopia.

(Source of Map: http://www.africa.upenn.edu/Hornet/strp039802.gif)

3.2 GALESSA: WATERSHED MANAGEMENT

3.2.1 GALESSA WATERSHED AND ITS PEOPLE

Galessa is located in Dendi District, West Shewa Zone (Figure 3.4). The specific area of this research is called Galessa Watershed. It is a high-altitude area of 2,900–3,200 m with bimodal rainfall patterns (Mekonnen 2007). Agriculture is the main source of income and agricultural production is dominantly barley, potato and enset (false banana), as well as cattle, sheep and horses (Mekonnen 2007). Galessa's landscape is characterised by gentle hills, small, seasonally waterlogged valleys and sloping fields in the actual catchment (Figure 3.2). The adjacent areas

of the watershed have steep declines of former forest areas leading down to riverine areas with remnant trees and shrubs that are difficult to access. There are very few and only small grazing patches left. Almost all of the land is used for crop production. Fallowing is still partly practiced but in decline. At present, trees and shrubs are mostly confined to homestead areas. There are exceptionally few remnant trees on farmland outside of the homestead, but an increasing number of eucalyptus plantations.

The majority of the people living in Galessa are Oromo. The main language is therefore Oromiffa, although some understand and speak Amharic as well. Oromo society in Galessa is patriarchal. Women, however, participate in decision-making processes at household and village level. They are active members of committees and research groups. On the other hand women of all age groups are subject to extremely hard physical labour; many widows and single women have difficulties to continue farming and making an income alone and are often looked down upon by other villagers, both male and female. Other marginalised groups are people of different ethnicity, and to some extent poor and landless farmers, although there is a huge variety between them. Some landless farmers are not poor, because they manage the land rented from others in very profitable ways. Other farmers may have land, but they may still be poor.

Figure 3.2: Agricultural landscape in Galessa, close to Tiru.

Figure 3.3: *Adbar* in Sombo, Galessa.

Social institutions play an important role, such as *idir* for funerals (sharing of cost for food and labour), or *debo* (shared work during harvest time), and *jarsuma* (the council of the elders that resolves conflicts). There are more than ten active social institutions known in Galessa (Admassu et al. 2008a).

Currently only a few people are migrating to the area from outside. Most people living in and around the watershed originate from the same families and are related. The area seems densely populated with each of the villages having at least 25 to 30 households. Elderly people

remember a time when one village had only five households and settlement was sparse. In the case of Tiru, even the younger farmers remember the first settlers, two brothers, who came to this area in the imperial time. The villages therefore now mostly comprise related families, but they also have ties to neighbouring villages through marriage. The settlements are organised in *got* (villages) with clusters of houses indicating closely related households.

Trees and shrubs provide a variety of social services to the local communities in the study area (Mekonnen, Glatzel and Sieghardt 2009). These are often linked with local customs, social values and institutions: thus for example remnant indigenous tree species can be found around sacred sites, churches or places of worship and meetings called *adbar* (Figure 3.3)[11]. The role of *adbar* is explained in Bevan and Pankhurst (1995: 17):

> In Dinki and other sites around people also practice traditional beliefs like spirit possession cults and adbar (a guardian spirit mostly represented by a tree). People also practice certain group rituals around adbar. Spirit possession cults are an important part of the cultural fabric of Northern Shewa and play a considerable role in conflict resolution.

Baxter, Iultin and Triulzi (1996:211) claim that praying and offering sacrifices 'to the *adbar* spirits is not directly related to the traditional Oromo religion but integrated with the importance of trees in Oromo mythology'. Some authors claim that the importance of trees in Oromo mythology is reflected in the use of the sycamore tree (*oda* in Oromiffa) in the national flag:

> Traditionally the Oromo believed Oda to be most sacred of trees, the shade of which was the source of peace, the centre of religion, and the office of government – the meeting group for the democratically elected *gada* leaders. (Holcomb (1991:4) in Jalata (1998:198))
>
> Attachment to the land can be seen in the key symbols of Oromo nationalism. The OLF flag, for example, depicts an *oda* tree; in the past Oromos regarded certain trees as sacred and such trees also figured as meeting places for political and religious gatherings. (Knuttson 1967 in Jalata 1998:237)
>
> Therefore, we are able to read the selection of the *oda* tree as a symbol of national identity with physical features of the territory while also invoking an appeal to tradition, understood in terms of a valid past and in relation to the particularities of Oromo culture. (Jalata 1998:237)

The role of trees in Oromo culture and religion is sometimes simplified as 'Oromo believe in the power of trees, their God is a tree', a rumour I heard repeatedly during my time of study in Ethiopia. However, the relation between humans and the environment in traditional Oromo

[11] I will elaborate in more detail about the role of religion and spirituality among the Oromo people in 4.2.2.1. Here I provide some background that is needed to understand the case study.

life is much more complex than that. This is also obvious in Megerssa's (2005) explanations about the Oromo World view.

> For the Oromo this totality of nature can be defined as that which is appropriate to the living being in question. Given the diversity of nature, what is appropriate for one living being or creature may not necessarily be for others. […] For it is the totality of Nature that provides the norm: it defines the nature of plants, animals and human beings. It is thus only by conforming to this norm that they can attain their individual destinies. (Megerssa 2005:76)

Adbar are thus important spiritual and cultural places, but the Oromo do not believe that the trees of *adbar* themselves are spiritual deities as is sometimes assumed in other parts of Ethiopia. In fact wood in itself is an important material for the Oromo – the complexity of the values and attributes they assign to different wood types is explained by Kassam and Megerssa (1996:154):

> A number of other cultural, religious, and historical criteria also come into play. Plants in general occupy a predominant place in the thought-world of the Oromo and belong to a highly conceptualized domain of their culture. Plants figure in all aspects of Oromo life. The significance attached to particular trees in the Oromo system of thought therefore predetermines part of the meaning of the objects fashioned from them. An object is not made only for its functional value, it is also made to situate man in cultural time and space and to enable him to communicate with the forces which flow through the life-giving trees of his land.

Thus, for example, when making sticks different types of trees are used with some given more preference over others – and different wood is used for making sticks for different purposes (Kassam and Megerssa 1996). An example of the complex relation between humans and the environment is described by Dahl and Megerssa (1990): they explain the meaning of water to the Boran Oromo. The Boran people have a sophisticated system of well organization that 'forms a framework for the expression of basic cultural principles of solidarity and respect' (Dahl and Megersa 1990:22-23). The wells are linked to ideas about fertility and descent, and the basic concepts of Boran identity (Dahl and Megersa 1990).

> The Boran view of cosmology, ecology and ontology is one of a flow of life emanating from God. For them, the benignancy of divinity is expressed in rain and other conditions necessary for pastoralism. The stream of life flows through the sprouting grass and the mineral waters of the wells, into the fecund wombs and generous udders of the cows. […] one can select almost any item and see it as symbolizing the whole chain of fertility: the fat cattle, the dung, the grass, the milk and so on. All these items can be seen as "key" symbols in the sense that each of them provides a clue to the essential values and concerns of the Borana. (Dahl and Megerssa 1990:25)

According to some of the farmers I interviewed, the Oromo in Galessa are related to the Boran

Oromo. They made a connection to the Boran Oromo when talking about the Qallu: the spiritual leaders of the past.The Qallu played an essential part in the politico-religious setting of the Oromo: the Qallu symbolises a person of 'divine' descent that legitimates the entire *gadaa* cyclical process (Kassam 1999). Nowadays these so-called Qallu leaders (Levine 1974: 131) play a smaller but still significant role in Galessa. In Galessa, Qallu culture is still actively maintained, and *adbar* sites exist in every village. But there seems ambiguity about the importance of those – celebrations at *adbar* sites take place at least twice a year at different times in each village, predominantly before and after the main rainy season (*kraemt*). Qallus invite neighbours for ceremonies on a more regular basis. Yet, the importance of those traditions for individuals range from 'outdated', 'non-Christian' to being very important traditions passed on by forefathers that have to be maintained. But the reasons for this importance are kept secret.

Adjacent to the watershed there used to be a substantial forest area extending from Chilimo Forest (Figure 1.1) that is now about eight km away from Galessa. Chilimo Forest is a large natural forest area under state protection and more recently under participatory forest management. However, most of the forest areas in the vicinity of the watershed, and scattered trees on farms in the village areas, were reportedly cut down during the transition periods from the imperial regime to the Derg, and from the Derg to the present government. Nowadays, those steep hills previously covered with forest are still sparsely forested, and cultivation for crops in those areas has led to serious soil erosion. The land is so steep that most of it can only be cultivated by the use of the hoe; ploughing is no longer possible.

3.2.2 THE SOCIAL WORLD OF THE SCIENTIST

GR was the main scientist in this case study. He was born in North-West Gondar in Amhara Region, and Amharic is also his first language. He grew up in a small village, but when he started going to school he moved to a small town. His father was a business man, but he also had some land and dairy farm in the village, so he was doing both agriculture and a small business. For his education he did his first degree in plant sciences in Ethiopia because he was very good in biology in high school. He was interested in plants because the life in the countryside depended mostly on plants, and they were an important part of life.

After his degree he joined the Ethiopian Institute for Agricultural Research (EIAR) which is the federal agricultural research institute. After working on agroforestry issues for five years he went to Kenya for his MPhil in forestry and agroforestry. There he was also attached to the World Agroforestry Centre for field research and laboratory facilities. In Ethiopia he continued

working for EIAR and also started working in Galessa. Later on he went to Austria for four years to do his doctorate in forest ecology and natural resource management at BOKU University. His choice for BOKU was influenced by the reputation of Austria's high forest cover, environmental protection efforts - and the availability of a scholarship. After his return he worked for EIAR again, and coordinated the African Highland Initiative (AHI) programme that was also working in Galessa.

GR is married, has three sons and lives in Addis Ababa. He is a sportsman and enjoys running in early morning hours. At the time of this study he was still working for EIAR, at HARC. His workplace Holeta was outside of Addis Ababa and he had to commute to work every day with a service bus. At HARC he had a small office, and a team working with him on the AHI programme. He had a very friendly relation with his team members and was keen to continue his research career. However, the administrational burden put on him after his return from Austria did not make him happy in his job, even though he was very committed to his institution and the work he had been doing there. Further constraints were the lack of research funds, research infrastructure (access to journals, libraries, internet facilities) and the lack of transportation to go to the field. So it was not surprising to me that sometime after I started my research he moved from EIAR to the International Livestock Research Institute (ILRI) with the wish to do a sabbatical there as a visiting scientist. This was however denied to him, and he was given two choices: either to return to EIAR or leave the institution for good and pay a fine for his early departure. He decided for the latter. He was also trying to continue his cooperation with BOKU – but after the retirement of his supervisor it was difficult for him to find a new partner there, and the connection started to fade. He is however a very committed scientist, who has published a lot about his work, particularly his doctorate, and is also willing to share his knowledge with others. In spite of his strong natural science background he is open to social issues and expressed interest to continue working closely with farmers. Research without practical application does not give him any satisfaction in his work.

3.2.3 PROJECT DESCRIPTION: GALESSA WATERSHED PROJECT

CST1 has been the site of one larger, internationally funded research for development project as well as some smaller research activities and MSc and PhD/doctoral studies. The beginning of the watershed project was in the 1990s when HARC was mandated to work in Galessa to study a model watershed site for the Highland areas. Soon after that, ten years of research cooperation with the African Highland Initiative (AHI) started. AHI and HARC selected Galessa as a site for their research activities. This was to be the largest project that took place in

Galessa and it was called the Integrated Natural Resources Management (INRM) project. It was implemented in four phases by HARC, EIAR, AHI, Dendi Woreda Office of Agriculture and Rural Development (WOARD) and farmers from 1997 until 2007 (for more details see 3.2.5). Furthermore, BOKU was involved through the supervision of GR, and a small project that enabled GR to do some additional research in Galessa Watershed and three other *kebeles* from 2005 until 2007 – this was the KEF-funded project that I wanted to focus on in my thesis. GR was the project manager of this project, but he was also the project coordinator of the INRM site at Galessa before his studies. Therefore it was sometimes difficult to separate his activities for the different projects in the analysis for my thesis. During the interviews with farmers involved in the GWP it turned out that they were not differentiating between the different projects, rather they subsumed all the above mentioned projects and research activities that were related to HARC under the term 'watershed project'.

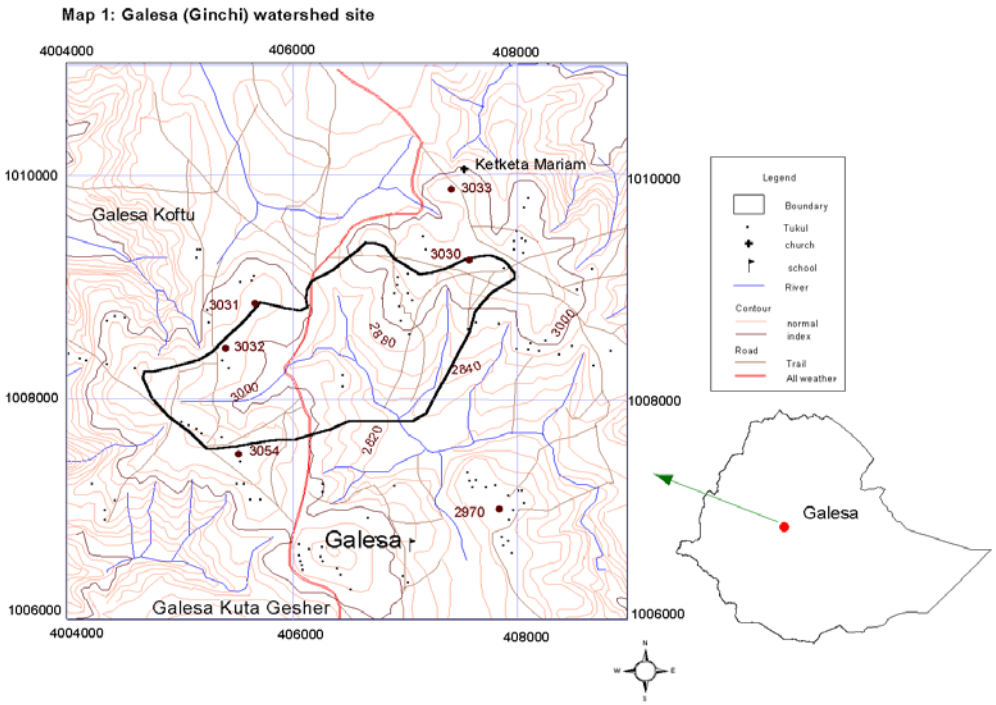

Figure 3.4: Map of Galessa Watershed (produced by Demeke Niguse, HARC). The name of the *kebele* is Galessa Koftu, but the watershed area is often referred to as Galessa Watershed alone.

The actors the GWP had to interact with were the staff members of the Woreda Bureau of Agriculture and Rural Development (WOARD) in Ginchi; the DAs in Galessa Koftu; the Peasant Association (PA) Chairman; the watershed population, and among them the local project

coordinator, the local contact farmer, and the village contact farmers. All of those were primarily men, only among the village contact farmers there were some female farmers. The farmers who were enrolled as *users* in the GWP were farmers owning land inside the watershed. Among those farmers, the project worked primarily with a selected group of people (see below and 3.2.6).

Different scientists worked for the different projects in CST1 at different times, and staff fluctuation was high. In connection to CST1 I interviewed three scientists at HARC who were working for the INRM project at different times, the forestry director at EIAR, two forest researchers at the Forest Research Centre (FRC) (another sub-organisation of EIAR), and three BOKU researchers involved in the supervision of GR's doctoral thesis. However, these scientists and the farmers I interviewed often referred to 'the scientists' in their statements, subsuming all scientists who had worked at different times within CST1 under this term. These were scientists working for HARC, FRC and AHI. The majority of them were working for HARC. According to the names mentioned by both farmers and scientists whom I interviewed there were at least 10 different scientists working for CST1 over the years.

The topic of the KEF project was the impact of selected indigenous and exotic tree and shrub species on soil fertility improvement and fodder production (GWP KEF proposal 2004). The project enabled GR to expand his research and include a wider survey than originally planned. His studies were carried out following the participatory research activities and household surveys done by the AHI project. The project script is only partly documented in the project proposal submitted to KEF because the script originated in the time before the KEF project and continued until the INRM project was concluded in 2007 (see 3.2.5). Unfortunately I could not obtain detailed information about the INRM project proposals to IDRC, the Canadian donor. These proposals would also have covered a larger geographical area because the INRM project had different sites all over East Africa. However, there is a range of reports and publications available that document the INRM project and its outcomes more specifically for the site in Galessa[12]. According to GWP publication (2008a) the third phase of the INRM project from 2002 to 2004 was most relevant in terms of enrolment of farmers and in the design of their roles as users in the script of the INRM project.

[12] In order to safeguard a minimum level of confidentiality I do not quote these reports and papers by their titles and the names of the authors. If these documents are mentioned in direct relation to the case study, they will be called 'GWP publication', or 'EP publication'.

> AHI concentrated in selected watersheds focussing on development approaches and Intergrated Natural Resources Management (INRM). In the third phase, social issues and process documentation received much attention. The approaches in phase three were highly participatory and interdisciplinary. (GWP publication 2008a:2).

This script continued in the fourth phase (2005-2007):

> The focuses of the fourth phase were scaling up of technologies and knowledge, institutionalizing the concepts of integrated watershed management and strengthening of local institutions and bylaws. Leaflets, posters, discussion forums, publications, web sites, trainings and cross site visits were the most important tools to achieve the scaling out and up efforts. (GWP publication 2008a:2).

In the first two phases the project was looking at income creation through land use diversification and intensification; soil conservation and fertility maintenance and improvement; integrated pest management (GWP publication 2008a). There was more emphasis on the biophysical rather than the social. I have written in more detail about the activities of the project relevant for my study in 3.2.5. The narrative documented in the reports on the INRM project describes the project areas as areas that are 'densely populated, have poor or declining natural resource endowments and, due to unsuitable management practices and limited levels of investment, have reached the point where people and landscapes can no longer provide livelihood needs.' (GWP publication 2008a:1-2). GWP publication (2008b:10) describes the reasons to select the INRM approach as follows:

> The fragmented landholding (3-5 parcels) coupled with the improper landuse system, nutrient depletion, drought and drainage problem, low crop and livestock productivity worsen the situation. Deforestation for cultivation, wood for fuel and construction, overgrazing, conversion of marginal lands to agriculture is escalating the problem of soil erosion and land degradation than ever. Although substantial efforts have been made to halt the problem, the achievements are far below satisfactory.

This narrative is in line with common narratives about land degradation in Ethiopia as discussed in 1.4.4. As a solution to the problems laid out in the narrative, the project characterised farming systems, identified and prioritised the major problems (see 3.2.5), and developed intervention plans: it developed technical solutions such as introducing new potato and barley varieties, new multipurpose tree species, leguminous shrubs, soil conservation constructions, and many others (GWP publication 2008a). In addition to that it developed training for capacity building, organised cross-site visits, field days and workshops for researchers, development agents, farmers and other stakeholders (GWP publication 2008a). The purpose of these capacity building activities was that they 'built thrust [sic!] between farmers and researchers; created awareness and demand on crop, livestock, NRM related

technologies; and improved farmers' knowledge on locally available resources.' (GWP publication 2008a:5).

The shift to an interdisciplinary and participatory approach (phase three of INRM) occurred because a new staff member from AHI contributed new ideas to the project and introduced Participatory Integrated Watershed Management (PIWM) to the project. This lead to the integration of different disciplines and the involvement of farmers in 'problem identification, priority setting, planning and implementation' (GWP publication 2008b:11).

> Initially, I was a member because I am representing forestry. Then finally I was a core team member when the new approach was coming with NN, she was the leader, our leader, and she is coming, and then we have tried to identify the watershed area. And that watershed area, we identified villages. And different researchers we have tried to separate what are the priority problems of different villages in that watershed. (E-Scientist, interview, 2.11.2009)

He explained that this new scientist brought 'the new approach' that he later described as more interdisciplinary and holistic than before. It was thus the arrival of the new staff member that changed the approach of the project. Other INRM scientists reported that this approach was not accepted immediately, but it gained more support gradually. The above mentioned problem identification process and the subsequent ranking was mentioned repeatedly by the scientists during interviews (see also 3.2.6 for more details), who considered the way this was done a novel approach that changed their ways of working with the farmers in Galessa.

The approach was also used by the KEF project in an adapted form. The KEF proposal explains the research plan of GR. He had access to the data and experiences made in the GWP, and he used the opportunity of the KEF project to make an in-depth study for his doctoral thesis. Among the six objectives, three are only addressing bio-physical issues, and the three others are addressing both bio-physical and knowledge issues. The first objective looks at the identification and prioritisation of tree and shrub species that are useful for fodder production and soil fertility improvement (GWP KEF proposal 2004:4):

> […] Informal surveys will be conducted to gather qualitative information about tree and shrub species that are useful for soil fertility improvement and fodder production. Group and individual discussions will be held to identify and list farmers preferred fodder and soil improving tree and shrub species. […] Evaluation criteria, management, propagation, seasonality, compatibility, attempts for restoration and hindrances for expansion of indigenous fodder and soil improving tree and shrub species will be studied through discussions with farmers and key-informants. Various farmers' evaluation criteria for fodder and soil improving tree and shrub species will be ranked through pairwise ranking

> technique. Top ranked criteria will be used for prioritizing fodder and soil improving tree and shrub species. […]
>
> A formal survey will be carried out for quantifying and verifying the informal survey findings on fodder and soil improving tree and shrub species. Farmers that own livestock and land for crop production will be given more consideration for the formal survey. A total of 150 farmers will be identified […].

He combined a qualitative and a quantitative approach. He aimed at documenting farmers' knowledge about some specific aspects of trees and shrubs and wanted to combine this with the findings from his bio-physical experiments. He also wanted to know which trees and shrubs were prioritised as fodder and soil improving species. The role assigned to the users therefore comprised provision of knowledge to GR as a scientist. They were enrolled in 'participatory' research in order to provide information to the designer (GR) who would use this information to design his bio-physical experiments and to interpret his findings. Finally he wanted to ascertain his findings by adding a questionnaire-based quantitative survey with 150 farmers. By focussing only on livestock owning farmers and landowners he risked introducing a bias towards selection of the wealthier segments of the society (as I describe in 3.2.6 and 3.2.7 the GWP liaised mainly with a group of farmers that was preselected by the villages; later on these spokespersons of the villages achieved a powerful status in terms of access to knowledge and control over dissemination of knowledge). In some cases this lead to conflict and undermined trust in the project (see 3.2.6). This problem was also related to objective number five of GR's proposal to KEF. It aimed at developing dissemination strategies for indigenous fodder and soil improving tree and shrub species (GWP KEF proposal 2004:5):

> Literature review and Participatory Rural Appraisal (PRA) approaches will be employed to collect key information for the development of dissemination strategies. Interview will be held to identify potential partners that will have a stake in disseminating fodder and soil improving tree species. Awareness creation avenues that exist in the project area and can play a role for tree species popularization will be explored. […] Focal groups discussion will be conducted to assess community based local institutions […] Finally, dissemination guidelines will be produced and made available to the users or implementers.

In this objective he made a clear linkage to the on-going research in the area, without specifically mentioning the INRM project. He also designed another role for farmers as users: beyond provision of knowledge they were also involved in awareness creation and dissemination: the term 'awareness' occurred several times in his proposal. Therefore it was not surprising that the final objective then aimed at enhancing 'awareness of farmers, development agents and scientific communities on indigenous fodder and soil improving tree species' (GWP KEF proposal 2004:6):

> Theoretical and practical training will be organized for farmers and local development agents. Means of improving soil productivity; sources and status of animal feeds; identification of indigenous fodder and soil improving tree species in the project area; and seed collection, propagation, planting, management and utilization of fodder and soil improving tree species will be covered during the theoretical training sessions. Farmers will practically observe and evaluate fodder and soil improving tree species that exist in the project area. Handouts will be prepared and provided to farmers and development agents. A total of 30 farmers and development agents will participate in the theoretical and practical training program. The training will involve women and men farmers that are from different social categories. […]

In this final objective GR has designed another role for farmers involved in his project (although he did not specify how he selected them): the farmers would be trained with a range of technologies (e.g. seed collection, propagation, planting.). As it turned out later therewere already many farmers in the area who were well familiar with these technologies based on their own experimentation or knowledge, however this was not known to GR at this point (see 3.2.7). Thus the training would be provided by outsiders (either scientists or extensionists), not the farmers themselves. Their role was to receive knowledge and then implement it. In the logframe of GR's KEF project it was also stated what the farmers were expected to do with this knowledge. As purpose, GR stated 'Utilize promising indigenous tree and shrub species as sources of organic fertilizer and fodder for animals', and the indicators of achievement would be 'More than 500 farmers practiced farming with organic resources, and expanded planting and feeding three indigenous fodder tree species in Galessa-Jeldu areas by the end of the year 2010.' (GWP KEF proposal 2004). Under outcomes GR explained what the project wanted to achieve with this:

> Supporting local knowledge of farmers with biological findings, broadening their skill through trainings and empowering them to express their needs are some of the issues that can be considered as an added values to farmers. The outputs will be transferred to the beneficiaries through organized training forums, bulletins and other publications. Moreover, strong linkages with local office of agriculture and natural resources management, non-governmental organizations and research centers will be forged to help in scaling up outputs of the project. (GWP KEF proposal 2004).

What the proposal characterised as 'awareness raising' was thus not only limited to farmers, but reached out to a number of other actors. This also made sense as this project was not a stand-alone research activity. Figure 3.5 shows how the KEF project was embedded in a network of different project activities in the area that can also support the idea of dissemination expressed by GR. It also shows which activities have ended, and which ones are still continuing (arrows pointing further). It demonstrates the complex organisational environment of the KEF project – a complexity that most farmers are oblivious to. The

delineations between the different projects carried out by HARC with partners are not as strict as they appear on this diagram, as different actors were participating in the same projects. GR, for example, participated in the INRM project, the KEF project and his doctoral study, and he was also involved in the national watershed management activities.

CST1 is connected to the research strategy of EIAR, because the site, Galessa, is a research mandate area of HARC (that is a sub-centre of EIAR). Therefore there are occasionally studies or smaller projects taking place there, that are part of this research mandate. CST1 is also connected to the research of the African Highland Initiative (AHI) – it is often presented as an example of a new approach of farmer-scientist cooperation in publications or workshop presentations in Ethiopia.

Thus the research done in CST1 is quite well known among the community of natural resource management researchers in Ethiopia. The relation to the NGO sector on the other hand was stronger when CST1 started – FARM Africa was undertaking a larger project on participatory forest management in Chilimo Forest then and according to GR there was some exchange between HARC staff members and FARM Africa then. The other ongoing NGO activities in the area are taking place independently of the research activities.

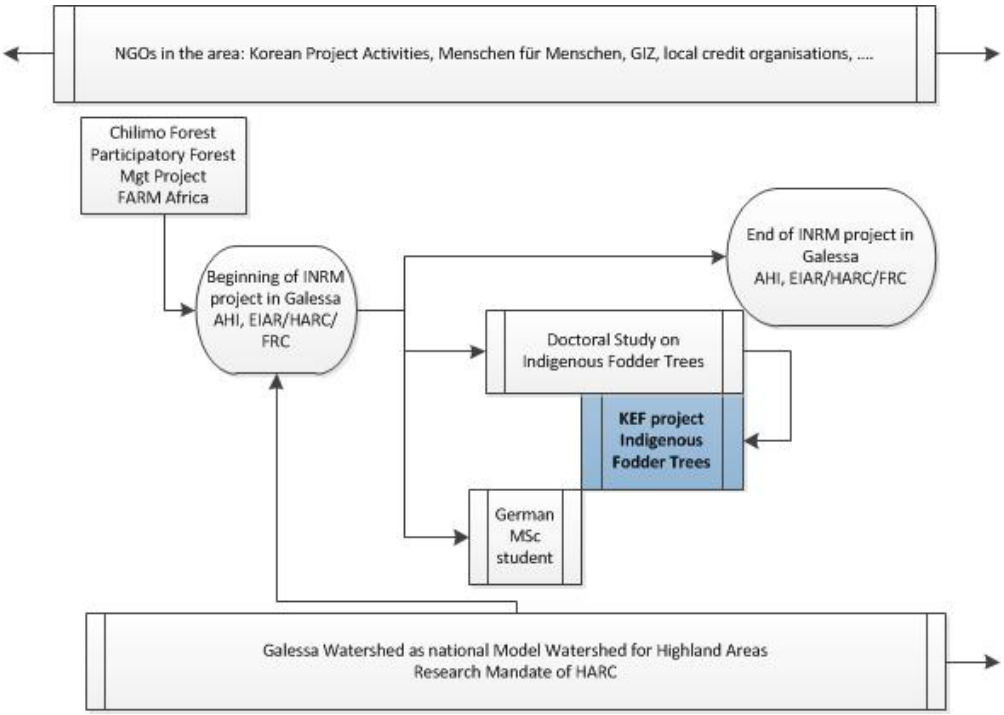

Figure 3.5: Case study 1, Galessa, network of project activities. Starting on the left in the 1990s.

3.2.4 ORIGINS AND CONTEXT OF INTEGRATED WATERSHED MANAGEMENT

Watersheds have become the centre of attention due to global discussions of water shortage and land degradation (German, Kidane and Mekonnen 2005). However, the origins of watershed management go back to colonial times both in Africa and India. Soil erosion according to Shah (1998) was identified in the 1870s: in India the colonial administration started raising the issue early, and afforestation was seen as a means to combat erosion. However, the link between soil erosion and 'wrong' farming practices in Africa was only made after the 'Dust Bowl' in the USA in the 1930s (Shah 1998).

In African countries under colonial rule a system of coercion and control was applied – on the one hand, there were massive soil conservation campaigns, educative campaigns for farmers, and technical fine-tuning for local conditions, but, on the other hand, farmers were fined for not keeping to the prescribed methods, there were bans on tree logging, restrictions on land use, and resettlement (Shah 1998). The same was repeated in Ethiopia under the rule of the Derg regime in the 1970s and 1980s (Admassie 1995).

Integrated Water Resource Management (IWRM) emerged in the 1930s in the USA (Stålnacke and Gooch 2010). IWRM is a concept that addresses the value as water of a resource, and the role of people in managing this resource (Stålnacke and Gooch 2010). IWRM also recognises the importance of legislative and policy structures and it is well connected to international policy frameworks (Stålnacke and Gooch 2010), such as the MDGs, the Global Water Partnership and the Water Framework Directive (EC 2000). Thus IWRM operates on multilevel governance issues, and at a global level, while IWM is more oriented on country-level processes. The idea of IWM is to draw the emphasis away from the farm level only, and at the same time also to look at other components and other actors at different levels (German et al. 2005). German et al. (2005) list among others Participatory Watershed Management (PWM), Integrated Natural Resource Management and collective action. These approaches have some common aims such as 'to enhance the benefits of "ecosystem services" of upper catchments to downstream and urban residents, and manage flows to optimise use among multiple users' (CGIAR 2002 cited in German et al. 2005: 1). However, both IWM and IWRM have been criticised for a lack of clear methodologies, and for being unclear about what would be required to successfully implement the approaches (Lenton and Muller 2010).

> Watershed is defined as a delineated area with a well-defined topographic boundary and water outlet. A watershed is a geographic region within which hydrological conditions are

> such that water becomes concentrated within a particular location […] watershed comprises a complex of soils, landforms, vegetation, and land uses. (Lal 2000: 5)

The rationale for watershed management refers to the fact that a watershed is a basic hydrologic unit; hence Lal concludes that 'issues related to sustainable management of natural resources […] are addressed within the context of watershed management' (Lal 2000: 5). For people living inside the watershed, this geographic–technical delineation may not necessarily make a lot of sense. Tiffen and Gichuki (2000) describe how the watershed itself represents properties that may belong to farmers, other landowners (from outside) or the state. The farmers are aware of water flows and effects of upstream land management on their land. Even though the watershed is 'not a social unit' (Tiffen and Gichuki 2000: 306), social issues are theoretically relevant for IWM, and often addressed as part of participatory approaches (Rhoades 2000). However, the inherent systemic, trans- and interdisciplinary natures of PWM and IWM are challenging. It impinges on disciplinary, social, bureaucratic and political issues, making simple, straightforward solutions hard to find. Implementation of IWM has many pitfalls (Rhoades 2000; Blomquist and Schlager 2005). Yet IWM is also specifically mentioned in the Growth and Transformation Plan (MOFED 2010): more efforts will be put into watershed management. It is thus also strategically important in the current policy context of Ethiopia.

The underlying theory in Ethiopia is that protecting a watershed by increasing tree cover and by putting soil conservation measures in place will lead to more sustainable land use and a decrease in soil loss, which will eventually also improve agricultural productivity and livelihoods and contribute to the country's overall development. However, one of the challenges of the approach is that different disciplines have different stakes in IWM, and in Ethiopia interdisciplinarity is a relatively new concept in practice. So while, for example, agronomists may be interested in scaling out of technologies, others may be more interested in the aspects of environmental services, conservation, improvement of livelihoods, equity and collective action; but all those may be represented by different experts who are not necessarily working towards a common goal (German, Mansoor, Alemu, Mazengia, Amede and Stroud 2007).

In Ethiopia, the concept of watershed management also builds on the earlier policy focus on soil and water conservation (SWC) measures – especially as developed in northern Ethiopia. One scientist emphasised that during the Derg regime the first official research organisations in Ethiopia were established, and he claimed that in the beginning there was a lot of emphasis

on soil research by the government. According to him, this emphasis originated in the early 1980s in the recommendations of Prof. Hans Hurni, whose soil conservation technologies were applied widely in the northern parts of Ethiopia at the time. However, he also mentions that the initiative was then politicised by the Derg and rejected by the farmers (E-Scientist, Interview, 3.11.2009).

The latter is also confirmed by Admassie (1995) who reports on the failure of the Food for Work (FFW) Programme to achieve sustainable results: already in the 1970s (and earlier, see Chapter 1) environmental degradation was blamed on farmers, specifically as a consequence of 'deforestation and de-vegetation of hillsides in quest of fuelwood or due to land being ploughed without appropriate conservation measures' (Admassie 1995: xxii). In 1972/73 the FFW took root in Ethiopia, but because of drought and famine in the first years of the Derg the government pushed the programme towards 'speedy achievements, to the detriment of long-term impact and sustainability' (Admassie 1995: xxiii). Terraces were built, trees were planted and other soil and water conservation measures were implemented with the labour of the local farmers who were compensated with either food or money. However, those constructions had a short lifespan.

The situation is comparable nowadays: the Productive Safety Network Programme (PSNP) is following a similar concept and is facing similar problems. The PSNP delivers cash and/or food transfers to 7-8 million rural Ethiopians for six months every year, either through public works (85%) or for free as direct support (15%). There are reports that farmers are dismantling physical works, only to rebuild them the following year and to be paid another time. I have also been told that the farmers feel pressurised by the government to do this work to enable government workers' to complete their statistical reports - rather than for their own benefit. Farmers in both study areas told me that they had already built terraces during the Derg, but then everything was dismantled again for different reasons. Some farmers were worried about rat infestation; others were concerned that the terraces were taking too much space. But when the projects and the government started paying them again for building terraces, they would do so obligingly. Similar findings have been reported by other authors (see, e.g. Dessie, Wurzinger and Hauser 2012; Tesfaye 2012).

IWM has a strong focus on the core issues of land use and environmental degradation in

Ethiopia; thus it must be seen in the context of the debates around those narratives and paradigms. Many studies carried out by Ethiopian researchers point to the fact that land degradation is a serious problem in the Ethiopian Highlands (see also section 1.4). The arguments often refer to common narratives of environmental degradation. Hoben (1996) explained how neo-Malthusian and other related narratives have persisted for several decades in Ethiopia and that they were likely to continue to influence environmental policy-making there. Moreover, he asserted that these narratives mostly originated from outside interventions of donor experts. Hence, they tended to result from political, strategic or moral pressure to develop quick solutions for urgent problems such as the 1985 famine, as well as from a lack of research illuminating the regional context in Ethiopia.

3.2.5 APPLICATION OF IWM IN GALESSA

The debates outlined above led me to question what prerequisites might be necessary for IWM to become a suitable concept for the Ethiopian Highlands. The INRM report says the following about Galessa:

> Integrated watershed management (IWM) is a process of formulating and carrying out a course of action to managing human activities in an area defined by watershed boundaries in order to protect and rehabilitate land and water, and associated aquatic and terrestrial resources, while recognizing the benefits of orderly growth and development. (GWP publication 2008b: 9)

Thus it is an ambitious approach and also rather unspecific. Nevertheless, it became increasingly popular in Ethiopia over the last ten years. This popularity, however, excludes a serious public debate about the failures of previous, similar approaches for SWC during the Derg regime. The official starting point for IWM in Ethiopia was the visit of a delegation of Ethiopian government officials to India and China to learn about different development interventions. It was this visit in the early 1990s that led to the adoption of the watershed management approach as an important policy framework for interventions on a landscape level to combat soil erosion and land degradation (E-Scientist, Interview, Ethiopian Researcher, national IWM expert, 9.2.2010).

To implement the watershed management approach on a national level in Ethiopia, a conference was organised in Woldeya, Amhara Region, in the 1990s, which called major national stakeholders together to discuss the issue. Following the conference a committee was set up to develop a strategy for implementation and to identify sites representative for the country's major agro-ecological zones. In the process, Galessa was selected as representative

of the highland and high rainfall areas (Interview, E-Scientist, 9.2.2010).

In GWP publication (2008b: 12), the criteria for selecting the different sites were listed as

> agro-ecological representation, prevalence of resource management and land degradation problems, distinct outlet and hydrologic boundary. The team also considered that the watershed falls within the same social and administrative boundary, diversity in the current and potential land-use systems, presence of inhabitants within the watershed, absence of intensive interventions by other government and NGOs. The size should also be large enough to accommodate potential challenges and small enough to be manageable with the existing resources and measure the impacts. The watershed should not be far from the implementing research center and all weather roads.

Galessa is only two hours from Addis Ababa, and one hour from Holeta, where HARC is located, and it is easily accessible by a well-maintained all-weather road, which is also the connection between the towns of Ginchi and Jeldu, and Chilimo Forest is nearby. After the selection the mandate for implementation was given to HARC (GWP publication 2008c). At the time when the sites were already selected, and work was starting in the watershed sites, the AHI came in and was looking for cooperation opportunities for a project on integrated natural resource management.

AHI wanted to develop methodologies and bring technologies from the research centres to the farmers, and it was also working on a watershed level, so there was a common interest. Like the Ministry of Agriculture, the AHI was also looking for a model site for potential upscaling; therefore the site needed to be representative, and the findings applicable in other areas later on. So the problem of soil erosion and land degradation was not seen as unique or special to Galessa; rather it was seen as a 'typical case' for a cold highland area with a mixed farming system. One of the scientists working for the GWP described how the interests of AHI and the Ministry of Agriculture came together:

> And then when the Ministry of Agriculture was trying to do some work, AHI was reforming itself, and they were focusing on integrated natural resources management, and their programme was fitting to our programme, so we were handling the watershed together. We were working together on Galessa watershed. And the interest of AHI was to develop methodologies, and EIAR was as a research organisation, it has many technologies, so it wanted us to verify, test the technologies in the watershed. So I think it was a very good arrangement. (E-Scientist, interview, 9.2.2010)

The Ministry of Agriculture had already decided to select watersheds for research, so it was convenient that AHI had a similar interest. Integrated natural resources management fit well to

the idea of watershed management. Also the interests of AHI and EIAR met in this project, as one (AHI) wanted to try out new methodologies, and the other (EIAR) wanted to test technologies. So the technologies could be tested with the methods AHI was suggesting.

The INRM project aimed at contributing towards food security by improving natural resource management and agricultural productivity. It went through four phases, but the first stage (1995–1997) was geographically scattered and did not involve Galessa. The second phase (1999–2000) looked at improving income through farm diversification, intensification, soil conservation, fertility improvement and integrated pest management. The third phase (2002–2004) focused more on social issues and process documentation and used participatory and interdisciplinary approaches. The fourth and final phase (2005–2007) focused on scaling up technologies and knowledge, and strengthening local institutions and by-laws (GWP publication 2008c).

The output of those four phases of the INRM project was detailed resource characterisation of farming systems, livestock production systems and others. Furthermore, on-farm research has been carried out on potato and barley varieties, triticale and linseed; multi-purpose tree species introduction; composting; run-off, soil and nutrient losses; and the introduction of apple varieties. In addition, several of those technologies have been scaled out within the watershed through, for example, Farmer Research Groups (FRGs). Capacity building programmes incorporated training for farmers, researchers and DAs, and cross-site visits, field days and workshops. The INRM project also developed three springs, and it handed over a mini-weather station, a community-based tree nursery, seven diffuse light stores for potato seeds, 12 energy-saving stoves and three cross-bred dairy cows to the farmers in Galessa (GWP publication 2008c). In the beginning, IWM in the AHI project involved different disciplines but not the local stakeholders in problem identification and decision-making. Soon AHI turned towards a more participatory approach, and IWM turned into PIWM.

3.2.6 ENROLLING THE FARMERS IN THE GWP

In Galessa the first step was the geographical delineation of the watershed (GWP publication 2008b: 12-13); then the diagnosis of the NRM problems started. This involved: ‘establishment of a community entry protocols, identifying watershed issues, generating consolidated list of watershed issues and participatory ranking of identified watershed issues’ (GWP publication 2008b: 13). This is the point where the INRM scientists as *designers* of the project script – in particular the scientists representing AHI, HARC and FRC – involve the farmers as users in a

participatory process. This sounds like a linear process when reported, but in practice it was a difficult journey that involved negotiation with government and extension officers, farmers and local authorities, as well as agreement among the scientists working for the INRM project, not only about the location but also about the process. These challenges may have helped to convince some of the scientists working for the INRM project that a new, more participatory approach could help to achieve more sustainable results. Further inspired by new approaches introduced by the AHI scientist (see 3.2.3), the scientists from HARC, AHI and EIAR who participated in the INRM project contacted the farmers directly. Consultation meetings as well as individual interviews and informal encounters helped these scientists to learn more about the farmers' problems and preferences, and this was also appreciated by the farmers:

> They [the scientists] first asked the communities their problems, and we said our first priority is water; also there is a tree planting problem. After that these people who came from Holeta Research Centre promised to solve this water problem as well as to plant these seedlings. Therefore the people agreed. (Farmer, 42 years, Gebeyi, interview, 9.5.2010)

During meetings with farmers in the watershed, a list of 48 different problems was collated, and this list was then condensed by the scientists working for the INRM project at the research centre (E-Scientist, 2.11.2009). The farmers as users thus engaged in the process and suggested priorities. Then the priorities were refined by the scientists as designers and presented again to the users. In doing so they took the final decision away from the farmers to their offices, in order to decide if some of the problems were referring to the same or similar issues, and to prioritise the more relevant ones. In the INRM report this process was also described in detail:

> Once watershed issues have been identified by different social groups, responses from the different groups were lumped into a single list and repetitions eliminated to reduce the list to a manageable number of issues for subsequent ranking and planning. Thirty-nine watershed issues, which were identified by local residents at Galessa, were combined on the basis of their similarity into 18 issues (Table 1). This involved a great deal of discussion, to ensure that the issues had the same meaning when articulated in the farmers' own words before deciding to combine them. […] a representative sample of watershed residents were again consulted on the basis of established social parameters such as gender, wealth, age and landscape locations. That time, however, they were asked to rank the relative importance of identified issues. (GWP publication 2008b:15)

According to farmers the first priorities they mentioned in the problem ranking were water supply and tree seedlings. These priorities were also reflected in the INRM report; according to their results the highest priorities were given to loss of indigenous tree species and poor water quality (GWP publication 2008c). The INRM scientists therefore developed springs for improved water supply for people and livestock. A community nursery and one of the springs

were located close to the road and now serve for demonstration purposes, for example, for field visits. This was certainly not easy for a research centre to push through, as strictly speaking this is extension work and not the task of a research centre:

> Water was the first problem for farmers. But water containers and construction of such things is not the mandate of research. So we were challenged by the farmers on the one hand, because their problem, the first problem is water, but from research, especially from officials, no, this is not our mandate. This is the mandate of water boards or any other NGOs. But since we had support from the project, we tried to really compromise this thing with participation of farmers. So three water points were identified and constructed. Now, people are really maintaining those very well. (E-Scientist, interview, 29.10.2009)

By addressing the main priorities from the farmers' long list, which were selected in a long and interactive process, the INRM scientists gained an entry point to work with the farmers. This was a new experience for the farmers and the INRM scientists, and it helped to establish a good relationship between them. The farmers as users agreed to the planned activities and the scientists as designers started the implementation. The users formed groups based on decisions made in the villages during meetings, and they cooperated with the scientists and participated in implementing technologies in Farmer Research Groups (FRGs). The FRGs focussed on different topics (potato group, nursery group,…). The nursery FRG established the community nursery with support from the scientists in the INRM project. For this purpose the INRM scientists also provided new technologies (new seed varieties for cropping, cross-bred dairy cows, seeds for different tree species….) and advice and training on how to use them.

The INRM scientists also gained the support of the *woreda* administration that helped them to get in touch with the farmers and in implementation. At a later stage the INRM scientists had less opportunity to engage directly with the farmers in the project area. Information was passed on to selected individuals who were expected to pass this on to all others. Meetings seldom took place in the presence of scientists any more. As these processes took place before my research, I cannot assess to what extent gender issues and social structures in the villages had been taken into account. Later on however, the neglect of such issues turned out to be quite problematic.

Within the watershed, the INRM scientists appointed one farmer as contact person to work in close cooperation with the local coordinator. Through working for the project he gained substantial influence in the community and improved his livelihood at the same time. He was a convenient partner, as his house is located next to the road, he speaks fluent Amharic, and

through his background of a feudal family he has had a good education. His ability to communicate in Amharic is important, because many of the scientists of HARC do not speak Oromiffa, the local language. Many farmers see him as the prime beneficiary of the project. On his land one could find most of the technologies introduced by the project: the cross-bred dairy cow, the diffused light storehouse for seed potatoes, the apple trees, the beehives. The INRM scientists selected him because he was pruning his trees in an innovative way and won a prize for this. However, his motivation to innovate appears to have decreased somewhat since then. It seems more as if he is providing his farm as a showcase only. There has been criticism that he benefited too much, especially as he was one of only three farmers who got access to a cross-bred dairy cow. However, at the time of our research the cow did not conceive for almost a year and visibly lost weight, and finally during *kraemt* in 2011 the cow died. This was personally tragic for him, as a landless farmer with four sons, but it was also problematic for the community, because a female offspring would have had to be passed on to another farmer, thus distributing the benefits throughout the watershed.

But the INRM scientists' belief is that their role is also one of facilitation. This presumes that the farmers alone cannot handle technologies such as these; they need the assistance of the scientists to do so. In a sort of ping-pong effect this seems to have become reality to some extent: the farmers still expect the scientists (especially those from HARC) to play that role and ownership of the project is not high without their continuous presence. One of the scientists working for the GWP described this as follows:

> Ya, the contribution of research is just, the first one is to…provide technology. Because as I said, because technology is not only like seed or something, it is an information, how to control for instance late blight […] Because sometimes farmers eh, they know the problem, and they know the solution even, but they need somebody to organise them, you see, the case of water points, they know that it was a problem, and it is possible to really build that point, but somebody should take the initiative, and really facilitate. […] So that type of information, technical support is the role for us researchers. The main thing is just to organise people, and facilitate. (E-Scientist, interview, 2.11.2009)

In his perception it was obvious that the farmers would not be able to work alone. He believed that even if they already knew the solution to 'their problem', they still needed someone to organise them (compare 1.4.3.4 on mass mobilisation) and to 'lead' them. He then suggested that this 'leadership' should be taken by the scientists. This perception of leader and disciple is in line with the description of how participation and authority is framed in Ethiopia that I discussed in 1.4.3.4 (compare Harrison 2002). There is still a widely spread assumption that the 'peasants' - as farmers are still called in both scientific publications and policy papers in

Ethiopia - need someone to guide them. However, rather than getting too involved in village affairs the INRM scientists preferred to hand over responsibilities to designated village representatives, elected by the villages. Unfortunately in doing so the GWP has supported a group of village representatives that form a rather uniform group of similar age, education status, wealth, and are even close relatives in many cases. Regarding gender the GWP has taken care to also give some responsibility to women, so each village also has a female representative. These representatives attended training sessions provided by the project, and they were also the first to gain access to new technologies, such as improved varieties of seeds as well as cross-bred dairy cows.

The real backbone of the project is the local coordinator, who was a former PA chairman, and who lives outside the watershed. It is due to his diligence and cooperativeness that HARC is still able to cooperate with the farmers in Galessa in a fairly uncomplicated manner.

The actual activities of the project were repeatedly listed by researchers and farmers alike. Farmers and researchers commenting on the project during focus group discussions and interviews usually described the GWP as a showcase example of a successful research intervention, but many voices expressed concerns as well. It is also noteworthy that the GWP was known in Ethiopia to be in many ways exceptional and not the norm, especially in its interdisciplinary and participatory character. I learned this at several occasions when I witnessed presentations about the GWP in public workshops in Ethiopia.

3.2.7 CRITICAL REFLECTION ON THE IMPLEMENTATION OF IWM

Galessa was a very poor area facing food insecurity and extreme poverty at the time when the GWP started. Farmers were growing only potato and barley and these were prone to frost and drought. Thus the introduction of improved and new crop varieties in itself was already a huge asset to them. However, in other respects farmers seem less cooperative, especially when it comes to SWC. The community nursery cannot compete in performance with private nurseries. In one homestead garden I saw *heto* (*Hagenia abyssinica)* propagated by an elderly farmer (see 4.2.1). It is very difficult to regenerate, but it was twice as high as the one in the community nursery. Even in the case of eucalyptus the neighbouring private nursery had much bigger plants than the community nursery. Soil bunds (soil and water conservation constructions) were applied, but far less than as desired by the researchers. This also applied to many other technologies introduced that do not provide immediate benefits. Consequently,

researchers often complained about the lack of adoption by farmers.

> We have recommendations. Do farmers follow this? […] I think much has been done to improve their tree management practices. From some observations I think that from the work load farmers are not ready. That is my guess. [….] the survival of the trees on farms was low when compared with protected rehabilitation areas. So it means here there is better management there. When we invest time we think that it is for good cost so when farmers plant eucalyptus the survival is quite good and the growth is fast. (E-Scientist, FGD, 24.1.2011)

This scientist, rather than evaluating the technologies supplied, blamed the farmers: they were not ready to take the work load, so he suggested. However, private nurseries in Galessa worked much better than the one initiated by the project (that depended on seed provision by HARC that was notoriously late during my time there). He also observed that trees on farms had better survival rates than protected land outside the farms. This suggests that one of the reasons for lack of adoption could have been lack of ownership, and that a more critical and comprehensive assessment of the farmers perceived 'unwillingness' to adopt new technologies would be required.

Also problematic is the attempt to upscale experiences from one watershed to larger areas – it does not consider the contextual factors that come into play. Even in one watershed it is hard to find a true success story. The researchers usually bring many new technologies such as improved seeds and SWC technologies for the farmers to implement. But frequent introduction of new things, and the wide range of technologies to implement as well as the costs associated with introducing new technologies on a small farm make it difficult for farmers to implement them. In the study area most natural resource related interventions were based on IWM, which has become a panacea of development interventions in rural areas of Ethiopia. However, as also pointed out by German, Amede and Stroud (2006), watershed management is an approach that can be used by multiple actors with multiple visions of the concept, who may have contradicting, and certainly different, understandings of what the 'watershed approach' contains.

In the case study area, the watershed delineates an area of five villages; however, some of the farmers living inside the watershed own property outside, and some of the farmers owning property inside the watershed live far away, and have less immediate interest in getting involved in soil and water conservation compared to those living there. Another complication is that social networks are not delineated along ecological boundaries – kinship relations as

well as social institutions may extend to other areas, but a watershed project cuts through those networks and creates an artificial division in the social life of families and communities. Moreover, IWM cannot cover all the issues of the farmers, so a selection must always be made. The most burning issues were beyond the scope of the project – the increase in population and the lack of off-farm labour has led to a division of land that decreased and fragmented farms to less than 1 ha (Zenebe 2005).

3.3 AMBOBER: EXCLOSURE MANAGEMENT

3.3.1 AMBOBER WATERSHED AND ITS PEOPLE

Ambober watershed is part of Gondar Zuria Watershed and located in Maksegnit Woreda, about 50 km south of Gondar town (Figure 3.6). Ambober Wuzaba, the *kebele*, is about 15 km from the main road and can only be reached by a badly maintained mud road. I was looking at two villages within the watershed, Wojnie and Woglo. The village of Wojnie is partly located in the upper parts of the watershed (Lay Wojnie), and partly in the lower parts, next to the second village, Woglo. These lower parts are located at the foot of the mountain range that forms the watershed. While the upper parts have some forest cover and woody grassland, the lower parts are plain lands with hardly any tree cover at all. The plains (*walka*) also have different kinds of soil (black soil), areas with termite infestation and generally higher temperatures than the upper parts of the watershed. (Figure 3.7, Figure 3.8)

The farming system is

> a subsistence mixed farming which integrates crop production with livestock production. […] The major crops grown in the study sites, according to Libokemkem and Gonder Zuria district office of agriculture, are Teff (*Eragrostis teff*), sorghum (*Sorghum bicolor*), wheat (*Triticum aestivum*), Barley (*Hordeum vulgaris*), Faba bean (*Vicia faba*), Maize (*Zea mays*), Finger millet (*Eleusine coracana*), Field pea (*Pisum sativum*) and Niger seed (*Guizotia Abyssinica*). (Tesfaye 2012:18)

Teff is the priority crop for food and cash income, and Rhamnus (*Rhamnus prinoides*) also plays an important role (Tesfaye 2012).

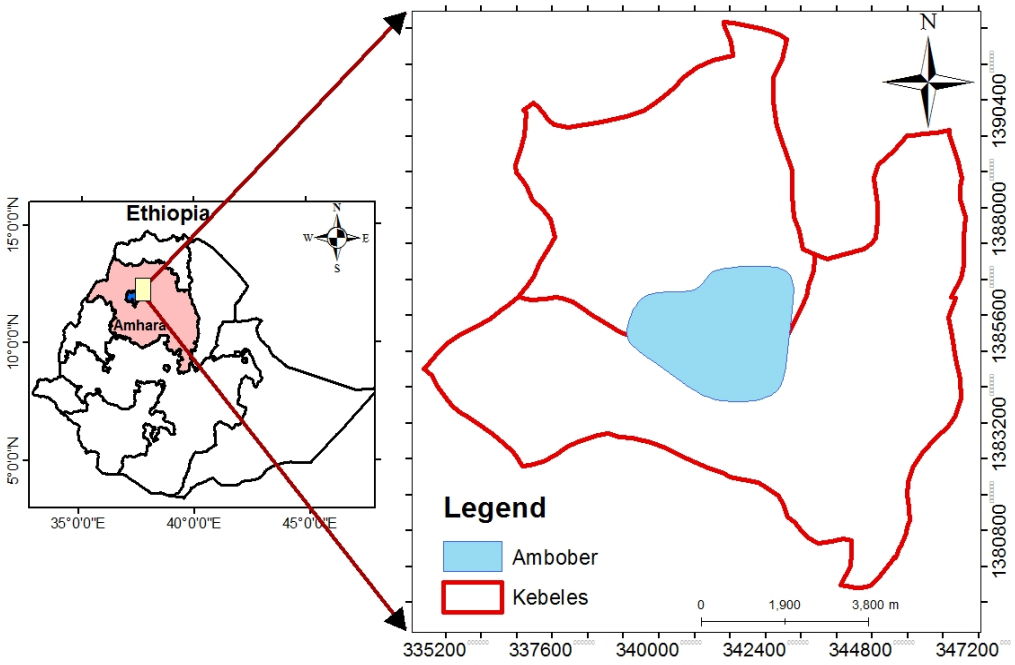

Figure 3.6: Map of project area Ambober. The *kebele* of the study site is called Ambober Wuzaba and it is located on the Southern end of Ambober Watershed (located at the centre, extending over the boundaries of two *kebeles*). (Map produced by Menale Wondie, ARARI/BOKU)

Figure 3.7: Exclosure management site in February 2011, Ambober.

Figure 3.8: Agricultural landscape in Ambober, North Gondar, Amhara Region (February 2011).

Previously the area of Lay Wojnie (Upper Wojnie) and parts of Tajj Wojnie (Lower Wojnie) were inhabited by Falasha, Ethiopian Jews, who were craftsmen and worked as blacksmiths, weavers and potters. During the Derg regime (1974–1991) and the transition period (1991–1995) nearly all Falasha left owing to the threats posed by the atrocities of the Derg regime, civil war and famine. Two rescue operations by the Israeli government (Operation Moses 1984 and Operation Solomon 1991) airlifted the majority of the remaining Falasha to Israel. Nowadays Ambober is inhabited primarily by Amhara and Qemant people. Their religion is Orthodox, with some differences in religious practices between the Amhara and the Qemant. The language spoken in the area is Amharic. The Qemant language is not spoken widely any

longer (Ato Nega Getu, chairman of the Qemant, pers. comm. 2010). The Qemant are not recognised as a separate ethnicity by the Ethiopian government, and many Amhara do not appreciate the differentiation of Falasha and Qemant as separate ethnic groups.

Migration to the area went through several stages: in the upper part of the watershed (Lay Wojnie) the dominant issue was the replacement of the Falasha by the Qemant and Amhara from other areas. There is some conflict between those newcomers and the original Amhara remaining in the area, but it is a hidden conflict that is hard to grasp. In Woglo, the lower part of the watershed, there were hardly any Falasha, but the settlement and increase in population is also a more recent one – in the 1960s the plains were still sparsely populated, but settlement has rapidly expanded towards the hillsides. A lot of the farmers were living in a nearby area called Fenter and came here to plough the land, but after some time they decided to live here.

The society in Ambober is patriarchal with a strict separation of social life between men and women. The women are often confined to the homestead, while men plough and sow, carry the harvest and do most of the work on the fields. However, in contrast to this general representation there are also other women who participate in all farming activities, except for ploughing. Regarding decision-making on household level it also depends on the individual family how this is handled. The official version is that a kind husband will consult his wife, but never will the wife express her opinion outside of the home. In reality there are families where the wife is the prime decision-maker, others decide jointly, and there are also families where the man does not involve his wife in any decisions. It is however not common for a woman in Ambober to speak in public. At the multistakeholder meeting at the end of my research I repeatedly and strongly demanded the participation of women of different age groups, wealth and family status. Finally a group of about 15 women joined the meeting, and a very young woman even made a presentation of their group discussion in front of the whole group. This was another indication for me that the situation of women in Ambober was more multi-layered and complex than generally represented by scientists and extensionists.

Nevertheless female-headed households face many difficulties, as they have to give their land to male sharecroppers who can take advantage of the situation because women cannot easily negotiate with men. Even though they actually own the land, the arrangement is often to their disadvantage, unless the sharecropper is their son or close relative. Shortage of land and unfair sharecropping arrangements are also a problem for many of the young, landless generation. This is one of the biggest issues for the people in Ambober. The growing group of the young

landless is highly discontent and demands that the older generation should hand over land to them. Additionally many demand land redistribution. These disagreements are partly a reason why land registration had not made much progress when I finished my research. And the young landless are also accused of engaging in crime and causing insecurity and fear among the other villagers: illegal logging and charcoal making as well as livestock theft, robberies and rape were mentioned as examples. However, these young landless are not necessarily descendants of poor families: the dispute also exists among wealthier farmers with many sons who now do not know how to divide the land between them. Furthermore, even educated sons and daughters often return to their homes if they did not get a job after graduation, or if they got into some kind of trouble such as unwanted pregnancies.

Religion is an important life for people in Ambober, where most farmers belief in the Ethiopian Orthodox Church. Wojnie has a church forest with remnant trees (Figure 4.7). The church is surrounded by old, indigenous trees in a circle around the church as can typically be found all over the Ethiopian Highlands (Binggeli, Desissa, Healey, Painton, Smith and Tekelhaimanot 2003). The church forest in Woglo on the other hand is a recently regenerating forest area, as the church was only rebuilt in 1956 after having been destroyed several times in warfare. The area was used for grazing before the church was rebuilt, and there were only some olive trees and bushes left.

Traditionally, the Qemant used sacred groves as places of worship and called those special groves *degena* (Gamst 1969). They were used for annual ceremonies. Smaller sacred sites were were usually single trees supposedly inhabited by particular powerful spirits (*qole*) (Muluna Marsha interviewed by Graham Hancock 1992: 243-249; Levine 1974: 48). The Falasha were using such sacred groves, and often had sacrificial stone pillars (Hancock 1992). It is likely that the Orthodox Church has in many places appropriated such places of worship to build churches and to convert followers of older beliefs. I will elaborate further on the role of religion and spirituality among the Qemant and the Amhara in 4.2.2.1.

Workamba Forest in Lay Wojnie, the big forest area composed of some indigenous trees but mostly a big eucalyptus plantation, was not a forest or grazing area before the eucalyptus was planted, but it was the main settlement area of the Falasha of Wojnie. The Joint American Fuelwood project created this large forest area during the Derg. It was then closed to grazing and public use. Nowadays villagers can buy wood and grass from the Forest Committee, but it

is still closed for grazing. The concept of exclosure is therefore associated with that particular time and its unpopular regime. Furthermore, farmers do not like to have trees on their land far from their home, because they cannot control them. Villagisation (forced movement into closed settlements) during the Derg was unpopular, as the Amhara traditionally prefer to live at some distance from each other (Levine 1974: 113, but also emphasised by several farmers in Ambober during the interviews).

3.3.2 THE SOCIAL WORLD OF THE SCIENTIST

AR is from Bahir Dar. He was born in the middle of the town and grew up there. In his immediate family there are no farmers, but there are some relatives of his mother who are farmers. He got his first degree in forestry in Ethiopia. He did his MSc in mountain forestry at BOKU, and later he did his doctorate there as well. Studying forestry was not his first choice. He would have preferred to study social sciences or other more applied sciences at Addis Ababa University. He also joined societies like the Society of Ethiopian Natural History, the Wildlife and Natural Resource Society and helped to establish a Nature Club at Wondogenet where he was studying.

After his first degree he started working for the agricultural research system, and he went to Sirinka. He really enjoyed his time, as there were good people to work with and a good environment. At first Sirinka did not belong to the Amhara Region Agricultural Research Institute (ARARI) (1.4.5), only later on with decentralisation. After his MSc in Austria he returned to ARARI and worked in Sirinka again, but then he chose to transfer to the new research centre in Gondar. Yet, Gondar did not have the advantages of Sirinka to work as a scientist: in Sirinka there were research plots, experiments and it was close to the farmers. It seemed like a research camp to him.

He decided to join BOKU because of the recommendation of an Ethiopian senior scientist who had been part of the development of the new MSc programme at BOKU. This recommendation and the availability of a scholarship convinced him to apply. He wanted to achieve a high quality education in a new, challenging environment, and was interested in learning German. However, he did not succeed in the latter and was not happy about that.

AR is a sociable person with a close circle of friends in his hometown Bahir Dar. During the time of his doctorate he also got to know his wife who is also a researcher, and they have two children. AR is an ambitious scientist who has many new ideas and visions, and this also

impressed his supervisor at BOKU. They have continued their cooperation after his graduation, and they want to continue working with farmers in applied research projects.

3.3.3 PROJECT DESCRIPTION: THE EXCLOSURE PROJECT

This KEF project was developed during the first stage of AR's doctorate. It was submitted to KEF in 2008. Ambober was selected after the approval of funding. Originally the proposal suggested demarcated exclosures and the use of solar-powered fences. Instead, an exclosure site as part of the Sustainable Resource Management Program in North Gondar (SRMP-NG) of the ADC was established.

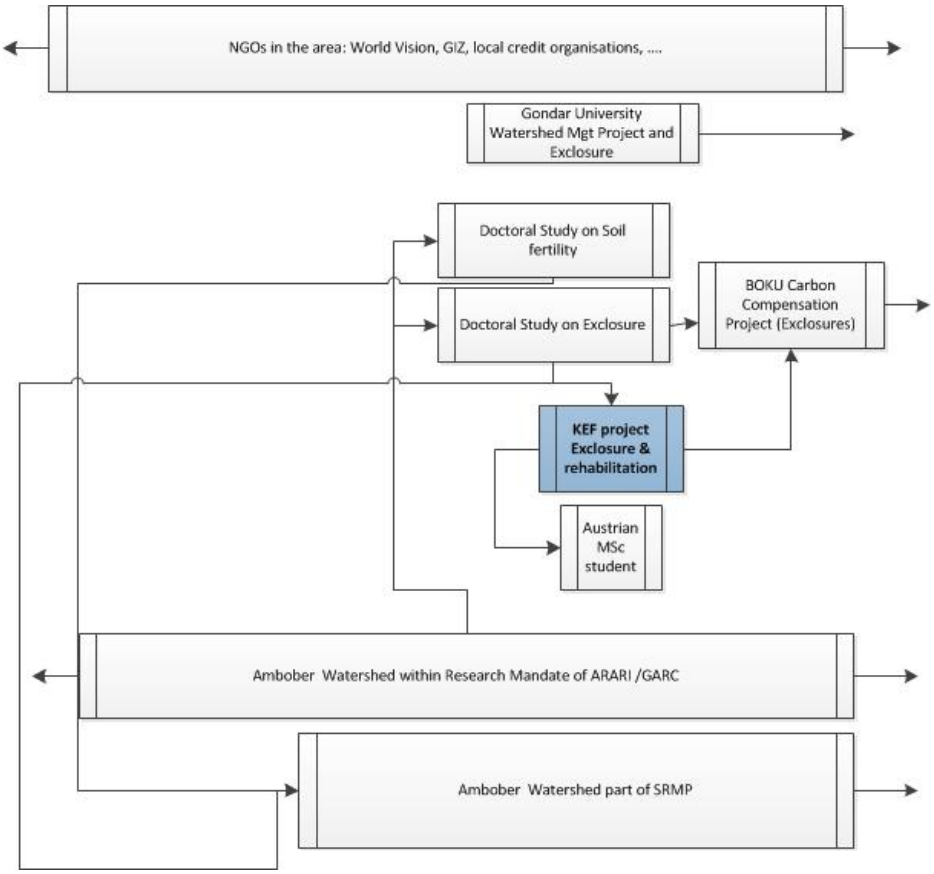

Figure 3.9: Case study 2, Ambober, network of project activities.

The actors the exclosure project (EP) was working with were from the SRMP-NG project; the Woreda Bureau of Agriculture and Rural Development in Maksegnit (including a SRMP-NG representative at *Woreda* level); the DAs in Ambober; the *kebele* administrator; the Watershed Committee in Ambober; guards (of the exclosure); the population using the enclosed land prior

to establishment of the exclosure; and other farmers having an interest in the site or the project as such - among them were influential farmers like model farmers.

Farmers living in the area of the exclosure and having a stake in the land as well as potential beneficiaries of the exclosure revenues are the *users* in the project script. The *designers* are AR, his supervisor and initially also the staff members of SRMP-NG who were involved in the discussion about the design of the exclosure project. This was primarily the contact person at *woreda* level.

The scientists interviewed regarding this case study apart from AR were firstly other scientists working in Ambober, either in cooperation with him, or related projects. These were projects on soil research, watershed management, natural resource management by one other doctoral student at ARARI (1.4.5) and one at Gondar University. Secondly I also interviewed two of his colleagues at ARARI who were working in forestry research and soil and water conservation research, as well as two Gondar University staff working in forestry and environmental research. The majority of those scientists interviewed completed at least one degree at BOKU University in Vienna, some of them did both their Masters and Doctoral degree at BOKU. Therefore I also interviewed five scientists at BOKU who had supervised these students and knew about this project and the site. Thus, when I am not referring to AR and his supervisor directly, I am referring to the other scientists mentioned above when talking about 'the scientists' in the context of the exclosure project.

Figure 3.9 shows how the exclosure project is networked with other project activities in the area. The main difference from the GWP was that many of the other projects were still on-going, and that a new project (BOKU Carbon Compensation Project) had emerged from the doctoral study and the KEF project. The exclosure project was a small project, and did not have much connection to other research projects or NGO projects even though there was also other research going on in Ambober at the same time (see above). However, the exclosure project was embedded in the research strategy of ARARI that showed some interest in exclosures and rehabilitation studies. In fact, on a regional and national level in Ethiopia there is a lot of interest in exclosures as a potential solution to what is framed as the 'deforestation problem' by a wide range of actors in- and outside of Ethiopia (for details see 1.4.4.2). On the other hand, the exclosure project did have a good linkage with the Austrian funded SRMP-NG project. Especially at the beginning of his research, AR tried to communicate and connect with

SRMP-NG. However, later on this communication became less frequent and some conflict with the local SRMP-NG coordinator from the *woreda* arose (see 3.3.5).

The research in the exclosure project was about the role of seed dispersal, nurse shrubs and regeneration on exclosure sites for the restoration of ecosystem diversity. The exclosure project is therefore a mixture of a research and development project. In the logframe (EP KEF proposal 2008:16), the purpose is defined as (1) increase land productivity, (2) biodiversity conservation and (3) capacity building. This should be achieved by

> 1.1 Increase land productivity at the household level with less costly external inputs by 100 % in 2020 in NG
>
> 2.1 Native Woody Plants (NWP) diversity in the rural landscape of NG increased by 100 %
>
> 3.1 Increase the no of MSc and PhD holder professionals in Amhara Regional State
> (EP KEF proposal 2008:16)

The logframe does not specify the role of users directly – they are only mentioned as passive receivers of information and indirect benefits (long term increase in agricultural productivity).

The narrative of the exclosure project is similar to the one of the GWP in its framing of the main issues of land degradation in the Ethiopian Highlands:

> The demand for arable land, pasture, timber and fuel has caused extreme deforestation in the Northern highlands of Ethiopia. The forest cover in Ethiopia went down from 35-40% to below 3% within the last hundred years (Hailu 2002). Remnants of the original forests are confined around churches and monasteries. The visible lack of regeneration in many of the remnant forests forecasts gloomy scenario for sustainable forest management (Alemayehu, 2007).
>
> Increased shortage of woody biomass for fuel led to use of dung and crop residue. This in turn creates mining of the already depleted nutrients from the soil and depressed agricultural productivity. The cumulative outcome has been very low performance in the crop and livestock sector as commercial inorganic fertilizer and animal feed are beyond the financial reach of the majority of the households (Glatzel, 2008; Hurni, 1994).
>
> (EP KEF proposal 2008:2)

The narrative describes a scenario of rapid deforestation in Ethiopia and predicts a dire future for forests in Ethiopia. It links the issue of deforestation with decreasing soil fertility and declining agricultural productivity as farmers are not able to compensate the lack of nutrients with inorganic fertiliser due to its high cost. At the time when I interviewed AR (2011) and his supervisor (2010) both of them had already changed their position on this issue. AR's

supervisor had come across alternative literature (McCann 1995, Munro et al. 2008, Nyssen et al. 2009) and he saw some documentation of European travellers like the drawings of the Ethiopian Highlands in Samuel Johnson's travel reports in Gold (1985). These alternative representations that depict a more complicated history of deforestation in the Ethiopian Highlands as described in their original narrative changed their mind. Both of them explained in the interviews that they believed (based on this literature) that deforestation had been a long process over hundreds if not thousands of years, uneven across the Highlands, and continuing until today.

In the proposal to KEF AR suggested exclosures as one solution to the problems outlined in the proposal (see quote above), because he believed that exclosures had the potential to address the issue of fuel and fodder shortage while increasing forest biodiversity and rehabilitating degraded lands at the same time. However, he claimed that there were also some problems in implementing exclosures (or enclosures – in the proposal he still used the word 'enclosure' while in his thesis and in the final report to KEF he used 'exclosure'[13]):

> Despite all the virtues it has, use of enclosures has not been intensified in North Gondar as the practice of open grazing has prevented the natural recovery of forests and fodder trees. The problem has been compounded as the villagers lack materials for fencing (such as wooden poles). (EP KEF proposal 2008:2)

Erecting a fence to delineate grazing areas from forests and agricultural land is a European concept, and not common in the Ethiopian Highlands. The only fences of this type that I saw in the Highlands were used to delineate land belonging to private investors. The three suggested types of enclosing land in the proposal to KEF were:

> 1. Live fences and live hedges (the former is a combination of trees and / or shrubs in close spacing combined with barbed wire while the latter is characterized by closer spacing without wire, Ayuk 1997, Choudhury et al. 2004) are options with a high potential for protection against livestock. They not only protect against livestock but provide fuelwood, fodder and food, act as windbreaks, improve soils (Choudhury et al. 2004) [….].
>
> 2. The facilitative role of nurse shrubs for establishment of trees is well documented, particularly in high stress environments (Maestre et al. 2001,Callaway et al. 2002). […] Nurse shrubs not only provide suitable microclimates, mulch and protection against herbivory (Callaway 1995) but also provide firewood. […]

[13] In the literature there is a confusion of terminology where terms like enclosure or area closure (Tekle 2001; Mengistu, Teketay, Hulten, Yemshaw 2005) and exclosure (Abyiu 2012; Ayinekulu, Denich, Tsegaye 2009) are used almost synonymously., even though there are also authors who differentiate those terms (Aerts, Nyssen and Haile 2008: 762).

> 3. Exercising more mobile enclosures around homes of rural households and nearby farms with less costly and less labor demanding livestock protection methods, such as solar powered electric fences (electric fences as used by the farmers in the Austrian Alps) will be a viable approach both economically and ecologically.
>
> (EP KEF proposal 2008:3)

Live fences and hedges are used in Ambober – around the homestead of farmers, but rarely further away from the settlements. Hence they were then not used to delineate the exclosure. Nurse shrubs exist in the exclosure, however not as part of fencing. The third suggestion was dropped altogether: apart from the technical challenges, the fencing material would have been of such high value for the farmers that according to AR it would have been difficult to protect it from being stolen. The suggestions show however that at the outset AR was quite concerned about how to exclude people and livestock from the area – as I describe in 3.3.5 – 3.3.7 this changed later on, and he showed much more concern about the role of the users in the implementation of the exclosure project than the proposal tells.

The objectives in the exclosure project's KEF proposal were listed as such:

> Study the diversity of the farming system and trace the underlying principle impeding or fostering diversity and hence productivity and stability of farms.
>
> Evaluate feasibility of different methods of enclosing land like live fencing, use of barbed wire and solar powered electric fences [14]
>
> Identify key factors affecting natural regeneration ecology of desired native woody plants in rural farms after enclosing and study the role of farm forests in conservation and restoration of native woody plants as well as soil restoration.
>
> Communicate findings continuously in the partner communities via action research, disseminate findings with broader applicability through ARARI research centers and build public – private partnerships for wider dissemination of solar powered electric fences if proven successful.
>
> (EP KEF proposal 2008:4)

AR's research questions were closely tied to knowledge and tree management of farmers in the vicinity of the exclosure. This does not come out clearly in the KEF proposal yet. At that stage AR designed a role for the users in the project script that was described as providing information about tree regeneration and tree diversity and productivity on farmers. Later on AR also carried out a household survey with 150 farmers where he documented household characteristics, spatial location, wealth and labour availability, and other parameters. AR also

[14] This objective was omitted in the final report (EP KEF report 2013) as it was no longer relevant.

wanted to collect biomass samples to answer the biophysical questions of his research. In the KEF proposal AR describes the potential benefits for the users. The first benefit for users is listed under the heading 'outputs to capacity development'; their role here is described as receiving information from the project:

> In the process of delivering the project output, training will be given for district development agents and other innovative farmers. This will help to improve local capacity development for better development performance. (EP KEF proposal 2008:11)

This statement narrows the understanding of who the users are to model farmers and development agents – while the main target group of the project according to the proposal are 'the rural poor households' (EP KEF proposal 2008:12). In practice AR was working in close cooperation with the DAs and *kebele* workers, some model farmers, but also other farmers in the vicinity of the exclosure who were not classified as model farmers. As contribution to development the project script outlines ambitious impacts on food security through improved agricultural productivity as well as 'improved conservation of biodiversity and other natural resources for sustainable development'. In this part of the proposal another role for the users is mentioned:

> On a short term and in fine scales, farmers will get immediate financial benefit from being part of the research or being hired in daily work during plot establishment, guiding during survey and from hire of draught animal for the researcher in remote areas. (EP KEF proposal 2008:12)

The users are also described as labourers for the exclosure project. The immediate income from this work is framed as an incentive for them to participate in the exclosure project. The designers agreed on a potential site for the exclosure based on their own criteria first (see 3.3.5). The designers discussed their proposal with the *woreda*, the DAs and the church, as well as representatives of the users (Watershed Committee, model farmers) (AR, interview, 21.2.2011). The final report to KEF describes how the site selection was implemented:

> The case study was conducted at Ambober. A watershed was selected not far from a church forest in consultation with farmers, development workers and scientists. The boundary of the watershed was delineated following the political boundary of the district. Inside the watershed, two hectares of exclosure was established on former de facto open access grazing land. The main actors were the farming community dwelling in the watershed, watershed committee from the farmers, development agents from the district office of agriculture, local authorities and scientists. The watershed committee has seven members and was elected by the community. Written rules which detailed rights and duties, and also monitoring and sanctioning rules have been developed and discussed and agreed up on. The rules also included electing and assigning guards for the purpose of monitoring and communication purposes, planting of high quality fodder trees such as cuttings of Ficus thonningii (F. thonningii was planted with five meter spacing within and between lines of

> trees inside the exclosure), and graduating sanctions, which include higher punishment for small ruminants than draught animals when found inside the exclosure. Additionally, meeting every three months was also suggested following the fashion of local social gatherings with feast.
>
> Different sets of data were collected by means of participatory observation documented with still and motion pictures, focus group discussions, interviews, and documents collected from watershed committees, guards and local authorities.
>
> (EP KEF Final Report 2013:6)

While doing his research on tree diversity, AR also did FGDs, transect walks and repeated farm visits, which gave him an opportunity to get to know the farmers. The selected site was declared an exclosure site after discussion with the users and thus was meant to exclude human beings and livestock from using the area without fences (Figure 3.). The users agreed – with some reservations (see 3.3.6). As a next step the designers started the implementation: trees and shrubs were planted, and terraces and soil bunds were erected as well as gabions to fortify the enclosing river. This was done by the users as paid work. The designers, first and foremost AR, intended to use the area as a research site. AR expressed interest to establish long-term research plots even beyond his doctoral studies. The role of the users that had been agreed in the meetings was to protect the area from humans and livestock (EP KEF Final Report 2013). Benefits for the users were not only income from labour and revenues through sale of grass and timber but also increased agricultural productivity (EP KEF proposal 2008, EP KEF Final Report 2013). The proposal to KEF also stated another target group, the global community:

> The global community may be targeted. For instance, increased abundance and diversity of trees on farms will contribute in the fight against global climate change by increasing carbon sequestration and being carbon sinks and also reduced greenhouse gas emission. (EP KEF proposal 2008:12)

The role of the global community is not further specified beyond this statement. However, in a follow-up project to the KEF project started in 2013, the exclosure project uses carbon compensation funds to finance additional exclosure sites in Ambober.

3.3.4 Origins and Context of Exclosure Management

The principle of exclosure is common in forest and protected area management all over the world. The differences are in the extent and the purpose of the exclosure. By definition, 'exclosures are ''areas from which unwanted animals, etc., are excluded'' and their main purpose is to keep things (animals) out of a given area' (Aerts et al. 2008: 762). Specifically in protected areas people *and* their livestock are often excluded. Jacobs and Schloeder (2001)

report on protected area establishment in Ethiopia that led to resettlement of the entire populations of national parks. However, this has in many cases led to conflict and encroachment of the closed areas, and people were even forcefully removed by the army in some places (Jacobs and Schloeder 2001).

The way in which protected areas have been managed in terms of exclusion of resource users has also been discussed critically by many other authors, such as Adams (2004), Brockington (2002), and Escobar (1998). Schultz, Duit and Folke (2011), in a global study of 146 Biosphere Reserves in 55 countries provide evidence that exclusion may not be the right way to carry out successful biodiversity conservation. They come to the conclusion that effectiveness in achieving development goals is associated with participation of local inhabitants, and that this effectiveness is not at the expense of biodiversity conservation (Schultz et al 2011). Beyond protected area management, the literature provides a plethora of other examples of exclosures from all over the world: for example, rehabilitation of grazing lands in Australia (Witt, Noël, Bird, Beeton and Menzies 2011); regeneration of an Irish ancient oakwood (Cooper and McCann 2011); and for rehabilitation of crop and grazing land in Mongolia (Hoshino, Tamura, Fujimaki, Asano, Ose, Higashi 2009).

In Ethiopia the establishment of exclosures was a response to land degradation, and its implementation started about two decades ago (Mekuria, Veldkamp, Corre, Haile 2010). The purpose of exclosures is to 'improve the overall ecological conditions of the degraded areas so that they can provide better environmental and socio-economic benefits to the local communities' (Mekuria 2010: 8). In northern Ethiopia the concept of exclosures is often applied as part of IWM projects. Their purpose is to protect the upper parts of a catchment area from degradation and erosion. Usually these are steep hills with shallow soils used for communal grazing land. By encouraging land rehabilitation in terms of improved vegetation cover as well as the development of secondary forests in a long-term perspective, degradation should be reversed and soil erosion should decrease to the benefit of those living in the lower parts of the watershed.

The decision about the area is usually part of a consultation process in the concerned farming community. In return, the community is allowed to use a certain amount of wood and (cut) grass. The allocation and distribution of these benefits are regulated through a committee that consists of representatives of the community. Exclosures have become part of government extension programmes for restoration and rehabilitation of degraded land, as well as the

national watershed management and sustainable land management programmes (Abiyu Hailu 2012).

The concept has been most successfully applied in Tigray, and is seen as a best practice example to be tested in other parts of the Highlands by many Ethiopian scientists and policy-makers. However, there are also critical studies. In some cases there are regeneration constraints from an ecological point of view (Abiyu Hailu 2012; Tewolde-Berhan, Mitlöhner, Muys, Haile 2002), and negative effects can be an increase of grazing pressure on other areas, as well as fuelwood shortage (Mekuria 2010). Most of the time the crucial points are the involvement of local communities and ensuring their benefits from the exclosure (Tewolde-Berhan et al. 2002; Nedessa, Ali and Nyborg 2005). Nedessa et al. (2005), therefore, recommend a more direct interaction between different stakeholders and the communities affected and a rethinking of the term participation, because

> Community participation in the past has been limited to consultation with community members where all had to agree, because the conservation element has been very strong in the establishment of the AEs [area enclosures]. For example, the government has emphasized the establishment of trees in the AEs, whereas the communities prefer a greater proportion of grasses for fodder. (Nedessa et al. 2005:35)

3.3.5 Application of Exclosures in Ambober

Selecting the site for the exclosure project took some time and negotiation. The site was also supposed to be at one of the SRMP-NG project sites. AR explained which criteria were applied by him and his supervisor to select Ambober:

> AR: […] we should overlap, we should overlay our research activities with the development activities so that the effect will be synergetic. And we are looking for the appropriate site for this purpose, which have a church forest and also eh, an intervention from Austrian supported project which has an exclosure, and they were working on 17 *kebeles* like Ambober. And from the 17 *kebeles* we found Ambober suitable, and others were not ideal to do our job. […]
>
> Birgit: So that was at the same time?
>
> AR: Ja. With the project office, with the development workers at Maksegnit and also the staff from the SRMP, the Austrian supported project, we look for different places, and Ambober was found to be ideal for our future work.
>
> Birgit: What did you particularly like about it? What was the decisive moment or the decisive criteria that spoke for Ambober?
>
> AR: The...decisive criteria were there was a church near in the area, and the exclosure which was supposed to be done in the area, there was a discussion that it should not be far

> from that patch. The exclosure area will not be located far from that. But it depends on the agreement of the local people. Therefore concerning the maximum distance that the boundary of the exclosure should be, we found it very ideal to study natural regeneration, or assisted natural regeneration.
>
> (AR, interview, 21.2.2011)

After that decision, and the agreement with the mentioned authorities, interaction with the local people on this matter could begin. According to the farmers who were involved in the process, they were informed about the exclosure during a meeting and had the opportunity to support or oppose it; the size and boundary could also be negotiated, except for one part that had reportedly been decided by the government beforehand. In spite of some opposition, the exclosure was then established. The meetings were intended to involve representatives of the concerned villages. These decisions and meetings happened before my research started, so it is difficult for me to know to what extent gender issues and the social structures of the villages were taken into account. However, as outlined above many women have limited possibilities to make their voices heard in such meetings, and many of the poor may not participate because they were either not invited, or they do neither have the time nor the wish to participate because of their feeling of disempowerment (see 4.2.4): my impression that this was the case was confirmed later on when different women in the FGDs and poor farmers during the interviews claimed not to know what the project was about, and some did not even know that a project existed at all. Even those who reported that they got paid for working at the site were not aware of the nature of the project, its objectives and benefits for the community at that time.

Later on a watershed committee was in charge of the local administration, bylaws were elaborated, guards were selected and communal work activities such as terracing and planting were carried out against payment by the project. The project also paid the guards. According to the project manager, the exclosure progressed well in the first years of its establishment, and some conflicts in the first two years were able to be resolved by meetings with the community. And so AR reports on this process in his thesis:

> The boundary of the watershed was delineated following the political boundary of the district. Inside the watershed, two hectares of exclosure was established on former de facto open access grazing land. The main actors were the farming community dwelling in the watershed, watershed committee from the farmers, development agents from the district office of agriculture, local authorities and scientists. The watershed committee has seven members and was elected by the community. Written rules which detailed rights and duties, and also monitoring and sanctioning rules have been developed and discussed and agreed up on. The rules also included electing and assigning guards for the purpose of

> monitoring and communication purposes, planting of high quality fodder trees such as cuttings of *Ficus thonningii* (*F. thonningii* was planted with five meter spacing within and between lines of trees inside the exclosure), and graduating sanctions, which include higher punishment for small ruminants than draught animals when found inside the exclosure. Additionally, meeting every three months was also suggested following the fashion of local social gatherings with feast. (AR 2012: 28)

A different kind of conflict arose when it was no longer clear to all actors whom the exclosure 'belonged' to. The SRMP-NG has a contact person at the *woreda* level who is responsible for the implementation of the project on the ground. And as the exclosure was developed in cooperation with the SRMP-NG, this person had developed a stake in it. The farmers complained to me that there was obviously a disagreement between this person and AR, because each advised the farmers to plant different kinds of trees. After some time AR managed to resolve the issue, and finally *Ficus thonningii* was given priority over *Cordia africana*, because the latter according to the farmers would not grow on such shallow soil. One day I observed that a whole pile of *Ficus* cuttings had been deposited at the lower part of the exclosure. When I asked the farmers they said it had been brought here by SRMP-NG, but they were not sure what to do with it. This example shows that it is not as simple as it may seem to administer a relatively small project like this in practice. Many farmers were suspicious, and may not be too helpful, unless they develop ownership and a sense that this is really to their benefit. Those benefits may also not be evenly distributed across the community, so if you talk to some farmers they will be enthusiastic about it, while others may tell you that they have no idea what is going on there but, for sure, they have not seen any benefit from it. I encountered both responses on different occasions between 2010 and 2012.

AR is passionate about the environment and the people living in it; however, it was very challenging for him to see people and livestock trespassing in 'his' exclosure. He genuinely wanted to protect the environment, and at the same time he was trying to do something good for the people. In his doctoral thesis he explains the importance of exclosures from his point of view. In essence, his prediction is that exclosures 'with proper management and enough time' facilitate the formation of secondary forests, increase floral diversity and improve soil properties: 'Exclosures can be very good tools for landscape domestication since they can give the opportunity for addition of new woody plants artificially or naturaly [*sic*], or modifications in the ways trees are managed' (AR 2012: 8).

At the time when I was there, AR was thinking a lot about how to collect more data on social issues and we often discussed methodological issues. The fact that he spent a lot of time in the

field was greatly appreciated by the farmers. AR wanted to do a lot of social research for his thesis, but he also wanted to do a lot of bio-physical research. To do both at the same time was however challenging given the large area and population he had to cover. The good relation he had with some farmers helped him in gaining an improved understanding of relevant social issues for the establishment and management of the exclosure. He genuinely made an effort in looking beyond his disciplinary boundary as a forester, strongly encouraged by his Austrian supervisor. Some responsibilities for the establishment of the exclosure could also be delegated to the DAs:

> Our responsibility in this closure area is that we will have sessions for discussions with the society in the area regarding the closure. And we will discuss about the ownership of the closure area and the sharing of the benefit from the closure. It is a communal property and everyone can get access to use benefits of the area. It is their property. And we will select responsible persons from the society to protect the closure from livestock and tree cutting by the people, and the guards will take advantage of the grass from the closure area. And after the land is protected and the forest will be productive, it will be useful for the society. (Interview with two development agents, Ambober, 12.3.2010)

In AR's representation in his thesis, on the one hand the exclosure took away access to common pool resources, while on the other hand it offered new income opportunities in terms of wood and grass sale. Some wealthier farmers told me that they bought timber for a good price from Workamba Forest, which was established under the Derg regime by the Joint American Project. One farmer from Wojnie described how the income was used by the forest committee:

> Farmer: There is a forest committee in this village. The wood and the grass can be sold to the community by a bid system. The money gained from the sale of wood and grass in the forest area will be used to pay the guards.
>
> Birgit: Who is in this forest committee?
>
> Farmer: They are actually changing. We are now selecting the new forest committee. […] Actually they misuse the money from the forest even though they have legal receipts. […] There are many conflicts in the committee because money has been spent somewhere, even though it has a receipt, there is an option of misusing this money. I am not a member of this committee because I do not want any conflict. I want only work. There is always disagreement because of the money, they are collecting from selling timber and the grass.
>
> (Farmer, 60 years, Wojnie, Village Walk, 24.3.2010)

The administration of such funds at village level can thus be challenging. For the exclosure project the villages elaborated bylaws for the punishment of transgressors, and also rules for the committee to administer the funds. How well this system will work is hard to predict, because the exclosure is still in its establishment phase.

Economically, the most interesting tree for the farmers is eucalyptus, apart from some local, valuable timber trees such as *Cordia* or *Olea*. However, the new exclosure does not plan new areas for eucalyptus; rather it tries to encourage regeneration of indigenous species. Neither is the main argument of researchers (or government workers) in support of exclosures the increase in available wood resources. The main argument is the need to combat land degradation, in line with their definition. But the benefits in terms of income generation are a useful argument to convince farmers to sacrifice scarce grazing land. The value of these benefits is difficult to predict and the first years after establishment may be difficult for the farmers. In the first few years the exclosure land can be used neither for grazing nor any other type of land use, nor are there any other immediate benefits to be gained. Harvesting from the exclosure is not allowed until a certain period of time has passed, usually around five years.

In general, however, there is an understanding among the farmers who were involved about the long-term value of exclosures. They observed this themselves, and they have been told repeatedly about the effects of deforestation and soil erosion.

> We continuously heard in conferences and meetings by the Rural Development or any government officials, when they are coming, they told us to plant trees and to protect the land. The other thing is, the trees are very important for us. It can be used as a fence. And it is used as a feed for livestock. It will bring us rain, and when you look at the surrounding areas of the church, it will have more rain than the other areas, because it has so many trees. And it will protect the land from erosion. If there are no trees in the land, we will never produce since the soil will be eroded. We can conclude that forest is our life and our asset. (Farmer, 34 years, Woglo, interview, 30.6.2010)

In his statement this farmer listed several different benefits of trees, like the increase in precipitation, the use of wood resources for different purposes, the fodder value of some trees, protection from erosion. He clearly recognised trees as an important component of their life and had interwoven the knowledge obtained at trainings with his own observations.

In 2012 the exclosure was developing well in terms of its bio-physical condition, and the acceptance among the community had increased. There were even other sites planned to be closed. From the point of view of researchers, the site is also a research site. Although Ambober is in the mandate area of ARARI (1.4.5), it is not easy to access and therefore unlike Galessa it is not a centre for research activities. Furthermore, on-station research is still more popular than on-farm experiments, and the change in attitude from the lab to the field is still on-going (E-Scientist, interview, 21.2.2011). Exclosures also need regular interaction with the

community, and while AR was happy to do that, many other researchers were not so happy about the prospect of staying in the field for several days. However, as I experienced myself, it was difficult to gain access to transportation to go to the field at his institution. Like me, he was often unable to get a car when needed due to the distance, the (especially during the rainy season) bad condition of the road, and the general shortage of vehicles able to manage this road.

3.3.6 Enrolling the Farmers in the Exclosure Project

The actual enrolment was less at the forefront of the project than in CST1, because the purpose of enrolment was mostly consent rather than participation. The intention was to create a sense of ownership among the farmers. AR and his supervisor at BOKU needed the consent of the farmers and the government representatives in order to establish the exclosure. This consent was crucial not only for the establishment, but also for the maintenance and sustainability of the intervention. And to achieve, extend and maintain this consent, a network of reliable and supportive partners at a local level was crucial. Thus for AR and his supervisor it was not only important to find the right place and the right partners (such as extension and development organisations), but they also had to find the right farmers to work with. Good relations with DAs (government) and the priests (Orthodox Church) were crucial as well. Starting from that point, they envisaged communication and negotiation with the community itself becoming possible. Yet one of the village elders, whom I interviewed as a key informant at the beginning of my research, told me the story of the establishment of the exclosure like this:

> Birgit: This hillside, why did you decide to have an exclosure there at this place and not somewhere else?
>
> Farmer: The first reason why we select this area was that this is accessible so that any visitor from Addis, Bahir Dar or Gondar can easily access this closure area, and can visit easily. And the second reason was that it is a hillside and stony and the soil structure is not so good. It is not very good for cultivation of crops and there will be high erosion of this area, coming around our village. It will erode the soil of the whole catchment area. But the area which is next to the street, it is not with our permission. They were already deciding to cover the whole area and they obligate us to give them. Because it was a grazing area, and it is now problematic to watch for livestock because it was a grazing area before. But we agreed if it would be closed for the upper hill side.
>
> Birgit: Whose idea was this to have an exclosure here? Who approached you with this idea?
>
> Farmer: The people from sustainable natural resources project with the Woreda officials had come with this idea and asked us about it in the Church, and they have asked us

> whether to work here with us in this *kebele* or not. I was the first one to raise my hand to support the idea of the project coming here, and because we have experience of other projects and we have experienced a lot of problems of soil erosion and low productivity of the soil. So we supported the idea of the project coming here. People working with the project benefited a lot and some of the farmers had got credit from the project to raise cow for milk production. One of the project activities was a closure of land which is degraded. They asked us about a closure and consult about the issue after some time.
>
> Birgit: What proportion of people agreed, and how many people disagreed?
>
> Farmer: On the closure of the hillside area we all agreed, but on the other side all of us disagreed, except someone who has all of his land in the lower side of the catchment. He has not so much interest on that area, and he proposed to cover the whole area, and he dominated because he is the chairman of the watershed committee. Even though we are against that idea, we feel that just being against the project is not important for the area and not interesting for us to be against a project working for us.
>
> (Farmer, 60 years, Wojnie, village walk, 24.3.2010)

The selection criteria he was giving were different from what I had expected: the first thing he said was that they wanted it to be accessible for outsiders, like a demonstration site. The second reason was less surprising: they selected a site not suitable for crops. He also pointed out that there was one area included that they did not agree with, and this had been decided beforehand by the government. As this affected some of the grazing land needed by the farmers, this was also a source of conflict later on. He then explained how they were asked whether they wanted this project or not. As this happened in the context of the Austrian project SRMP-NG most people did not understand that the exclosure was a separate project, a research project. This also shows that the people perceived that this suggestion came from the SRMP-NG project and the government. Therefore openly opposing the idea was difficult to start with – and in addition there was one powerful community member, the chairman of the watershed committee, who supported the idea of covering the whole area. The reaction the farmer in this statement described fits very well with the description of participation in Ethiopia by Harrison (2002) discussed in 1.4.3.4. Without further explanation he made it clear that it was not a good idea to challenge this person of authority, who used his authority to impose his decision on the others.

Depending on the interests of the people interviewed, the story of enrolment was told slightly differently. There was indeed some dissent and even conflict during the establishment of the exclosure. The decision to create an exclosure site in Ambober was not made based on something the farmers had told the scientist (AR). The community was informed and there was a discussion – but if they had said that they wanted to have a new school instead, it would not

have changed anything. The problem was identified elsewhere, and Ambober was a testing ground to verify if the exclosure is a good solution for it. The informed farmers did not see that negatively; on the contrary the fact that there was actually an engagement in terms of meetings and discussions where they were consulted, even though the actual issue had already been identified, was greatly appreciated. The more problematic aspect of this process is that a relatively large part of the community remained ignorant about this – thus it is not clear who the 'informed farmers' are, and who the excluded ones are, and why the latter were not able to participate in the process in an informed way. This is an indication that there is a substantial group of people in the concerned villages who hold a firm grip on power, stand in good relations with the authorities, and thus are also in a good position to establish connections with incoming project activities. The interests of those silenced during the meetings or excluded from participating may be different from the interests of those powerful elites: some may be more interested in keeping the land for grazing, others may prioritise grass over trees, there may be disagreement on the tree species, and on the size and location of the exclosure. Considering these aspects that may vary among some men and some women, some of the young and the old, the rich and the poor, and other groups in the villages takes time for lengthy negotiations and resources that this project did not have.

While this place was a potential site of soil protection, tree regeneration and overall high biodiversity and general aesthetic beauty for AR and his supervisor, only some of the farmers, step by step, came to see those values, and even then interpreted them according to their own social worlds. The main part of my study was carried out in 2010, still at the beginning of the exclosure. It is therefore not surprising for me that AR in his thesis writes as follows:

> The most important problem before establishment from the resource users' side was opposition from some members of the community concerning the actual place to be enclosed. A problem that persisted throughout the study period was releasing animals to the exclosure, transgressing of the boundary of the exclosure by neighboring farms, attempts of concealing kin-wrong doers from being sanctioned or punished by some members of the committee and boundary dispute with the exclosure. In 2009, eight people opposed the establishment of the exclosure at the village meeting. Those individuals were closer to the exclosure and those who have higher number of livestock. […] Although only eight people disagreed openly at the village meeting prior to the establishment, 20.8% of the population were reported sending their cattle into the exclosure, which was against the agreed upon by-law. However, in the course of two years time, in 2011, only 6.5 % of the total population continued breaking rules of not sending livestock to the exclosure. (AR 2012: 65-66)

For a sustainable development of the exclosure perhaps a more transparent and more equity-based approach would have been helpful. If those in power and strong supporters of the

exclosure fail to adopt this approach in the future, there is a high risk that the wider community will not have enough ownership to maintain the site successfully.

3.3.7 CRITICAL REFLECTION ON THE ESTABLISHMENT OF THE EXCLOSURE

In Ambober many farmers are worried about the limited availability of land, the decline in soil fertility and productivity and the eroding effect of rainfall on the land in the hilly areas. The land issue is a very sensitive topic. Given the current demand on land it is likely that the average size of land holdings will be even further reduced. And there are complaints among the younger, landless generation that elderly people do not want to hand over the land but offer different types of disadvantageous land contracts. These contracts offer little security to the young, as they can be cancelled any time, and they often are to the advantage of the one giving the contract rather than the one taking the contract. However, the need for more land is so imminent that nowadays grazing land on steeper slopes is again turned into cropland. This of course makes it difficult to negotiate land for an exclosure area, because grazing land is increasingly limited. This affects both rich and poor – the rich because they have a lot of livestock, and the poor because they have no alternative to grazing on free areas as well as taking advantage of the remaining resources in these areas such as wood for charcoal. Through the introduction of cross-breds, keeping smaller amounts of livestock has become more attractive for rich farmers in Ambober. For the poor investing in a cross-bred dairy cow is unthinkable, due to the costs of acquisition, veterinary bills and additional food and the risk of investing so much in only one animal. Risk diversification and stratification is an essential survival strategy for farmers living in Ambober. However, the reasons for illegal land use are diverse and affect both rich and poor people:

> DA 1: The major cause of this problem is poverty, and this is the only income generating activity for some households which lack land: charcoal selling or selling of fuelwood to the nearby town people. […]They asked us a question 'What shall we do? We don't have other options'.
>
> DA 2: But there are some cases, where even the rich people are cutting trees […]
>
> (Interview with two development agents, Ambober, 12.3.2010)

Some of the more senior and wealthy farmers also told me frankly that it is both rich and poor people cutting trees and using the natural resources unsustainably.

The exclosure is visibly developing in a positive way from a bio-physical point of view. In his thesis AR provided other relevant data as evidence for the successful development of the

exclosure. He looked at two trees specifically, *Olea europaea subsp. cuspidata* and *Schefflera abyssinica*. *Olea* is a tree of high interest to the farmers, as its wood is very durable and can be used for a number of purposes, most of all to make *erff* and *mofer*, plough components. *Schefflera* on the other hand is a tree of more interest to the scientist than the farmers. It grows in inaccessible steep areas, and does not have much use as compared to other tree species such as *Olea*, *Ficus*, *Cordia* and eucalyptus, but it has a highly interesting regeneration pattern and important ecological functions. Nevertheless, there were also a number of farmers who developed an interest in the work of AR, and even though the farmers were not actively involved in a learning process, some exchange took place. This was also acknowledged by AR, who emphasised that some farmers had a lot of 'indigenous knowledge'. Asked about his thoughts about the future of the exclosure after the end of the project, the project manager was still cautious in February 2011:

> AR: Ah...it may not be easy to predict what will be the fate of the exclosure after the exit of the project. Some work should be done before that, and some social communication so that attachment and the sympathy will be equal among the villagers near or far from the farmland, those who have livestock who wanted to get it for immediate use, and also some other innovative or some people who have sympathy towards green. This will be some compromise or sort of harmonisation among the villagers. What is the aim, what is the benefit and cost also. There are frustrations and their concerns should be entertained before exit. (AR, interview, 21.2.2011)

From the original proposal to this point AR had made many experiences and learned many lessons. He realised that establishing an exclosure first of all needed support by the people. He realised the diversity of opinions among the people living in the villages – and that it would not be easy to find a compromise between them.

In spite of those contextual difficulties there are benefits of exclosures: first, if implemented properly it can be applied locally, and on a small scale, and farmers quickly see successes. They can also benefit if grazing rights and rights to use grass and wood are allocated properly. The key is to find a local management mechanism that ensures fair and sustainable management of the exclosures.

3.4 Comparing Scripts and Framings of The Galessa Watershed Project and The Exclosure Project

The reports resulting from the GWP focus on Integrated Watershed Management as the technology dominating the project's script. The script is oriented along the requirements of bio-physical research, but it is also interdisciplinary and participatory (on a consultation level,

partly involved in decision-making, as defined in the project) (3.2.3). There is a long list of technologies applied within one framework (3.2.5, and more specifically GWP publication 2008c). The approach is problem-oriented: designers and users together compiled a list of priority problems that the GWP was supposed to address (3.2.6). Users implemented the technologies selected with advice from the designers. Over time the users re-inscribed some of the technologies: seed potatoes had become surprisingly popular and lucrative. During my field visit in 2013 almost the entire watershed was used for growing seed potatoes as they had become an important cash-crop. First concerns about diseases affecting the potatoes also emerged in the same year, as the farmers told me during a meeting. Users also re-inscribed the training as income generating activity – while some farmers during the interviews emphasized the skills they acquired, others hinted or said openly that they appreciated the additional income to be made by attending many trainings (through per diem payments).

The exclosure project prescribed Exclosure Management as the main technology for the project's script (3.3.3). This is a bio-physical technology that needs linkages with social processes in order to work: the crucial part is the protection of the exclosure by the users, which will only work if they have sufficient ownership over the exclosure as well as sufficient incentives to maintain the exclosure over a longer period of time (3.3.4). In spite of some linkages to social research methods, the exclosure project remained mono-disciplinary (3.3.3). It was to a limited extent participatory: the participation level was mostly limited to information and consultation, but to a certain extent some users were also involved in decision-making (3.3.6). Designers, stakeholders (*woreda*, DAs, church) and representatives of users (Watershed Committee, model farmers) negotiated on the exclosure area and place, and then informed the users, and the users agreed, at least during the meeting (3.3.6). The designers started the implementation, and the users engaged in labour (SWC structures, plantation and guarding).

The approach as such was problem-oriented (see 3.2.3 for framing of narrative), but there was no specific discussion with the users regarding their priority problems. The range of technologies applied was already closed at the stage of project planning: the exclosure project needed the exclosure for the bio-physical research, and part of the exclosure establishment was soil and water conservation construction and planting for land rehabilitation (AR, interview, 21.2.2011). Other technologies regarding fencing that were mentioned in the project proposal were later on abandoned – in personal communication AR told me that they were not feasible. After some conflict in the beginning, the users re-inscribed the exclosure as

a potential source of income, although in a different way from the original expectations of AR and his supervisor: during the interviews some users told me that the exclosure was appreciated for the payment for labour and guarding; the exclosure was re-inscribed as a potential site for economically valuable tree species (such as eucalyptus); and the settling of wildlife in the exclosure was welcomed as a new source of food. The latter two re-inscriptions were insights AR and his supervisor gained at the final project workshop with the users in Ambober in 2012 (pers. comm. A-Scientist 13.10.2012).

While the GWP was applied in an interdisciplinary way, the exclosure project was performed in a mono-disciplinary manner. There were differences in the actors at a national and international level (3.2.3 and 3.3.3, Appendices 3 and 4), but BOKU participated in both projects through supervision. The Austrian donor (KEF) was also the same, and therefore the project logic and valuation systems applied were similar. Both projects used the same format for the proposal and the logframe, and they had to follow the same guidelines for reporting. KEF specifies these as follows:

> The contents of the final technical report have to provide sufficient information on project performance and achieved outcome to enable a review of the results in line with project aims and planning, with special regards to expected results and the respective criteria and indicators. A detailed tabular financial report including invoices has to be provided additionally (see below).
>
> The following issues will have to be addressed in the report:
>
> - Achieved aims and results
> - Discussion about relevance of results and their contribution to the KEF-criteria
> - Indicators for project success with regards to project aims and expected results
> - Information about project specific publications and potential follow up projects. In all publications and the final report reference to financial support by KEF has to be given.
> - Status of partner (organisation) and scope for follow up projects, joint publications, participation in workshops and scientific networks…
>
> KEF funding guidelines according to KEF (2009)

The project reports to KEF were approved and published on the KEF website. The interviewed scientists described the success of CST1 and CST2 differently, and I also observed similar differences during my field work: while CST1 first had visible successes in terms of the implementation of technologies and the support of the users (3.2.5), a decline started shortly after project end. During my last two visits in 2012 and 2013 I observed the decay of some of

the structures that had been built and introduced by the GWP: a farmer meeting room was no longer maintained; one of the three cross-bred dairy cows given to the farmers had died already; and the community nursery was over-grown with weeds.

CST2, on the other hand, started with problems in the management of the exclosure and ended in a smooth stage (3.3.5): in 2012 the support for the exclosure was higher than at the outset as AR also documented in his thesis (AR 2012). CST2 was seen as successful by scientists interviewed because AR managed to build a good relationship with the users, and established the exclosure, while carrying out his bio-physical research at the same time. However, AR himself followed up on the project after his graduation and was himself critical of some of the developments after he concluded his research in Ambober. These issues were related to the management of the exclosure after project end: in spite of their good intentions to manage the exclosure by themselves, the users were initially not successful in arranging payment for the guard by their own initiative and the exclosure was no longer protected. Nevertheless, at the final meeting in 2012 many farmers attending the meeting expressed support for the exclosure. I participated also in a subsequent carbon compensation project funded by BOKU starting in 2013 in Ambober. During meetings this new project gained support by farmers in both Wojnie and Woglo who were willing to establish additional exclosures for this new project. During the meetings they often referred back to the exclosure as a positive example.

KEF as the donor was content with both projects: CST1 took place during my time as KEF coordinator. KEF regarded the project as show-case project, and GR received additional funding to organise a workshop with workshop proceedings that were published by KEF at the Austrian Academy of Sciences, and to produce a film for dissemination within Ethiopia. Most Ethiopian colleagues I was talking to were familiar with the work of GR in Galessa and regarded it as a best practice project. During the interviews with users in the GWP it turned out that in spite of a lot of initial praise for HARC from many farmers for implementing this project, a lot of farmers (including some of the same ones who praised HARC) were still waiting for benefits from the project. As documented in 3.2.3 the project had reinforced inequality to some extent, and ownership was low: technologies that were not directly related to income generation were abandoned, even tools given to the users for the community nursery had ‘disappeared’. The expectations on continued support by HARC were high.

Users at both sites ‘re-inscribed’ their own visions into the approach (Akrich 1992). Akrich (1992) compares the introduction of technologies to a film script (see 2.1.3) where users are

assigned roles, and a design is laid out that 'inscribes' a certain vision into a technology, that is then often 'described' by the users. Thus the original idea of the designers becomes displaced by a new script developed by the users – a technology designed for one purpose may then be used for another purpose the designers had never thought of themselves (Akrich 1992).

Regarding design and scripts the designers in CST1 firmly believed that the interventions were what the users voted for, and they were expected to manage the watershed in a sustainable manner. The roles 'inscribed' into the approach (Akrich 1992), and its inherent values, were persuasive. As the script described, modern technologies will be applied by farmers, the farmers will start producing surpluses, and at the same time the climate and the environment will be improved. All this happens with the help of the scientists and the extensionists. The farmers alone are assumed to be unable to achieve this on their own account.

In CST2 the actual 'technology' is much more straightforward than a whole IWM process, but the negotiation for an exclosure is more sensitive. Exclosures are difficult to negotiate as they always take something away before giving something back: i.e. before gaining income from the exclosure by use of wood and grass the farmers have to give up grazing rights and other forms of land use in this area. Therefore enrolling farmers for exclosures can be challenging. The role of the people was to stop using the land – no more tree logging, fuelwood or grass collection or livestock grazing. The trees, grasses and soil are represented by the designers. The trees and the grasses start growing; soil fertility is expected to improve. The role of the designer throughout the project duration is to ensure all this is taking place by paying a guard, and by convincing the people in a further 'participatory process' that this is good for them (the users). The users then develop bylaws that designate punishment for those transgressing the agreement, and finally they agree to maintain the exclosure and pay a guard out of the exclosure revenues themselves. There is an inherent morality in this approach that ascribes a role to the users that may be difficult to communicate: they should stop using a plot of land in order to serve the whole community in this area (reduced run-off and soil erosion, improvement of local climate, etc.) and, beyond that, the global community (environmental services, climate change mitigation). Their own benefits are not immediately visible – being able to buy or sell wood and grass harvested from this land a few years after the establishment of the exclosure is a promise but not a fact at the moment of decision.

The two case studies are different although related in the type of technology they have chosen; some of the actors are similar, but there are also different ones. The main differences

are found in the actual script of the project: the extent of technology involvement was different, as well as the definitions and roles of users, and the extent of their re-inscription of the projects' designs. Furthermore, enrolment and participation take place at very different scales in the two case studies. But in spite of the fact that a lot more resources went into participatory processes and farmers' involvement in the GWP, in the long run ownership was higher in the exclosure project.

3.5 CONCLUSION

In this chapter I have given an overview of the two approaches applied in the case studies. I have described how the scientists selected the place for their research, and how they have enrolled farmers to participate in their projects. Both approaches have different backgrounds but also many commonalities. A concept developed in one place is applied in another area, in this case two relatively remote areas of Ethiopia, with the hope of finding lasting solutions for the overwhelming problems scientists – embedded in particular actor-networks – see themselves confronted with. Due to the nature of the scientific apparatus, and the approaches themselves, the farmers are consulted after the main issues have already been agreed upon, in principle, by the scientists. The rest is participatory fine tuning where farmers as a group (or represented by some elected delegates) were consulted about what they wanted within the already given framework, or project script.

This is not to say that the scientists were not willing to change this situation, and to work with farmers on a more eye-to-eye level. Indeed, in those two case studies the two project managers really had honest intentions to do this. But in practice they were facing obstacles in doing so: language challenges (CST1), time constraints reinforced by the pressure of finalising the doctorate and the project almost simultaneously (both); local power dynamics impacting on the research (both) that were not sufficiently taken into account at the outset; and institutional challenges (3.2.2 and 3.3.5). The political system itself on the one hand encourages more participation and on the other hand also disempowers farmers and scientists alike and limits freedom of engagement. And lastly, the social system within the communities also puts some limitations on the operationalisation of their good intentions. First, when entering the communities, the scientists were confronted with an existing system of power structures partly reinforcing inequality and social injustice. Second, the scientists were forced to use existing institutions such as the government extension systems (i.e. the DAs) or the church, to communicate with the farmers, and this of course also had an impact on the subsequent communication with the farmers as it influenced how farmers perceived the

scientists. Third, the farmers had their own experiences from previous projects: the FARM Africa project that took place in Chilimo Forest was perceived positively by the farmers interviewed who were familiar with it; it also had a participatory component (CST1). In Ambober the joint forest project was a coercive reforestation project during the Derg Regime – but farmers did not comment much on it during the interviews. The existence of this forest was however seen in a positive light by many farmers living close to it. The experiences with the Austrian development project SRMP-NG were divided – some farmers were enthusiastic about it during the interviews, others complained that they felt excluded or that the project was not addressing their needs. At both sites many of the farmers had made experiences in previous projects: these (and other) factors beyond the control of the scientists also influenced the implementation of the approach, which by itself presumed a certain neutrality or positive attitude of those assumed to be 'waiting to receive help and assistance'.

Approaches such as IWM and EM are incredibly persuasive in both their complexity and their simplicity. And they also work – at least it is not difficult to present them as a success within a scientific environment – because, after all, the results and indicators of the project logframe have been achieved most of the time. In the case of the two KEF projects presented above, the latter was not entirely true: from the proposal to the report some changes took place. This was less so in the GWP but more so in the exclosure project. However, both projects were approved by the donor. The main criteria of KEF were scientific quality, relevance for development and sustainability. Both projects fulfilled the demands for scientific quality: this was also the easiest one to assess: the projects answered the research questions, and provided a report, a doctoral thesis and scientific publications as evidence for their scientific outputs. Relevance for development and sustainability were much harder to proof. When I started my research in 2009 I did not expect that the GWP would develop in the way that it did. At that time many farmers attended the meetings of the farmer research groups, many activities were still on-going and the community nursery was in a good condition. In 2013 the situation was very different – the scientists who previously worked frequently in Galessa had already started working elsewhere, and many activities that had been left in the responsibility of the FRGs or individual farmers were discontinued (3.4). There were no more time and financial resources available to continue the previous activities. But KEF (like other donors) wanted a report on the work achieved, and the state of the project at project end, also in terms of development and sustainability (see guidelines in 3.4). Yet, there was no specific question about difficulties, challenges, or expected problems in terms of the continuation of the work (or sustainability of the project's outputs) in the KEF guidelines. Primarily, the project was validated according to

scientifically acknowledged criteria (such as publications and conference presentations). The reporting format and the guidelines thus enforce the result-orientation of the project logic. This enables and leads project managers to report successful projects in spite of challenges such as the acceptance by local people or the local sustainability of the project. The ways the scientists had to write and present the projects was different from what they experienced in the field; and even a partly failed project could still have been presented as a success. The actual donor criteria had been fulfilled – but the more complex issues surrounding project implementation had been lost sight of. And given the criteria provided, it seemed that the donor was not even particularly interested in learning too much about those. (compare also Crewe and Harrison 2000; Mosse 2005 and others)

The frameworks provided by the approaches influenced the projects' script, particularly the role of users in the projects. In IWM there is scope for participation of users also in terms of decision-making, for example regarding the priority given to different technologies to be applied in the watershed. There is even a more specific approach called Participatory Integrated Watershed Management (PIWM) that was also applied in the GWP (although the GWP had its limitations in terms of decision-making, see 3.2.6). Exclosure management focuses more on the role of users as labourers, as guards and as committee members to regulate use, revenues and transgression of rules after the establishment of the exclosure. The designers of the project intended to involve users in decision-making at the outset of the project regarding the location and size of the exclosure. However, the designers then followed a routine of stakeholder consultation that focussed mostly on the powerful members of the community such as the DAs and the model farmers (3.3.3 and 3.3.6). The scripts of the case studies made it clear what roles the users should play. As the projects' scripts started to play out, those roles started to change: in CST1 more participation was made possible through the introduction of PIWM as originally anticipated; however, the local elites also appropriated a lot of influential positions within the GWP that prevented participation across the community (3.2.6 and 3.2.7). Similarly in CST2, the designers did not manage to achieve a sustainable consensus among the users at the outset of the project (3.3.6). In applying IWM and exclosure management as approaches the designers did not succeed in ensuring enough space for alternative views and opinions, even for considering the complexities of social worlds and identities. Rather than incorporating those, measures were taken to convince those who were deviating or 'not participating'. And it was difficult for scientists during such short-term engagements, and given the rigid framework of the approaches, to know who the people were they were working with. Thus, the scientists in the case studies ended up working with local

elites rather than involving a more differentiated representation of the villages.

Blaming the scientists personally would be an oversimplification. When it comes to the approaches themselves they are in their nature too rigid and too orientated towards a particular vision of success. The technology thus dominates over the user (Oudshoorn and Pinch 2003). Rather than trying to adapt to the farmer, it is trying to squeeze the farmers into the framework of the technology. The design of the projects is already clear before engaging with the user, thus the risk of missing the users' real needs and not meeting their ways of knowing is high. Frustration can arise among those who really wanted to make a difference with ambitious projects like the two case studies.

IWM that was first welcomed with enthusiasm was then abandoned with frustration by the users – only for the scientists to embrace a new hype with a different name, which promises to bring the solution to all the problems scientists and policy-makers in Ethiopia (and elsewhere) are expected to solve (see 5.4, workshop about 'upscaling'). Regarding the exclosure management in CST2 a follow-up project has enabled users to continue managing the exclosure (3.3.3).

Much depends on the farmers themselves, their experiences with outside interventions, their personal backgrounds, age, gender, position in the villages, and their freedom, potential and confidence to act to change their own lives. Given the history of suppression and institutionalised disempowerment in the Ethiopian Highlands, these are high expectations. Yet, the two sites showed a lot of difference in that respect. In Galessa in spite of (or because of) a long-term high presence of scientists with a high number of interventions, although with small horizontal effect within the community, the effects of the project were rapidly evaporating after the project end (3.4). In Ambober at least a group of farmers has developed a strong sense of ownership of the exclosure, and they received back-up in form of a follow-up project soon after the exclosure project terminated. Both the exclosure project and the new project are relatively low-impact, low-visibility projects, with small funding and few researchers actually present in the area. However, until now it remains unclear who those farmers are that are supporting the exclosure, and to what extent they are representing other people with perhaps different interests.

The next chapter therefore looks in more detail at ways of knowing of farmers in Ambober and Galessa. It shows the differences between individuals in their ways of knowing based on their

personal context. It explores how power dynamics and knowledge can become interwoven in the use of authority, language and symbols of power to exclude some people from technologies. A comparative section at the end also looks at both farmers' and scientists' ways of knowing as they encountered each other in the case studies.

4 WAYS OF KNOWING

4.1 INTRODUCTION

In this chapter of the thesis I look at how different ways of knowing are expressed in the case studies. These ways of knowing come with certain positions and narratives, and they also represent certain moralities and beliefs. Different actors show more inclination for some ways of knowing than for others, and this may be influenced by their social worlds and positionalities. Social worlds (Strauss 1978) help to explain the different socialisation of farmers and scientists. They belong to groups with different social backgrounds, different careers and different lifestyles. However, there is also some overlap between them, as many scientists grew up in a farming environment or live in such surroundings. Sometimes there is an overlap in their ways of knowing; sometimes there are contradictions. It is difficult for people to agree on knowledges because their knowledges about apparently the same things originate in different ways of knowing about them. Therefore when people from different social worlds meet it is not only a meeting of different knowledges and experiences, but also a meeting of different ways of knowing. Reason, emotion, language and other ways of knowing influence our lives every day, independent of our professional status as, for example, scientists or farmers. But depending on the social worlds we belong to, and our positionalities, we give priority to one way of knowing over another at a particular moment, and thus block out other voices and knowledges. Thus knowledge sometimes becomes linked with certain groups or a given 'community of knowers' (IBO 2008: 10) or communities of practice (Wenger 1998). However, knowledges may develop within individuals, groups or communities, or come from outside, and this is not always a conscious process.

This chapter provides examples from both case studies regarding different ways of knowing, and how social worlds and encounters influence the ways of knowing of different people and what happens with their knowledge. I want to highlight the role of alternative ways of knowing in people's lives. The chapter starts with sense perception, and then goes on to explore ways of knowing linked with spirituality, emotions and memories. As a next step the chapter looks at the role of languages, exclusion and authority. It ends with a comparative section about ways of knowing of farmers and scientists in the projects that I studied.

In this chapter I will talk about knowing from the farmers' perspectives. Therefore I will refer to the places they live rather than the case studies themselves. These are the villages Tiru, Sombo and Abeyi in Galessa (CST1) and Wojnie and Woglo in Ambober (CST2).

4.2 WAYS OF KNOWING IN TREE AND SOIL MANAGEMENT

4.2.1 SENSE PERCEPTION: DESCRIBING AND UNDERSTANDING TREES AND SOIL

Sense perceptions are guided through our physical abilities to perceive our environment, however different they may be for each individual. The focus on hearing rather than seeing or feeling rather than tasting or vice versa may also be influenced by different cultures. Social worlds also influence whether we appreciate such ways of knowing as something valid, and whether we are aware that this could be a salient way of acquiring new knowledge. The type of knowledge acquired with sense perception is also called *a posteriori* knowledge – it is tied to observations, experiences, things that we can see for ourselves (Williams 2001).

I found that *a posteriori* knowledge was important for farmers: many farmers emphasised during the interviews that they *know* things because they *saw* them or *heard* them. When talking about these ways of knowing, most farmers also made reference to their parents and grandparents, like this female farmer from Woglo:

> I learned from my mother and my father, they were farmers in their place. My father was a very strong farmer, and he was managing farm very good. One day he was trying to cover as much place as possible to plough the land, while he was not doing bunds or trenches. And when he is going back, because it was getting too late to prepare the soil bund, there was a flood and the flood took the soil. So he said that I am really sorry that I didn't do well. I am trying to cover much place while I am ignoring the important activity. The eyes are placed here for looking. You have to look seriously and you should have broad perspective. I have seen many things in my life and my eye is placed here just to look everything. And my ear is placed here to hear everything in this place. And people have to be conscious when they are living. (Female Farmer, 73 years, Woglo, 14.01.2011)

She reminds us that whatever we do, we must pay close attention to all factors influencing this particular activity. For a farmer this means that every activity must be seen in its context. Therefore looking at a farming activity from 'a broad perspective' is important. In this case her father focused on the wrong aspect: he tried to plough as much as possible in one day, and neglected another important activity, preparing the soil bund. And because he did not do this, all his work was in vain when the rain flooded his land and washed away the soil. Therefore the lesson she was taking from this experience was to look and hear to perceive everything that was important, and make conscious decisions based on that.

In Galessa I had an interesting conversation with a farmer about his ways of knowing. He lived close to the contact farmer, but he was not actively cooperating with the GWP.

> Birgit: How did you know how to plant and grow trees, at the Derg time. I have been told it was something new to plant and grow trees. How did you know how to do that at that time?
>
> Farmer: We know, we have our own knowledge. But at that time we don't have land that's why we didn't start before Derg regime. But we have indigenous knowledge how to plant.
>
> Birgit: How is this knowledge passed on from one generation to the next generation?
>
> Farmer: My children can learn from me, as I learned from my father. Because when I plant the tree, my children see how I plant the tree, and they learn.
>
> Birgit: How do you explain to your children what is important about trees? Why do you need trees?
>
> Farmer: Trees are our livelihoods. They are part of our life. We use it when we are living for housing, for fencing, for furnitures. Even when we die, we use wood for the coffin.
>
> (Farmer, 50 years, Tiru, interview, 8.5.2010)

In contrast to other farmers this farmer told me that the knowledge about planting trees was old knowledge. Others said that they had no tradition in planting trees, and that it was mostly due to the Galessa Watershed Project (GWP) that they started doing this. He also mentioned that the main reason for not planting trees was the lack of land for planting. The way he described how he had learned from his parents, and how his children were learning from him was similar to many other farmers: by observing what they were doing and by participating in the farm work – not as a conscious learning process, but as part of growing up, as part of life, shaped by their parents' ways of knowing and the social worlds they were born into. This can have a very emotional component, as I will explain in 4.2.3. A positive memory of a parent can also revitalise interest in certain knowledges at a later stage of life.

Table 4.1: Farmers' description of soil types.

GALESSA	AMBOBER
Black soil (found on steep land, susceptible to erosion) Red soil (is more profitable and fertile if you apply fertiliser) Soil around homestead more fertile (more manure, erosion problem on field because of slopes), may not need fertiliser Soil in the outfields shallow in depth, needs fertiliser Soil found in the forest areas more fertile	Red soil Black soil White soil Mixed type of soil (*serbolla*) Soil with many rocks (red soil) Soil mixed with sand In the hillside, not much depth (*gimma*) Soil where the stones will break and become soil

Another striking experience for me was when I asked a farmer in Wojnie about the use of rocky fields. He had been selected by the DAs as key informant, he was about 60 years old, and well known by outsiders coming to the community. I remember having had many conversations with my Austrian and other foreign colleagues about this kind of field. Such fields are hardly recognisable as agricultural plots and would not be considered suitable for ploughing in Austria (Figure 4.1). My senses were showing me a field of rocks, and I immediately made conclusions using my Austrian-socialised ways of knowing. But the farmers are not only ploughing fields covered with rocks, they even see a special value in them, as this experienced farmer made clear:

> It is important to have this stony land because in previous days we were not interested in this type of land. We were trying to concentrate on the other areas, which had black soil land and others which are free of stones. Now it becomes important because it can be helpful for construction of terraces and fences. Again, the stone will protect the soil from erosion. So this type of farmland is fertile since it is protected from erosion. (Farmer, 60 years, Wojnie, Village walk, 24.3.2010)

Figure 4.1: Field full of rocks in Ambober.

The farmer constructs a different meaning around the stony land: his representation of this land is connected to land use changes and soil and water conservation (SWC) technologies. In the past this type of land did not have a particular meaning according to him, but it has now become important: on the one hand because land has become a scarce resource with the growth of the rural population, the use of land for other purposes (settlement, land for investors etc., for more details see 1.4.3.4) and the need for higher productivity to feed Ethiopia's growing population (see also MoFED 2010); on the other hand the government has repeatedly prescribed the application of SWC technologies such as terracing since the Derg regime. And terracing in particular requires a lot of stones. The final aspect emphasises another side that has gained significance due to land shortage: the use of land that is endangered by erosion. This land potentially threatened by erosion is to some extent protected by itself, if it is stony land. The argument brought forth by the farmer in Wojnie (see above) was supported by another farmer in Woglo. He explained to us that the rocks conserved the soil moisture during the dry season. Thus they had had another important function for his farming practice. This type of *a posteriori* knowledge exists because of the

observations and experiences the farmers have made, and the value they ascribe to them in their particular social, political and historical context.

Table 4.1 summarises how different farmers described soil types during the interviews. To understand how they evaluated the type and quality of the soil on their land, I asked farmers to describe the soil in the field. They usually picked up a sample of soil in their hands and then described the soil. These farmers' differentiation of soils was based on productivity, colour and surface composition. Anything beyond that was highly specific to the locality. Their ways of knowing about soil were oriented towards senses and primarily observation. The analytic approach of scientists like AR-DS[15] to take a sample of the soil from Ambober to another place thus seemed strange to the key informant in Wojnie:

> There was a guy here, he took some soil from my land, but he has not come back to tell me the result. (Farmer, 60 years, interview, Wojnie, 10.3.2010)

The farmer spoke disapprovingly of this callous behaviour. As I observed during the interviews, it made some farmers suspicious if someone was taking soil from their land and they did not know what would happen to it. Several farmers complained that in many cases scientists and other outsiders never returned to share their findings with them. The following two farmers, both model farmers, seemed to have more interaction with AR-DS than the previous one:

> Farmer 1: There was a guy who told us he came from Austria and he was taking soil from different farmlands last year.
>
> Farmer 2: We have seen that he collected different types of soils from the upper catchment and from the lower catchment. He said that these different types of soils have different nutrients which can help the plant to grow or to give fruits. He told also that if you keep your farm with terraces, you will find those different nutrients which help the plant to grow and to give fruits. He showed us depleted land and told us that it will take at least ten years to bring back that land to fertile.
>
> (Farmers, FGD, Wojnie, 30.11.2010)

While some farmers like the one above were not informed in such detail by AR-DS about his work (even though he took samples from their land), these two had a much clearer idea about what he was doing. According to these farmers, he explained his work to them and also brought their attention to the soil degradation narrative (1.4.3.1), as well as recommending them the use of terraces as prescribed by various government policies (MoFED 2010,

[15] AR-DS was one of the doctoral students working in Ambober at the time of my research. See also 2.2.1.

MNRD&EP 1994 and others). Like AR and GR[16], he did not have access to the wider community of farmers; his communication was limited to a group pre-selected by the DAs. As I learned from AR, GR and their colleagues at their research institutes whom I interviewed, the DAs were key figures for them in establishing contacts with farmers. This gave the DAs the power to decide which farmers would be introduced to the scientists. As I observed, in Ambober the other (not selected by the DAs) farmers had little opportunity and few incentives to approach the scientists themselves. In Galessa this was different, as due to the long period of cooperation many farmers had already seen the scientists from the Holeta Agricultural Research Centre (HARC) coming and going (for more details about HARC see 1.4.5 and 3.2). During the interviews many farmers told me that they knew scientists from HARC, and that they would approach them to ask advice on technical issues if they met HARC scientists in Galessa. However, many complained during interviews that those visits decreased in frequency and ceased almost completely after project end.

During the interviews farmers, male and female, most often referred to the soil in relation to crop productivity or SWC. I tried to find out how they differentiated good and bad soil, and how they came to know this. The latter question was, however, difficult, as the most frequent answer was 'I KNOW this!' Explaining their ways of knowing, which they seemed to take for granted, was not always easy for the farmers, especially for some women who were less used to being asked about their knowledges. This example shows how my question did not lead to anything, while my translator managed to change my question more successfully:

> Farmer: The soil type in this area is very good. It is good for every crop. It can produce the majority of crops which we know.
>
> Birgit: How can you tell good soil from bad soil?
>
> Farmer: I know that.
>
> Habtamu (translator): If you move towards your market place or church, you will look at different farm lands on the way. So what a good soil looks like and what a bad soil looks like?
>
> Farmer: I can differentiate between good soil and bad soil. The black soil has a very good soil cover and depth, it is easy for penetration when we are ploughing, moisture will stay with the soil and it is not dried quickly and it is comfortable for producing crops. But when

[16] GR is the project leader of CST1 in Galessa, therefore I called him 'Galessa Researcher' (GR) in this thesis. AR is the project leader of CST2, working in Ambober, hence I gave him the name 'Ambober Researcher' (AR). See also 2.2.1.

> we look at the soil in the highland areas, they are mixed with sand, and it is not good, it has no depth, and it looks not mixed. You can see easily the sand and the soil.
>
> (Farmer, 74 years, Woglo, interview, 11.3.2010)

Here my translator found a good way to move closer to the farmer's way of viewing the world: he referred back to his senses, his vision and observations. This farmer clearly had a detailed observation of the soil, and he could differentiate by looking at the soil whether it was good or bad for production. He was probably older than he told us, and had a lot of experience. He was also the father of our key informant in Woglo. Other examples where farmers explained different aspects of farming to us in their own ways can be seen in Figure 4.2 - 4.5[17]. Figure 4.2 shows Ato[18] Yeneh who walked around his homestead garden with us (my translator and me) during the interview. The photograph shows how he points out the regeneration of *gesho* to us. While sitting around his house, he did not mention much of the work he was doing with trees in his homestead, but when I entered his homestead garden he showed me many different tree species, and also how he was propagating trees. Like Ato Set'Eng (Figure 4.3) he is growing *gesho* from the seeds he is collecting from the fruits of *gesho*. After germination the young seedlings need protection. They are usually grown in a small circle, protected by stones around them. Additionally Yeneh and Set'Eng also put branches of thorny bushes on top, so that grazing livestock cannot eat the fresh leaves of the seedlings. Both farmers, one among the poorer farmers, the other among the wealthier, but both of similar age (between 40 and 50 years old), were propagating different tree species in their home garden. Ato Set'Eng was growing more different trees. In addition to *gesho* and eucalyptus, he also had *shiwaha* on his land that he grew from wood cuttings, as well as *kinchib* and others. Both Yeneh and Set'Eng were from Ambober. Ato Set'Eng often invited me to share *bunna* and food in his home, and we had many long conversations about agriculture and life in general. However, like Ato Yeneh, he expressed much more about his knowledge when we walked around his homestead or around Woglo and its farming land. This was also true for one female farmer I met in Woglo. She was about 60 years old and lived close to some forest patches in Woglo. She was known for protecting trees and for her in-depth knowledge on trees, but she was also a good farmer. She was one of the few farmers who mentioned crop rotation on her land, which she

[17] I am mentioning their names here because I am showing their photographs. I would find it disrespectful to show their images without mentioning their names. When quoting the same persons from the interviews and other interactions, I abstained from mentioning their names.

[18] 'Ato' is an expression for 'Mr.' in Amharic.

considered very important. She was involved in every farm activity except for ploughing, and she was trying to share her experiences with others:

> Let me tell you an experience I had before. When we were spraying the herbicides, when my son was spraying the herbicides in a row, he forgot one row, and in the next day, when I went to the farmland and I pick up the weeds destroyed by the herbicide. I looked at difference in the soil. It was red normally. And the one sprayed by the herbicides becomes black while the other he left without spraying the herbicides stays red. So I believe this herbicide is not important and it is dangerous for the soil cover. When I told to the people and I show up the area to them, people become surprised. (Female farmer, 60 years, Woglo, interview, 11.3.2010)

She observed an unusual effect of the herbicides on soil, and immediately understood that this herbicide had a bad side effect. And she showed this to other people, who by seeing this became surprised. This process of seeing, understanding, and sharing with others who can see the evidence themselves is important: many farmers also mentioned during the interviews that they learned a lot from their neighbours, by looking at what they were doing and talking to them about this.

In the study area of Galessa I also met many farmers who were propagating and/or growing different trees in their homegardens. There was Wäzero[19] Workitu (Figure 4.4) who was growing a large variety of different trees and bushes. She sold her products on the market, and she was particularly successful in selling different spices and herbs. While talking to her in her home, I was not aware of the wealth of trees and other plants she was growing – only when she took me to her garden she revealed the diversity of her knowledge and practices. And there was Ato Kumela Gebisa (Figure 4.5), who has managed to regenerate different tree species in his garden. Ato Kumela even regenerates *heto*, a rare endogenous tree species that is difficult to regenerate according to the HARC scientists I spoke to. In fact the comparison between *heto* in Ato Kumela's homestead garden and the community nursery also revealed that he was doing this much more successfully. Like the others, he did not mention this to me until I walked around his garden.

These farmers above are some selected examples only. I selected them (and others in this chapter) because they were among the ones who left the deepest impression on me – because

[19] 'Wäzero' is an expression for 'Mrs.' in Amharic. Like 'Ato' I am also using this for the Oromiffa-speaking farmers because I spoke Amharic with them. My knowledge of Oromiffa was unfortunately limited to greetings and thanks.

of their knowledges and experiences, but in some cases also because of their personal fates and how these influenced them.

Figure 4.2: Ato Yeneh in Woglo shows how he regenerates *gesho* under protection from browsing livestock.(CST2, Ambober)

Figure 4.3: Ato Set'Eng in Woglo explains the propagation of *gesho* and shows us the seeds of *gesho*. (CST2, Ambober)

Figure 4.4: Wäzero Workitu shows us her amazing homestead garden full of pride. (CST1, Abeyi in Galessa, but outside the watershed)

Figure 4.5: Ato Kumela has managed to regenerate *heto* (*Hagenia abysssinica*) in his homegarden. Here he shows us how he collects the seeds from the flower of heto. (CST1, Abeyi in Galessa, but outside the watershed)

There were many other farmers at both sites where I made similar experiences and observations. When I asked these farmers how they came to know how to manage their homestead gardens and their land, the farmers mentioned above as well as others would answer that they learned this either from their parents and grandparents or by themselves. A lot of these knowledges were thus transmitted, or emerged from their own observations and practices. This was also asserted by the farmer below, a 45 year old model farmer, member of the Elder's council (*shimagelle)* and chair of a *Senbaté* group.

> Birgit: There are lots of *gesho* trees in your farm. Did you plant them yourself?
>
> Farmer: Yes. I planted all these *gesho* trees by myself. I know how they are important for me, be it *gesho* or *weira*, they are important for us. My children are now in school and it needs money for their clothes, books, and a house rent especially when they join their high school. I sell *gesho* to the market and cover the expenses for my children. *Weira* is also

> important for me to prepare farming tools. In addition, the forest cover gives a grace for the village and it looks nice especially for those coming to visit our village. The government has given a direction for us to cultivate trees and protect the forest from being cut by the people and I am trying to protect the forest just beyond my homestead. The forest area also helps to protect the flood from coming to my house from the mountain. I am planning to plant some more *gesho* trees and trying to protect the forest land in the side of my farmland.
>
> (Farmer, model farmer, 45 years, Woglo, interview, 14.1.2011)

He gave many reasons for planting trees on his land: first of all he mentioned the income he was making that was needed to send his children to school. This means that he had less labour available for livestock. I was told by the farmers that either they sent their kids to school, or they stayed at home as shepherds, and to help with other works on the farm. But *gesho* is a profitable source of income and he used it to pay for his children's education. He was a model farmer, and he had enough land to be able to set some aside for trees and bushes like *gesho*. Another tree function he mentioned giving the example of *weira*: he said that the wood of weira was hard and long-lived, therefore it was good to make farming tools, and the trees themselves were beautiful and scenic. In fact the area around his house seemed very idyllic – his house was located at the bottom of a steep hill covered with *weira* and other trees as well as different bushes like *agam* and *kaga*. In protecting this land from being deforested he was not only protecting his own house (see also quote below), but also the land below his property. There were several farms in similar locations, which fulfilled similar functions. However, those I interviewed among them were all wealthy farmers who were not in need to gain income from the trees on the hillside – but this of course does not mean that they do not use trees as well. As a model farmer, he had close connections to the DAs and other government representatives coming to the area. He got access to training and new technologies before other farmers, who were not model farmers. To find out more about how he got his knowledge – apart from what he learned in the trainings he attended - I asked him to explain how he knew about trees and their roles and functions.

> In the previous days, our grandparents have had a big forest. I know a dense forest when I was a kid and growing up in the village. I saw when my father was planting trees and managing it to grow by protecting it from livestock from grazing. I usually watch radio since the time I was a kid from my father's house. What the radio is saying? A farmer should dig a place to plant trees in February and March for the rainy season planting. What does it mean? That place will be exposed for air, sun and rain which helps for the plant to grow in there. I never water *gesho* seedlings in my life. I just dig the hole in February and March and let the hole to get air, sun and the flood will stay in the hole that makes the soil get enough water. After I plant the seedlings, I will not water it since I allowed the flood to come into the hole in the preceding months and the water will stay and help for the growth of the seedling. […] Regarding *weira*, if the area has no forest, there will be no rain and we all will

> die. Forest is life for the farmer. […] I have never gone to formal school while I can read and write since I got some informal education. I know the benefits of the forest. The rain will only come or it will be normal if there is forest. Bees will not be there is there is no forest area, the flood will directly come to my house and may destroy it if there is no forest just above to my house.
>
> (Farmer, model farmer, 45 years, Woglo, interview, 14.1.2011)

He explained how he *observed* the forest and his grandparents' and parents' work with trees. Additionally he *heard* from the radio how to manage forests, and why this was important. This gave him important insights that saved him a lot of work later on. Other farmers complained to me about the additional workload of watering seedlings. This particularly affected women and children who were responsible for such kind of work. He explained what he knew about other functions of forests in addition to protection from erosion, and emphasised that he did not learn these things through formal education. As a wealthy and model farmer he had more access to information and more land than others. Thus he was not facing the constraints of land shortage and the lack of access to agricultural inputs to increase the productivity of his land that other farmers were complaining about in the interviews. The powerful position that he had in relation to the government and to the other villagers through his political connection, as well as his multiple functions in social institutions in the village, further privileged him over others. However, this did not mean that a less powerful and less wealthy farmer necessarily had less knowledge. Poorer and less powerful farmers also reported that they learned different land management practices from their parents and grandparents through observing, and listening, and they received instructions from the government on how to manage the land. However, they were in a less powerful position to resist what they were being told to do, and they often did not get the necessary inputs to implement what the government (represented by the DAs and the *woreda* extension officers) was telling them to do. This was reflected in this statement by a poor farmer from Woglo, he was about 50 years old:

> Farmer: We used to have cow dung in our homestead, because we know that our parents were doing that. The people who are selected from the farmers' association they told us to apply compost by collecting the cow dung and other things on our farmland because the fertilizer becomes expensive, and it is difficult to get fertilizer. They told us to use this compost that is why we are using it. Regarding to the soil, we are ploughing against the slope to reduce the speed of the erosion. And it is difficult to protect the flood through ploughing, so that we add stones with some distance, to protect from the flood. We see that some of the soil is protected and that area is very good. So we know it is very important. And now the government was telling us last year to construct terraces on the communal grazing land. And we are constructing terraces, even though there are people

who are constructing terraces on their farmland and there are people who are not constructing terraces.

Birgit: So why are there some people constructing terraces and others are not?

Farmer: There are people who have a lot of labour, and they can work whatever they have to. But there are people who have limited labour, and for example if you take me, I am the only one working in the farmland, so I will try to protect the farmland, but it is difficult to construct like those people who have much labour.

Birgit: How does the amount of labour vary so much?

Farmer: Family labour. They do have many children, so that they can work together with the children.

(Farmer, 50 years, Woglo, interview, 30.6.2010)

Like the wealthy farmer above, he does not have labour on his farm, but while the rich farmer can afford to hire workers, he cannot do so. In the beginning of his statement above, he refers to 'they told us to…' several times. He has his own farm; however still I got the impression that he was not free to decide himself how to manage his farm. Like other farmers of comparable status regarding wealth and landownership he was telling me that he implemented a technology because 'he was told to do so by the government' - he was not doing these SWC activities by his own initiative. And as mentioned earlier (1.4.3.3) it was common in the Ethiopian Highlands, that SWC activities were implemented by the initiative of the government (or development projects), but the terraces and other constructions disappeared soon afterwards. I already discussed this issue in 3.2.4 – farmers disapprove of some of the measures applied as their predicted benefits contradict their own knowledge and experiences. Many farmers in Ambober expressed scepticism for terraces due to the high rat infestation in the area. Terraces were seen as an ideal hiding place for rats.

Farmers' knowledges and their ways of knowing through sense perception in Ambober were influenced by their individual histories, and it was not possible (and meaningful) to classify them as a group of knowledgeable and less knowledgeable people, depending on the social stratification of the villages. The causes were rooted in their individual situations, such as access to labour, their position in the political system and the location of their land. These and many other factors influenced how they came to know about tree and soil management, and what they did with this knowledge. For example, the farmer mentioned above had knowledge about trees, but he could not plant eucalyptus because of termite infestation. He had limited farmland that he needed to produce crops rather than trees. But still he believed that trees

were important, and as I could see during a visit to his homestead, he was growing many different trees there.

> Farmer: I am not planting trees, but I am protecting trees which are grown by nature. And I do have *wanza*, *misanna*, *weira*, *endod*, and *grar*, and *kinchib* which I am protecting them from livestock grazing when it is young.
>
> Birgit: And why are you not planting yourself?
>
> Farmer: I was trying to plant eucalyptus before, but because of the termite problem in the land, it is difficult to reach to production stage. So I am just dropping to work on it. I have limited farmland, and it is given for the crop production, and I don't have suitable land for the production of trees.
>
> Birgit: What are trees good for?
>
> Farmer: Trees are very important, they can be used as a shade for the people or for the livestock. And it can protect everything; it can protect us from wind. And the leaves of the trees are very important, especially in the dry season, for livestock.
>
> (Farmer, 50 years, Woglo, interview, 30.06.2010)

The model farmer mentioned above provided another account regarding trees:

> In recent days we and the government are trying to protect the natural forest from being cut by the people which let the area to be a desert. The primary focus is to conserve the natural forest and protect from the people. In addition to this, we can get eucalyptus tree seedlings from the multiplication center. We can even mix the natural forest with eucalyptus and some acacia seedlings which are distributed by the government. […] For strong farmers, it becomes easy to get technologies which can help to improve the productivity of his farm. (Farmer, model farmer, Woglo, Interview, 45 years, 14.1.2011)

Several time during the interview he referred to the deforestation and degradation narrative (1.4.3.2 and 1.4.3.3), that he did not question for its validity. As he said himself, for 'strong farmers' like himself, model farmers, it was easy to get technologies from the government. But the reports of other farmers during the interviews have shown that this is not the case for all farmers. Other farmers expressed concerns that they were excluded from getting technologies. While he finds it easy to get seedlings from the government's multiplication centre, other farmers complained that they could not get those. This could be a reason why some farmers told me that they found it easier to increase farm productivity than others – however, the availability of inputs is only one of many influencing factors. The examples above show that there are many influencing factors such as labour, land, natural conditions (termites), and above all individual life situations that influence what farmers know, and how a farmer can implement what he or she knows.

4.2.2 Exploring Spirituality, Emotion and Memories

Spirituality, emotion and memories are the most controversial ways of knowing among those I want to address in this thesis. They were seen as controversial by many of the scientists I interviewed. They gave priority to observation and experiments (as in empiricism) as compared to less tangible epistemologies not based on sensory experiences. Kuhn (1996) calls such concepts omnipresent in science history 'paradigms', and he claims that such paradigms gain power through the support of the scientific community itself and the textbooks and publications circulated to manifest certain arguments (Kuhn 1996):

> Those texts have for example, often seemed to imply that the content of science is uniquely exemplified by the observations, laws, and theories described in their pages. […] If science is the constellation of facts, theories, and methods collected in current texts, then scientists are the men who, successfully or not, have striven to contribute one or another element to that particular constellation.' (Kuhn 1996:1).

What Kuhn (1996) calls 'normal science' is 'the activity in which most scientists inevitably spend almost all their time' and it is based 'on the assumption that the scientific community knows what the world is like' (Kuhn 1996:5). Seen from that viewpoint, the acceptance of alternating world views, where people gain knowledge in different ways that are neither rational nor experiential, is challenging.

This issue has been taken up by feminist sciences. Tew, Gould, Abankwa et al. (2006:8) explain that 'The exclusion of women from science was a matter of power as their own discourses and knowledges were undermined and denigrated. It was then argued that women's knowledge, stemming as it does from a different position in society, needs to be re-instated as valid and powerful.'. Those in power, people powerful because of their gender, political affiliation, wealth, ethnicity, etc. have different life experiences than those excluded or oppressed (Tew et al. 2006, Harding 1987 and 2004). People with such experiences will also have 'greater knowledge about certain realities that those in positions of relative power and privilege cannot easily know about in the same way, because they lack that life experience. This can be knowledge of 'what is' and also knowledge of 'what is important' […] (Tew et al. 2006:8). Spirituality, emotions and memories are such kinds of knowing that are not accepted as valid by dominant epistemologies. Pyne Addelson (2004:165) describes the more generally accepted understanding of what 'valid' ways of knowing are:

> We believe that the methods of science are the most rational that human kind has devised for investigating the world and that (practiced properly) they yield objective knowledge. It seems to us that because there is only one reality, there can be only one real truth, and

> that science describes those facts. Our teachers and our texts affirm this authority of scientific specialists. […] Specialists have, rather, an epistemological or cognitive authority […] Science is supposed to be distinguished from religion, metaphysics, and superstition because its methods require criticism, test, falsifiability. (Pyne Addelson 2004:165)

Equally for some of the scientists I interviewed science was logic based and excluded religious aspects:

> Maybe without logic, you cannot make it science. There must be logic, because if somebody tells you that this is, this is given from heaven, if you cannot reach that through some logic, it won't be science. (E-Scientist, interview, 29.10.2009)
>
> Scientist: I think science, everything is science. Everything we want to research, analyse and question yourself is science. Be it complicated or not.
>
> Birgit: And what is not science?
>
> Scientist: For example, religious aspects are not science.
>
> Birgit: Because...
>
> Scientist: Someone told me this is religious, God, you don't have to search to know the reality. As to me.
>
> (E-Scientist, interview, 3.11.2009)

The argument of the Ethiopian scientists above is that on the one hand science is seeking to establish knowledge with certain methods, and by logical thinking. On the other hand religious aspects, and everything coming from God, is not open for questioning in their understanding. Thus it is not derived from logic, and it cannot be exposed to scientific scrutiny, as it must be accepted as it is.

4.2.2.1 Spirituality

All three ethnicities in the case study sites were monotheistic societies, and God played an important role in their world view. For the Oromo this God or Heaven is represented by *Waaqa*. *Ayyaana* is 'that which exists before and after, that which it causes to come into existence.' (Megerssa 2005:69), the 'principles of nature' (Kassam 1999:489). *Uumaa* is the 'physical creation' (Kassam 1999:489), a concept that 'refers to the entire physical world and the living things and divine beings within it, animal, vegetable, mineral and spiritual.' – in short, it 'refers to everything that is created'. (Megerssa 2005:70). *Saffuu* is then 'the way in which life can be best lived within the context of Oromo world' (Megerssa 2005:70), or the 'moral order of culture' (Kassam 1999:489). Megerssa (2005) explains what this means for knowledge in the Oromo world view. As his teacher Dabassa Guyyoo told him,

> "knowledge has flesh; knowledge has bone and knowledge has blood. The knowledge of the world as sensed through the flesh is physical knowledge: it is the knowledge of *uumaa*, of the created world. The knowledge that is felt through the bone is knowledge of the inner qualities of things; it is the knowledge of *ayyaana* or the cause of creation. The knowledge that comes through the blood knows the moral values attached to things; it is the knowledge of *saffuu*, of the right and just path. This is sometimes referred to as *qalbii*, 'thought'. A wise man is not a person who merely knows; it is rather a man who lives his knowledge." (Dabassa Guyyoo quoted in Megerssa 2005:70)

This world view and system of knowledge is not easy to understand for the non-Oromo – another complication is added by the fact that the Oromo system of knowledge cannot be understood by looking at its parts, neither by only looking at the whole without analysing its parts (Megerssa 2005). Furthermore, '*ayyaana* operates at many different levels of reality and applies to different kinds of phenomena, many of which are religious and/or philosophical in nature' (Megersssa 2005:71). A fundamental aspect of the Oromo system of thought is the connection between thought and the object of thought; knowledge, and knowledge about knowledge (*saffuu*) (Megerssa 2005).

In a country with such a long history of oppression it is not surprising that people were particularly hesitant to share details about their spiritual and religious believes with outsiders like my translator and me – this applied to both regions where I was working, but more so in Oromia region. A report by the International Crisis Group (2009) remarks, that 'The ruling party's monitoring has contributed to a climate of mutual distrust in central parts of the country.[217] People have become extremely reluctant to discuss views in public.' (International Crisis Group 2009:19). The footnote in the quote specifies that they refer to Oromia and Addis Ababa region.

During the interviews many simply repeated knowledge obtained from HARC training, or the achievements of HARC in Galessa, and it was difficult for me to move beyond this topic. However, at the same time I got intrigued by some other aspects of Oromo culture in Galessa, the culture of *adbar* and the Qallu. In Galessa the farmers claimed to be Orthodox Christians, but their own ancient religious tradition was still much more present. And this tradition also has a symbolic connection with trees (*uumaa*). Remnant trees or small forest patches called *adbar* are the sites for spiritual meetings and social gatherings (Figure 4.6). *Adbar* have a special status and the trees there cannot be cut (see also 3.2.1). Often these occur together with big rocks, but they are also found just next to farmhouses. In that case there is usually a small hut built next to the *adbar* that is called Qallu in reference to a spiritual tradition of the

Oromo in Galessa. While *adbar* is a sacred site used for ceremonies at certain times in the year, the Qallu is home to informal spiritual gatherings all year.

Figure 4.6: *Adbar* in Sombo, Galessa.

> We are using this tree as an *adbar.* [it is standing next to a Qallu house] This [Qallu] is the place where we pray to God. And we will have a coffee ceremony there, and incense, and we will pray to God. (Female farmer, 60 years, Abeyi, interview, 10.5.2010)

The celebrations in the *adbar* take place at times of year that are connected to agriculture; for example, in November the prayers are to avoid frost, and in May it is prayer for the coming rains. While these holidays are still observed, it was not clear to me how big a role Qallu and *adbar* play in people's lives and their ways of knowing. There was a contradiction in how they were celebrating and maintaining Qallu culture, and how they described it to me: it was omnipresent in social life and it played a role in tree conservation of otherwise rare indigenous species. Yet when I tried to find out more during interviews, when I talked to the farmers informally after the interviews, or when I asked the farmers I already knew better, like the local contact farmer or the local project coordinator (see 3.2.6), they did not give me clear information about *adbar* and Qallu. They started laughing, and said this is something we inherited from our forefathers; we do not know why we do it like this. According to Kassam (1999:490), 'it was the *qaalluu* religious institution of hereditary leaders that represented the fixed centrifugal force around which the changing, centripetal movement of the elected *gadaa* political leadership revolved.' Kassam (1999) mentions several specific examples of trees that played an important role in Oromo rituals.

The Qallu leader, who is a respected man in the area, lived in Abeyi at the time of my research, but he was not available for an interview. I was told he was too old and too sick to talk to us. Finally the contact farmer explained to us that the Qallu were actually a separate tribe:

> The Qallu are actually a tribe (gossa) by itself. Abitschu is the name of the main tribe in the area. They are a big clan, all over Showa, and also Addis Abeba. So NN tells us that these Qallu settled here, and declared themselves to be spiritual leaders. They gather a group of people around them as supporters, and compete against each other. So one claims to be more powerful than the other. They also receive in-kind contributions and support by the people. But in fact they are very poor, compared to the other people. (Field notes, 3.5.2010)

The Qallu in Galessa apparently were involved in struggles for spiritual domination. Nowadays however many of the Qallu are community members living in peace with the others, for example the aunt of the farmers who gave us this information is holding Qallu ceremonies herself.

The practice of celebrating ceremonies at *adbar* is common across the community. Yet there is some change in this tradition. Some of the *adbar* places nowadays have been replanted with eucalyptus. The old trees die and are not replaced. An *adbar* can be used for grazing, but the people emphasised that one is not allowed to cut a tree from an *adbar* place, or to use the wood for anything except for cooking during the actual ceremonies. Furthermore it was not common practice to plant new trees there. It was a place without management.

> Even if this tree will fall down by itself we will not replace it with other trees but the place is respected, no one can touch it. We call it adbar, and we respect it. (Farmer, 43 years, Sombo, interview, 11.5.2010)

In the surroundings of the villages of Galessa that I studied there are virtually no trees and forests left. The only places – except for a few homestead gardens - that provide a refuge for rare tree species are the *adbar*. Thus they are important biodiversity hotspots in a landscape otherwise void of such species. The *adbar* therefore play not only a spiritual and aesthetic role, they also provide a source for tree regeneration as seeds can be obtained from those trees. If those sites had already been lost, the knowledge about those trees would have vanished with them.

Adbar are also sites for rituals and prayers, as explained above. For rain, good harvest, but also in case of natural disasters people will pray and perform rituals and sacrifices. *Waaqa* defines the nature of plants, animals and human beings, and only by conforming to the norm given by *Waaqa* can they attain their individual destinies (Megerssa 2005). Even natural catastrophes represent 'the manner in which He has chosen to keep the whole together' (Megerssa 2005:76). It thus makes sense that the people in Galessa are using *adbar* for praying to their God regarding frost, rain and other natural events that cannot be influenced by human beings.

The Qallu usually own a hut in their homestead garden or an *adbar* adjacent to their house. I asked some of the Qallu how the meetings work. They explained to me that the hut is the place for the meetings. During these meetings there will be coffee ceremonies, and people will exchange information. There are prayers, and at the ceremony the Qallu is performing the

prayers. During the prayers the Qallu (who can be male or female) enters some state of ecstasy to lead the prayers, and the others will join in. The Qallus emphasised that these meetings are for people to come together and socialise. The place of *adbar* on the other hand has functions without meetings:

> On the way back from Abeyi we saw another *adbar*, it was a small fenced area that contained an ancient tree trunk. Behind it another tree was planted, and some clothes hung on it. Apparently the clothes were put by someone who was attacked by someone, or if something was stolen, so that God would punish the thief. (Field notes, 25.1.2010)

Even though other farmers said that *adbar* will normally not be replanted, this *adbar* had a new tree growing behind the old trunk. This *adbar* was also used to ask for revenge for something that happened, for example an assault or theft. A similar wish was expressed by the community during a meeting of the nursery group:

> All gathered once again, sitting on a slope, saying some kind of prayer. One young woman had lost 100 Birr during the work and so they were now putting bad spells on the person who did it. For example if it was a woman, she should be infertile from now, and things like that. (Field notes, 8.12.2009

These events and statements by the people were hard to understand for me. Especially the latter one, because it was clear that if there was a thief, this person was still in the crowd. There were about 50 people participating in the meeting. But it reminded me of what Dabassa Guyyoo told Ato Megerssa, and I repeat it here because it is so essential to understand the ways of knowing of the people in Galessa: 'The knowledge that comes through the blood knows the moral values attached to things; it is the knowledge of *saffuu*, of the right and just path. This is sometimes referred to as *qalbii*, 'thought'. A wise man is not a person who merely knows; it is rather a man who lives his knowledge.' (Dabassa Guyyoo quoted in Megerssa 2005:70). The farmers know why they have Qallu and *adbar*, and for them it is a fact that does not need further explanation to outsiders. They are institutions that help them to keep the community together, to address *Waaqa* to ask for help with rain and climatic conditions for agriculture, and to participate in spiritual gatherings that enable them to connect with their ancestral past. These are all connected to ways of knowing – community meetings are places where knowledge and experiences are exchanged in informal ways; prayers are helping people to know what is wrong and right (*saffuu*), and thus support people in decision-making. This is perhaps comparable to the use of intuition, listening to one's inner voices. And the prayers mentioned above also serve to bring things back into balance, to put things right, after injustice had been done. Things are all connected, and they are connected in a flow. This circle of life is also clear from the statement of a 57-year old farmer in Tiru. He told me that he is

more interested in soil than in trees. He was one of the farmers who had attended several HARC trainings, and he knew many of the HARC scientists.

> Soil is soil. Soil is a matter from which human is made from. You come from the soil, and you will eat this soil, and you will go back to be soil. (Farmer, 60 years, Tiru, interview, 27.01.2010)

This statement is in line with the definition of *ayyaana* quoted above. The soil is there before and after, and it is part of how human beings come into existence. It shows how deeply the Oromo world view is embedded in his understanding of his environment, in particular his understanding of soil as an essential component of human life.

Figure 4.7: Church forest in Wojnie, Ambober.

In the Amhara world view the Ethiopian-Orthodox Church (Figure 4.7) plays a dominant role. However, there are still other beliefs existing at the same time that are officially not accepted by the Orthodox Church: there is the belief in the evil eye (*buda*) (Reminick 1974) and the evil spirit (*zar)* (Young 2009), also held by the Qemant (Gamst 1969). The *zar* cult focuses on sicknesses that are caused by evil spirits (Young 2009). The evil eye is attributed to different groups of people, for example metalworkers such as locksmiths. In Ambober several farmers made derogatory remarks about the Falasha during the interviews. This may also have to do with the fact that the Falasha were practising craftwork that was shunned by the Amhara and Qemant, for example metal works. Another incident where the evil eye can be activated is when someone is eating alone in front of other people. One time when I was feeding my son a friend was visiting us with her daughter. As I was very busy with my son, I forgot to invite them immediately for food and drink, as would have been the custom. When my son got sick in the night, my friends got very frightened as they believed this was due to '*buda*'. It is not allowed to eat in public in front of others who are not eating - the other people might perhaps be hungry - this would then invoke a curse on the one eating alone that can even be deadly.

Intermingling religion (Ethiopian-Orthodox) and supernatural believes is also common among the Qemant:

> Economic and religious activities of the Qemant are interdependent, as the examination of their ceremonial calendar will show. All Ethiopian peasants and tribal peoples use

> supernaturalism to supplement their technological control of the environment, but the distinctive elements of Qemant religion set them apart from their neighbors and bind them internally. The fact that the ceremonies are held in groves of trees also makes the rites, and the Qemant performers of them, distinctive in the eyes of other peoples of northern and central Ethiopia, who say the Qemant "originated in wood [timber]" and "hold secret rites in groves of trees." (Gamst 1969:86).

Thus supernaturalism has its purpose in the way farmers are managing or controlling the environment. Gamst (1969) explains how the economic activities of the Qemant are aligned with the religious events of the year. This was also the case in Ambober. The seasonal diagram made by male farmers in Wojnie shows that the main religious events are also associated with major agricultural activities (Figure 4.8). Especially September, the month of the New Year celebrations, has a large range of activities in agriculture. Kusqam (the annual celebration for the saint of the local church), Gänna (Christmas) and Timkat (the annual celebration of the Holy Arc or *tabot*) are the times for harvesting. Between Timkat and Fasika (Easter) the farmers are ploughing their land.

September	October	November	December	January	February	March	April	May	June	July	August	Poagme
	Plowing			**Plowing**	**Plowing**	**Plowing**	**Plowing**				**Plowing** Fallow & chickpea	
Planting Tomato Potato Garlic Onion Cabbage Chickpea					**Planting** Onion Garlic Potato (irrigation			**Planting** Fingermillet Sorghum Bean Maize Potato	Barley Wheat Pea	Teff		**Planting &Sowing** Barley (2nd time) Chickpea
Harvesting Barley Maize	Duranje Bean Pea Wheat Hay	Teff Hay	Sorghum Fodder stalks	Chickpea					**Weeding** maize fingermillet	**Weeding** other crops	**Weeding** 2nd time other crops Teff	
		Threshing Bean Pea	Teff	Teff Sorghum								**Harvesting** Barley Hay
Compost Preparation					Soil mgt						Compost Preparation	
Queen Hive											Hive construction	
						Cutting of		**Planting** Shiwaha Kundshat Kulqual				
									Gesho Eucalyptus Peach T'ena Adam			
New Year		**Kusquam**	**Gänna**	**Timkat**			**Fasika**					
				Social		**House construction**			**Preparation of seedlings:** Gesho Eucalyptus			

Figure 4.8: Seasonal diagram made by the male farmers in Wojnie, Ambober.

A connection of social life, spirituality and trees/forests existed among the Falasha and the Qemant (3.3.1) who were originally following ancient Hebrew beliefs. Nowadays in Ambober the farmers are devout followers of the Ethiopian Orthodox Church. The connection between social life, spirituality and trees/forests still exists to some extent: also the churches of the

Orthodox Church are surrounded by trees (Figure 4.7). These trees are important because they give shade and grace for the church and the ancestors buried there, and they provide a good meeting place. The trees around the church in Wojnie are also ancient indigenous trees that have become rare in the area. And it is forbidden to cut trees around the churches. In Woglo the church has been built recently. The church forest also looks different from the more typical church forest in Wojnie: the trees are more scattered, and there are no ancient trees of rare species like juniper, as I have seen around other churches in the area. The priest in Woglo told me the history of his church. The church was first established hundreds of years ago, and then burned by Mohammed Gragn. After long time the church was rebuild, but then again burned by the Sudanese. After that there was again no church for some time:

> Priest: […] In 1956 the land lord received this area and the other people they believed that is better to have a church because they want to have a place to prepare it when they will die, then they are asking to have a church and they re-establish that.
>
> Birgit: And do you know that forest, those trees, where they there at the time when the church was built? Or did they grow after the church was built?
>
> Priest: The trees are there before the church was built but after the reestablishment of the church since we are protecting the area from the people not to cut trees and the other trees which we planted now in the surrounding of the church.
>
> Birgit: Which seedlings did you plant, and where did you get them from?
>
> Priest: There is *worka*, *gundo berbere* and *arze libanos* found around the river Wuzaba. We also plant the cuttings of *shiwaha* in the surrounding area of the forest as a fence.
>
> Birgit: Where do you get *shiwaha* from?
>
> Priest: From the trees of the people living in the village. And we planted *kinchib*, as a fence in the church in addition to *shiwaha*.
>
> Birgit: So when that land was previously not a church, what was the land used for?
>
> Priest: It was a grazing land.
>
> (Priest, 67 years, Woglo, interview 9.6.2010)

In this case the church forest was planted by the priest and the farmers. They brought the seeds from the area of the river Wuzaba, and from the farmers in the surrounding areas. His account showed that this area had been settled for long time, and it was probably de-settled and re-settled again after the different wars that also destroyed the church. The hill where the church is located was used as grazing land. If there was a pre-Christian meaning to the site at all, it had been forgotten. Nowadays it is the church that adds spiritual meaning to the place. When there was no church the land was used for grazing, and the forest was not maintained as

it had been around Wojnie church. The time when the church was finally rebuilt was also a time of resettlement. According to the farmers I interviewed, most people started settling in Woglo in the 1950s/1960s. This was also confirmed by the priest himself who told me that his family had been landlords in the area. According to him there were only five houses here, also in Wojnie. But as the priest said above, it was important for the people living here to have a burial place. Nowadays the church is also the place for meetings for social institutions like *maheber* and *senbaté*. One farmer during a FGD in Woglo explained a personal affiliation with trees:

> The thing behind in the church forest is that it has belongingness to the guy who planted the tree. There are trees which we call "Mister" or "Priest (name)'s tree". That creates an interest to other people to be called by the people and it is also a means of remembrance to the people if they died. There is a big tree in Woglo church which we call "Aba Ayal Warka" and no one will cut this tree and it is also something which makes his relatives and children happy to remember him. People who would like to have such a name will participate in planting and cultivating trees in the church area. The other thing is if someone tries to cut a tree from the church forest, he will be blamed by the society and will be separated from the church group and will live without religion. No one wants this life and will never try to cut a tree from the forest land. (Focus Group Discussion, Woglo, December 2011)

This personification and remembrance through trees provides an additional incentive for people to plant and maintain trees. Through the existence of the tree the memory of the deceased continues to live. The other aspect he mentioned was the severity of punishment if someone cut a tree from the forest. This punishment was expressed in different ways by different people during the interviews.

I was wondering if the priest as the guardian of the church forest, and also owner of a fenced orchard of olive and *gesho* trees, would not be more interested in trees than other farmers:

> Priest: I don't want to cut trees and even the government tells us to protect trees in our land and in public land but there are people who are not grow trees on their land and again they are trying to cut our trees.
>
> Birgit: What is important about trees, why is it important to have trees?
>
> Priest: Trees are very important for the construction of houses, and for the ploughing materials like *Kember*, *Diger*, *Mofer*. And it is important and useful for our everyday life.
>
> (Priest, 67 years, Woglo, interview 9.6.2010)

The orchard he was maintaining was unique in the area of Woglo, and there were beautiful olive trees (*weira*) growing there. He was not only protecting the land of the church, he was

also protecting trees as a farmer. He saw trees as an important component of their life. However, my translator and I tried to probe him further, but we could not get much information from him, and his son, who was present at the interview:

> My translator and I were both wondering why the priests do not know more about the relation between the church and the trees; they did not give us much information about this. I think that they were simply not talking to us about it, and thus did not share this knowledge with us. I had the impression that the old priest was quite guarded, also he did not want to spend too much time with us and wanted to leave soon. (Observation notes, interview with the priests of Woglo, father and son, 9.6.2010)

Another issue I was wondering about was the lack of church images inside of the churches. None of the churches I had visited in Ethiopia showed any paintings that featured trees while there were many trees surrounding the churches.

> Birgit: Why does the church have a forest in the surrounding?
>
> Priest: In the past time our fathers wanted to protect the surroundings from externals, so they plant trees, and to protect from wind. […] In the surrounding of the church, only some types of tree are planted like juniper, *worka*, *weira* because of their long duration. Beyond this they serve as wind break.
>
> Translator: When pictures of different holy things are painted in walls and other materials inside the church why we do not find pictures of trees. Is there a reason behind?
>
> Priest: Hummm.
>
> Translator: What kind of belief does the church have about the importance of tree or is there any written document inside holy books of the church about the importance of tree?
>
> Priest: The priests of the church preach us to plant trees around the church.
>
> (Priest, 67 years, Woglo, interview 9.6.2010)

In this way I could not find out much about the relation of the church to the trees. The main role he pointed out was the use as a burial place, and as protection from wind. However, the priest himself expressed interest in trees, and as long as we did not ask him in relation to the church he was willing to talk about his knowledge about trees. I also asked the priest in Wojnie why there were so many trees around his church:

> It is because they are protected with generations. Since the church will have a graveyard in the around site, and some people will plant trees to be a shade of the grave. No one is able to cut a tree from the church area, because they respect the church, and they are afraid of the Holy Arc, the *tabot*. There may be a problem if they cut a tree from the church area. So that is totally protected and respected by the society. And even the church may have no guards, but whether there is a guard or not, no one will cut the trees from that area, so that it will have much forest cover. (Priest, 30 years, Wojnie, interview 9.3.2010)

He associated planting of trees with a graveyard. The ancestors buried there protect the trees according to him. But the real protection comes from the *tabot*. The *tabot* plays a very important role in the Ethiopian Orthodox Church, and strong supernatural powers are ascribed to it (compare also Hancock 1992). The fear of the *tabot* is very strong. The *tabot* symbolises the Holy Arc. The original Holy Arc was brought to Ethiopia by King Menelik I, son of Queen Makeda and King Solomon. Every church of the Ethiopian Orthodox Church keeps a replica of the *tabot* in a hidden place that can only be entered by the priest.

> Birgit: What does he think why in the churches when there are paintings you never see any trees on the paintings, how does he explain that?
>
> Priest: A forest is the area in which many of the holy fathers are resigning themselves from the evils and sins of the world and it is preferred for its silence.
>
> Translator: But, when we see most of the paintings in the church, it is difficult to find trees with them and would you say something up on that?
>
> Priest: May be some senior people in the church and old priests may know that and I don`t have that much knowledge in it.
>
> (Priest, 30 years, Wojnie, interview 9.3.2010)

He explained that a forest was an area of peace and silence, but he did not want to or could not answer my question about the paintings. However, my translator made an interesting remark on this topic:

> Translator: Actually he has no explanation about this. But even I am recognizing that when you are asking the question. And in some scripts the forest is seen as the evil spirit area. So the one living in the forest may be recognized as an evil spirit. But there are even monks living in forest areas, but still no painting has been seen with the forest.

I followed this explanation up in a conversation with an Ethiopian colleague of mine who did not want to be quoted personally on this issue. He explained to me that it was normal that no one wanted to tell me the truth about this, because it was kept as a secret. What he told me was this:

> When there was a fight between the angels, and Satnael ruled on Earth, there was a group of angels siding with him, and another group siding with God. And there was a group in the middle, neither good nor bad, or perhaps both of it. They are called *qole*. And these *qole* select big trees for their residence. So the priests are telling the people if they are disturbing the peace of the *qole*, then they will be angry and bad things will happen, for example this person may break his leg or worse than that. There are also certain times of day where it is not advisable to walk through a forest. One should be very silent, in order to avoid disturbing the *qole*. (anonymous informant, pers.comm. 20.5.2012)

I already mentioned the *qole* in 3.3.1, where I am following the explanations by Hancock (1992) and Levine (1974). There the *qole* are called spirits, either good or bad, inhabiting trees. The Qemant also know the *qole*:

> Sites where major spirits, genii loci called *qole*, are worshipped are second in importance as places of worship. The *qole* site is smaller than the sacred grove, and is used for venerating a local spirit who can be reached only at his particular abode. Sites of *qole* worship are in high places, almost always on hilltops or on the edge of an escarpment. They are usually marked by single tall tree or a prominent rock or pinnacle. (Gamst 1969:28)

In contrast to this intimidating story, the priest of Wojnie told another story about forests and the church:

> Priest: Even though there is no scripture about the recent Ethiopian saints, but there are forest areas where monks are living. Once someone wants to be a monk or nun, he or she prefers to live in forest areas which are far away from human connection. In most cases these places are difficult to access. Like Mahberesilassie, Gond Teklehaimanot and Waldba, these are monasteries in remote and forest covered areas where people going there will not come out from the area. They are restricting themselves from being involved in the sins and evil practices of urban areas. They don't want to see these urban areas. They will sustain there until they will die.
>
> Birgit: Why do these people live in the forest?
>
> Priest: Because they hate this evil World, by preferring to live with God, without any disturbance they will pray the whole day, it will be a fasting for the whole day, without any disturbance from the World. In addition, the products of the forest can be their food (like fruits) and they are using the forest like their home.
>
> (Priest, 30 years, Wojnie, interview 9.3.2010)

These monks and nuns were thus using the forest like a refuge, a place free of sin, temptations and disturbance. They probably had substantial knowledge about the forests, as they were using the forest for subsistence to sustain themselves. In this account the forest had a positive meaning, a place of peace and harmony, in contrast to the intimidating story about the *qole*.

These two conflicting images reflect the ambiguous relationship between the people in Ambober and their God: it is characterised by veneration and fear. Fear of retributions if one is acting against the will of God, in destroying trees around sacred sites for example. Veneration in the knowledge that God knows everything - and the knowledge given by God must not be questioned. Invoking this fear gives the priests power, as the example of the *qole* shows. Farmers in Ambober felt that their whole life was connected to God, and so many explanations were given in relation to God's role in their lives. For example, when I asked a farmer in Wojnie why some farms have more rocks, while others are free of rocks and stones, he simply

answered, ‘It is just natural. It is done by the creator’ (Farmer, 60 years, Wojnie, village walk, 24.3.2010).

Like a scientist I was seeking a logical explanation, but for the farmer in his spiritual ways of knowing this was God-given. I received a similar answer when trying to find out more about a geological divide going right through the Woglo Plain. The farmer I was talking to was of course aware of it, because this divide was very visible. According to him it differentiated different soil and land use types:

> Farmer: This rock it can cross even beyond that area. [the geological divide that goes right through the valley] […] I never saw it and even elders didn't say anything when did it happened. However, the stone bed exactly crosses the village in two. There you see in the middle of the two hills is the main agricultural land of the village people.
>
> Birgit: Is there any difference between this area and this area?
>
> Farmer: The difference between the two sides is the type of crops grown. The crops grown in the left side of the stone bed are different from those growing in the right side. […] In the left, we can grow pea, beans, sorghum and in the right side, we grow teff and chick pea. It is because the soil in the two sides is different. The land on this area is red soil and in the other side, it is black soil.
>
> Birgit: Why is it different in these two areas?
>
> Farmer: We do not know, it is the will of God.
>
> (Farmer, 45 years, Woglo, Village walk, 30.3.2010)

Like me, the farmer perceived the natural phenomenon in his environment. And he understood the consequence of it. But he was not seeking an explanation for it, as to him it was clear that this landscape was given by God as it was, and if there was something like this in the landscape, then it was there, because God wanted it to be there. As a human being the knowledge how to handle this with technologies was enough, but trying to understand why this phenomenon was there did not seem important to this farmer. This clear understanding about what is to be known by human beings, and what is in the hands of God was also expressed by another farmer in Woglo:

> We grow our crops in these areas giving the whole thing for God. (Female farmer, 60 years, Woglo, interview, 11.3.2010)

She emphasised that the farmers could grow the crops, but if the harvest would be good or not, or what kinds of natural disasters might impact on their lives, all of this was in the hands of God. This understanding of life supports intuitive thinking, and intuitive ways of knowing.

The farmers accept the plan God has made for them, and they work within the boundary this plan is presenting to them. Understanding this, and acting accordingly, does not work if one tries to apply logic and reason. This would lead to questioning God, and that is not possible in the Amhara and Qemant world views.

4.2.2.2 Emotions and Memories

Emotions and memories and their role in ways of knowing are subject to wider debates in literature (compare Taylor 2001). Dirkx (2008) explains that there are time-limited and focused emotions occurring in a specific context. As examples he mentions 'an angry reaction to being cut off in traffic or feeling insulted by what someone says in a group discussion' (Dirkx 2008:10). Other emotions are more independent of particular contexts: for example feeling blue or excited about something without really knowing why (Dirkx 2008). This can be called 'mood'. These emotions can be influenced by memories. I am focussing on long-term memory that involves different kinds of memory systems that are important in defining who we are (Squire et al. 1993 in Taylor 2001):

> One part of the long-term memory system is explicit (declarative) and conscious, indicative of two types of memory, episodic (autobiographical) and semantic (general knowledge about the world). In declarative memory individuals are consciously aware of the storage and retrieval of information. […] A second system […] is implicit (nondeclarative) memory, which involves the nonconscious development of thoughts and actions. […] From implicit memory emerge habits, attitudes, emotions and preferences inaccessible to conscious recollection but they are nonetheless shaped by former events, influence our present behaviours, and are an essential part of who we are (Roediger 1990, Schacter 1996). (Taylor 2001:226)

These implicit memories influence emotions, attitudes and preferences, and they are crucial for ways of knowing, as they influence what we are interested in, what we want to know and what we feel (and think) about certain types of knowledges. The unconscious development of knowledge is a critical issue for alternative ways of knowing, but it is hard to grasp.

Emotions and memories contribute to the development of knowledge, but little research has been done on this issue until recently. As pointed out in 2.1.2 some authors are suggesting that reason is connected to emotions or feelings (Damasio 1994). Taylor (2001:219) discusses this in more detail in the context of transformative learning: 'In particular, three areas of research that have received much attention from the field of neuroscience are the study of emotion and memory and their relationship to the cognitive processes of the human brain.' He points out that, 'All things considered, the emphasis on rationality, particularly critical

reflection, is imbalanced and much more attention needs to be given to both the roles of emotions and implicit memory in the transformative process. Despite the significant insight that the previously mentioned studies reveal about the role of emotions and the nonconscious play in transformative learning, they are limited in describing their intricate relationship with rationality.' (Taylor 2001:221). He furthermore ascertains that people have difficulties identifying emotions and reasoning processes and seeing how they are linked to each other; but research in neurobiology and psychology has nevertheless shown evidence for 'the interdependent relationship that exists between reason and emotions and how decision making can occur outside one's conscious awareness.' (Taylor 2001:221). Taylor (2001) also points out that our wealth of knowledge forces us to make choices between knowledge that is relevant for us, and knowledge that is irrelevant. He claims that emotions are decisive in making such decisions based on salience:

> Emotions establish the agenda for desires and beliefs. They are metaphorically the equivalent of judgements, determining the criteria of how we view the world. […] Without emotion, individuals are unable to co-ordinate their behaviour, respond to emergencies, prioritize goals, prepare for proper action and make progress towards goals—incapable of filling the gaps often found in the slow and error-prone process of objective rationality (Johnson-Laird and Oatley 1992). (Taylor 2001:223).

For my research these debates are useful in understanding people's ways of knowing and the choices they are making. This is particularly interesting to illuminate when their actions contradict what the farmers actually know. Several times farmers would say during an interview that he or she thought that trees were important and that deforestation was not good, but at the same time this farmer did not report doing anything contrary to deforestation. Some even admitted contributing to it:

> Farmer: When I came here in 1960 it was covered by forest, gradually it has started to become bare and we are responsible for it. Even I settled here by cutting the forest. […] People go there every day for cutting it [the forest].
>
> Birgit: Why did they cut it?
>
> Farmer: You look for wood to make fire, sell for everything that it can be used for.
>
> Birgit: Why are the people not replanting the forest?
>
> Farmer: No one is interested to plant new trees. Even there is difficulty in keeping what we have.
>
> Translator: Why?
>
> Farmer: No one knows the real use. The existing one is enough if everyone acts like a guard.

Birgit: What is so important about forest? Why do you need forest?

Farmer: I have heard it is the cause of rainfall.

Translator: Who says this?

Farmer: People talk this.

(Farmer, 74 years, Woglo, interview, 11.3.2010)

The example of this farmer questions the narrative that people contribute to deforestation because of a lack of awareness and a lack of knowledge about the importance of trees. There are many factors contributing to deforestation and how it is framed as already discussed in 1.4.3.2. This particular farmer - like the people he was referring to - was aware that there was a connection between forest cover and local rainfall events which is a very important function for a farmer. He was an elderly farmer and he was a member of the Derg with public roles in the community at that time. While he could attend trainings at that time, afterwards he no longer had access to training. During the interview he told me that his knowledge about tree and soil management was also influenced by his parents, and his sons. One of his sons was a farmer in Woglo and growing a large variety of trees and propagating trees himself. Another son was working for the government in agricultural extension. He himself was growing a large variety of indigenous, exotic and fruit trees in his homestead area and adjacent fields. This suggests that his knowledge about trees and their importance is more as he admitted during the interview. What the farmers in Ambober say, what they seem to know, and what they do does not always make sense to an outsider. This is partly the case because the farmers both in Galessa and Ambober do not trust outsiders – given the historical experiences and the tight monitoring system of the present regime this is not surprising (International Crisis Group 2009). But in other ways it is also connected to how they acquire knowledge and which ways of knowing influence their decisions. I argue that emotions and memories play a very important role in this: the decisions how the farmers are using trees, and soils, are influenced by more than just reason and logic. In fact many of their decisions seem illogical – the farmers know that higher tree cover will increase rainfall that is very important for their farming practices, but still they show little interest in increasing tree cover. I am aware that to some extent these decisions are influenced by for example economic motivations, lack of land, and lack of labour (see also 4.2.1). But there are some important issues related to their ways of knowing that influence the choices they are making, and these are often overlooked. These issues relate to the individual, personal situation of each farmer in Ambober and Galessa, and the decisions they are making based on their emotional experiences and implicit memories.

And these influence the choices different people are making for example regarding tree management in different ownership settings, as was explained by this farmer during a Focus Group Discussion (FGD) in Woglo:

> There are people who want to use the government forest for today and they are not worried for the day after tomorrow. There are also people who think about even or the future generation and want to see areas covered with forest and try to protect the area from being destroyed by those people who don't think about the future. But it is difficult for someone to quarrel with the other people whether he might see them cutting trees. It is totally different for the private and for the government types of forest in terms of cultivation and protection. If it is the government forest, as my friends already said, it depends on the strength of the guard. If you look at that forest area, it is protected by the government and the guard delegated by the government, there are different types of trees which people would like to see, there are different wild animals and birds. Even though there are people who have good understanding upon the forest area, there are many who are always cutting trees. (FGD, Woglo, December 2011)

Government protection of forest was not new to the farmers in Ambober. As I mentioned in 1.4.3.4, the memory of the Derg regarding management of trees and soil is a memory of coercion for many farmers in the Ethiopian Highlands. This was also expressed by farmers in Galessa and Ambober. For example at both sites farmers explained that deforestation was severe after the fall of the Derg, but also during the transition from the Imperial Regime to the Derg. Many people were taking advantage when the tight control on resources by the leaders eroded. They used the resources that were forbidden for them in the preceding regime. This had a particularly negative impact on forest and tree cover in Galessa.

> […] During the Derg soil bunds were constructed on farmlands and there trees were planted. But the people destroyed those soil bunds and the trees were cut. (Female farmer, 35 years, Ameja, key informant interview, 9.12.2009)

> During Derg Regime there was a forest cover around this village. But Derg were so serious and were not allowing the farmers to let their cattle enter into the forest, so we were forced to use that communal grazing land at that time [which was very far away]. (Sombo, Village Walk, 30.3.2010)

> In 1983 (Eth Cal) during the transition period when the Derg fell the trees disappeared. During the Derg regime they did not allow for cutting trees, so when they fell the people cut the trees. (Farmer, 30 years, Tiru, interview 8.12.2009)

Several farmers in Galessa mentioned during the interviews that soil bunds, terraces and trees were destroyed after the fall of the Derg regime. Some farmers mentioned that ‘the people’ regretted this later on. But the fact that the farmers experienced exclusion from forest resources during both the Imperial and the Derg regime had manifested their perception that ‘forests do not belong to the people’. In fact participatory and communal forest management

is still a recent phenomenon in Ethiopia (1.4.4.2). This impression was also supported by the accounts of farmers in Ambober:

> Yisha forest was a farmland before the Derg regime was coming. And in the Derg regime since it is a mountainous area it is decided to be a forest land, where the livestock can graze. So it is protected in that regime. (Village walk, Woglo, 30.3.2010)

Yisha forest is an example of farmland turned into forest land during the Derg in Ambober - similar to the Workamba forest that resulted from the Joint American Fuelwood project (3.3.1). In contrast to other forests it could be used for grazing. This shows that during the Derg there were some forest plantations in Ambober. But on the other hand, several farmers mentioned that a lot if not most trees were logged during the Derg Regime. An elderly female farmer living in lower Woglo confirmed this:

> It was during Derg regime but in Haileselassie regime the forest was good and there was no one that cut trees. During Derg regime, much of the destruction was occurred. People were destroying by cutting and taking the tree to the market and some of them was preparing charcoal. When EPRDF came to power, they said stop cutting the trees because the land has become bare and crop production become reduced. Instead, you have to re-plant the trees and conserve soil and water through building terraces and bunds. So, it is during EPRDF that the forest was rehabilitated. […] The forest gets privilege and well protected during EPRDF. Even though, the forest was protected, planted and had a guard during Derg regime, the people took the trees at night. But these days it is well protected. (Female farmer, 73 years, Woglo, interview 14.1.2011)

She explained that much destruction of forest had occurred during the Derg regime, but after the EPRDF took over forest cover improved. If the people were not in support of the protection, even a guard was of no use, she explained. Nowadays forest protection has improved according to her. However, other farmers frequently raised concerns and fears regarding possible land redistributions or villagisation (resettlement of farmers into villages) – and these fears also influenced how they managed their land. These concerns and fears were more prominent among people in less powerful positions in the communities. The more powerful farmers interviewed were model farmers and/or held official positions in the community such as village chairman or head of different social institutions.

In Woglo I met one female farmer repeatedly who was known to be very experienced in tree and soil management. She was observing her land very well, as I learned during a visit to her house and some of her land. She was a widow, but her children were still living with her.

> We heard about this lady because she is protecting trees on her farmland, to become a forest, and that she will not allow anyone to cut from there. […] She has a tree right in front of her doorstep and the area around her house is full of trees. […] She knows many, many

> trees, and she also has many trees on her farm. Some areas that belong to her farm are grazing land, where she keeps and protects trees. She will not allow people to cut them, but she is afraid that they will try it. When she sees people cutting olive trees she shouts at them, and even throws stones. […] She gave us a lot of information, also about soil. She has been involved in farming all her life, because she was still young when her husband died, so she knows a lot. The other people keep telling her she should cut the trees on her grazing land and start growing finger millet there, but she does not want to. (Field notes, 11.3.2010)

She made decisions on land management based on her knowledge. She partly inherited this knowledge from her father, and partly developed it herself. The decisions she made regarding the management of trees on her land did not seem rational to other people – it did not make sense to them. In both Woglo and Wojnie the young people were complaining about land shortage, but she did not manage her land as if there was a shortage of land, she gave space for nature to spread and thrive on her land. During the interview she expressed disappointment and anger about the other villagers, because they did not maintain the forest and many did not plant trees. The most important influence for her was her father, who from her childhood told her about the importance of trees and soils. He was a famous landlord and known to protect the trees, and she continued his legacy in spite of strong resistance from parts of the community. At the time when they moved there from a neighbouring village, the area was covered by forest. As a child she was collecting fruits from the wild and in this ways got to know many different trees.

> The forest cover in this area was so nice. We are going inside the forest area, it was a shade and we even did not see the sun. We were going in the forest to fetch the fuelwood and water. At that time we had a lot of fruits in the forest, and no one of the kids is having his lunch at home. We are having *wanza*, *agam*, *kaga* and *enkoi* which are fruits. Nowadays it is totally destroyed. […] My father was a very good farmer. He was trying to have much forest. I love forests. If some seedling is coming from the soil, I will protect it from animals and human. I don't want to see any seedling dried in my farmland either it is *bisana*, *shiwaha* or any other tree. I know this from my father. That is why I have a lot of trees now. (Female farmer, 60 years, Woglo, interview, 11.3.2010)

During the interview she expressed her feelings about the forest, she loves forests. While talking to us she revived the memories of eating in the forest, fruits that according to her were lost nowadays. The emotional experiences as a child for her were deeply connected to her loving memories of her father. She emphasised that her father had been interested in keeping forests, and that she would protect tree seedlings from animals and humans. It was quite a strong statement of her to say that she would throw stones at people trying to cut trees, as she said above. She tried to explain to me what she felt about the forest, and I could clearly

see in her facial expression how deeply and emotionally she felt about it, but it was difficult for her to put it into words:

> Forest is life. […] I prefer to sit outside in the shade of the tree, rather than sitting in my home, I feel that in the hot seasons it is better to come out and sit in the shade of trees. I don't know where it comes from. Actually my father was like me. But it is my internal feeling. I feel that this is life. I feel that it will bring us rain. […] I am not interested to cut even a leaf from my homestead. When I am weeding, I feel bad if I weed trees and I left it. (Female farmer, 60 years, Woglo, interview, 11.3.2010)

She expressed many different emotions when it came to nature – she felt good sitting in the shade of trees, and preferred sitting there, even though she could not rationally explain why she felt so good about trees, and why she even felt bad when she was weeding. For her trees were life, and they were the source of rain – this was a fundamental role in a drought-prone area like Ambober. Her strong emotional connection had made her a very observant farmer, and she was trying to share this knowledge with others, but not always with success. Because of her descent from a landlord family, and the fact that she was a widow, her influence in the community was not high. In other cases where a strong farmer had learnt a lot from his forefathers, this was often publicly emphasised which gave him a stronger position in the community.

In Galessa I met another very strong female farmer, who had a very emotional way of knowing. She was a widow, and when she lost her husband a few years ago she started her own business in her home garden. Unlike the previous woman, her memories of her lost one, in this case her husband, did not seem positive; although she did not tell me directly, it was clear from how she was telling me her story. She had very strong emotions about how she started her own life as a widow, as if she had been released from a prison, and how she became successful through her own knowledge.

> I have also got a horse. But it is not only barley now that I am growing, I cultivate vegetables, different vegetables, and those I sold to the market. Even I construct one iron sheet house in Kdamei Gabbea after my husband died. I plant not only different vegetables but also onion as well as improved spice, and even Gesho and Enset. I produce different types, you can observe that around my homestead. [she is obviously very proud of her achievements and keeps interrupting the translator] Now and then after my husband died 6 years ago I am just strong enough to cope with every constraint I face. I do work as I said, and now I have well adjusted my livelihood. I am not healthy as such, but I am trying my best. (Female farmer, 60 years, Abeyi, interview, 10.5.2010)

She listed her achievements such as the vegetable and spice business in her garden, and that she could even construct a house in the near market town, which was quite a considerable

asset in this environment. As I was very impressed with all she was telling us about her farming, her knowledge of trees and soils, and how she had built up her life as a widow, I asked her where she got all her knowledge from. The answer was as clear as it was mystifying to me: 'I learned by my own, and God teaches me' (Female farmer, 60 years, Abeyi, interview, 10.5.2010).

A walk in her homestead garden showed me that she had even more knowledge and experience than she had explained to us before. She grew many different trees, shrubs, herbs and spices as well as vegetables. Every plant in her garden had a meaning or a purpose.

> This tree is *hinne*. During Meskal day we use it. We cut it and we put it in front of our house, and we pray. […] This one is used for fence and it protects our crops. This one is *t'ena Adam*. […] This is *arita*. This is used for medicine of livestock, for bloating. […] This tree is called *koshenet*. It is useful for butter, it adds taste to the butter. […] Here is *amfar*. We are using this tree as an *adbar*. (Female farmer, 60 years, Abeyi, interview, 10.5.2010)

And so she provided a long list of the plants in her homestead that she was growing for different purposes, and she obviously made a good income from it, as her house was in a very good condition. In her case the loss of her husband seemed to have given her the freedom and also the drive to prove that she could become rich with her knowledge. This had driven her in a very emotional way to acquire new knowledge and to improve her life.

4.2.3 LANGUAGE

Language is never neutral. Certain terminologies and symbols applied are understood by some but not by others. Language used by individuals or groups influences ways of knowing; this language may be accessible to some, but not to all. Language is influenced by individual backgrounds, beliefs, ideologies and authorities, and it is associated with power. Written language establishes facts over oral language that may be more embedded in tradition but can be lost easily. Certain expressions, body language, words not spoken, silences and changes in tone change how knowledge can be understood and valued by the listener and observer. In such ways the information given can be valued before it reaches the listener. In addition, who is speaking, and in which role and authority, influences how knowledge will be perceived by the listener, especially if the listener is already biased for or against this authority.

Language is also different in 'quality' – it matters if the languages of communication are first or native languages or languages acquired later. Certain nuances in communication get lost, and

both the person who is using a non-native language and the person who is listening may miss salient pieces of knowledge.

Figure 4.9: Farmer in Galessa explaining his homestead garden to scientists.

Figure 4.10: Conference hall during workshop in Addis Ababa. Farmers are sitting in the left corner wearing hats.

An example where language played an important role in ways of knowing was a field day in Galessa (see 5.4.2). During this day it became clear that not only did most farmers and scientists speak different languages (Amharic, English, Oromiffa), but also the ways they were using the languages to communicate were very different. We started the field day with a walk across the fields and then visited some farms where farmers held long speeches in Oromiffa.

> After this we continue to visit a homestead with vegetable farming and *enset*. […] Most of the time the foreign scientists do not get a translation of what is going on, and they seem to accept it […] In the background, at the homestead, some women are working, but they do not join us and disappear from sight quickly. […] The farmer is standing in the middle of his garden, the scientists are cornered outside of his plot. He seems quite confident, even though sometimes the audience is laughing about him – I ask why, and NN explains to me that he said that when there is a church holiday and they work, then the crops will fail. I asked if he was serious, and NN says yes he was, but still they were laughing about him as if he was joking. (Field notes, 20.10.2009)

There are three important messages in these notes: Firstly, accepting the inaccessibility of the farmer's language as a given fact tells a silent but powerful message: the foreign scientists were not actually interested in what the farmers had to say. Secondly, the fact that those scientists who understood the farmer were laughing when he made that statement about the crop failure (as an alleged punishment for working on a church holiday) shows disrespect for the spiritual beliefs and ways of knowing of farmers, expressed through their reaction. Thirdly, the fact that women were silenced and excluded from this event also remained unobjected. Thus the visiting scientists showed little regard for issues of power and exclusion during this field day.

Among the scientists, women were also a minority. Women during this field visit were not given a voice, neither by the male farmers nor by the scientists – this was surprising to me as the GWP took care to include women in their activities, such as the nursery group and trainings. However, in the main GWP publication, female farmers were usually addressed as 'female-headed households'. Other female farmers were rarely considered as separate actors. This presumes that only in households that have no male household head, the women have a voice representing a different viewpoint. Female farmers in male-headed households are not considered separately in the main GWP publication. This hierarchy is also reflected in the fact that they were not the ones selected (by the community) to hold speeches in front of the scientists. During the seasonal diagram discussions, the farmers in Sombo expressed that in October the most labour-intensive season for women was starting. In Tiru and Abeyi, this was dated to November/December, however it was already late October. Therefore this was probably one of the reasons why women did not participate more actively. If the workshop organisers had planned to give adequate weight to male and female voices in the field day, they should have considered this fact.

I noticed that farmers giving presentations to the scientists did not use any notes. They positioned themselves in the middle of their crops or next to their livestock and talked for a long time, sometimes pointing to the crops, the soil or the livestock (Figure 4.9). Their surroundings became part of their language without words. This was in stark contrast to the experiences of the workshop days in Addis Ababa, that were also attended by both scientists and farmers (see 5.4.1, Figure 4.10). There the scientists were presenting in Amharic and English using PowerPoint presentations (PPP) standing in front of their audience in a big conference hall. Unfortunately, it was difficult for the farmers to critically assess this workshop during the interviews, as my translator was also working for the workshop organizer. The ones I interviewed expressed appreciation for being invited. Among the scientists some made critical remarks about the workshop experience: they complained that the language issue created a barrier, and that the organisers did not do enough to enable farmers to participate actively. The latter was also discussed during the workshop in a small group after the first day. From the discussions with the organisers and some participants, and based on my own experience as workshop and field day participant, I perceived the wish to go further and to involve the farmers on a more equal level as contributors to these events, rather than passive listeners. The presentations of the farmers on their land gave the farmers the opportunity to talk about their experiences in their own setting and their own language. But the response of the scientists was not engaging; few scientists used the opportunity to discuss with the

farmers in the field about their work. The initiative of one farmer at the end of the field day showed that the involvement of indigenous research and presentation methods could have been helpful to make the workshop and the field day more inclusive for all participants.

> After this presentation we walk back to the road, and there a big group is gathering and the final speeches are delivered. […] The scientists talk, the government people talk, and the male farmers talk. GR tries to cut the ceremony short, but many people want to add something. Then there is one farmer stepping out and he starts reading a story or rather a long poem he has written about the project activities of HARC, he reads in Amharic and then in Oromiffa. The style is a bit like the stories told in the *asmari bet*: he involves the people, like GR, and makes jokes about them. Everyone seems to like it, and one of the foreign scientists calls GR to tell him that he has to get this paper to include in the proceedings. He talks to the farmer, but he does not get or take the paper, so I am not sure how serious he is about it. (Field notes, 20.10.2009)

In Ethiopia story telling is an important part of culture, and traditions and knowledge have often been passed from one generation to another by using stories and songs. As Ethiopia has its own written tradition, many such stories have also been written down (Gerard 1968). The contribution of the farmer was an interesting moment for both farmers and scientists. He was using a traditional method in talking about how the project had changed their lives that even impressed those who did not understand a word he was saying. But I could not find the poem in the proceedings later on. Using more traditional methods like this could be helpful in bringing farmers and scientists closer together. After all, the scientists are embedded in the same culture and traditions, especially if they also grew up in rural or semi-rural areas. And for the scientists I interviewed this was the case for most of them.

As compared to the EP in the GWP finding a common language was a challenge – but it was not critically reflected, partly for political reasons. Ethnic differences are a sensitive topic in Ethiopia. Under the Amhara-dominated Derg regime Oromo people were not allowed to use their language and it was not taught in school either. Nowadays, the policies have changed, and children are only taught in their first language in primary school. In Galessa, therefore, many farmers understand Amharic but for political or personal reasons do not want to use it.

In the GWP only one of the scientists I interviewed understood or spoke Oromiffa. The two technical assistants working for the GWP were both Oromo and spoke Oromiffa fluently. Nevertheless, communicating with farmers, and particularly organising workshops and meetings was challenging in terms of language and translation (see 5.4.1). Some of the farmers in Galessa spoke Amharic, but others did not want to express themselves in broken language (or refused to do so for political reasons) and thus kept silent. The Amharic speaking farmers

benefitted from their language skills, because the scientists always preferred to approach them. I asked the scientists participating in the GWP about this, and one explained it to me as follows:

> Birgit: Do you speak Oromiffa?
>
> Scientist: Not a lot.
>
> Birgit: So how do you communicate?
>
> Scientist: You can communicate Amharic, no problem. They can speak Amharic.
>
> Birgit: Well, then this is easy for you.
>
> Scientist: Yes, and we decide to have a field facilitators, and community facilitators. This people should speak the local language, so especially this social science research documentation, they are doing that. Because sometimes you have to speak with their language, not Amharic. They can tell you everything if you use Oromiffa. So we do really have these two guys, facilitators, and field assistants, speaking the local language.
>
> (E-Scientist, interview, 29.10.2009)

At first he does not want to admit the challenge, but then he contradicts himself – communicating with farmers in Oromiffa seems to create an atmosphere of trust and reduces authority in language. Other scientists did not want to address this issue at all and felt uncomfortable talking about it, fearing to be drawn into the political context of the debate about ethnicity in Ethiopia.

Amharic, for historical reasons, has a connotation of authority in Ethiopia. It was the language of the imperial rulers, and the language of the Derg regime. The landlords under imperial rule were mostly of Amhara descent. This is also how the only Amharic native speaker came to Galessa:

> Farmer: I was born in Addis. This land was owned by Waezero Holetegeorgis. My mother was a servant of Waezero Holetegeorgis. This was the reason that we come here to live. We have been provided the land here, and we come here from Addis.
>
> Birgit: So you married someone here from this village?
>
> Farmer: I was married in Ilfetta, in Dendi Woreda. I had a brother who was working as a secretary in the military, he was the person who was controlling those lands. But he died, and when he died I took immediately over controlling the resources. [the land resource in Dendi, in Galessa and in Addis]
>
> Birgit: And why did you come here?

> Farmer: The land we had in Ilfetta did not belong to us. […] we were forced to come to Galessa in order to use our own land. We have been provided this land when the Derg regime came.
>
> Birgit: How old were you when you first came to this land?
>
> Farmer: It was during Haileselassie time.
>
> (Female farmer, more than 80 years old, Tiru, interview, 6.5.2010)

In her case her ethnicity and language works to her disadvantage. The landlords lost most of their land in the Derg regime, and so she ended up living in Galessa. She is now a very elderly widow, living outside the village area with one of her daughters, in a beautiful homestead with a high diversity of trees. But she was excluded from the project by the contact farmer, because he accused her that she did not contribute enough labour to the nursery, which was challenging for her as a female-headed household. Thus she was also excluded from benefiting from the knowledge transmitted by the project.

> It was weird that NN [the contact farmer] again tried to dissuade us from going there. He told us she was too old and would not be able to talk to us. But this time we insisted and we did not regret it. The house was surrounded by a big homestead with lots of trees. It looks a bit like in a fairy tale, it is well hidden. I was very surprised when I saw the old lady. First of all she spoke Amharic, and then was still very much awake and could tell us many things. […] In the end after we finished her daughters complained to us that they did not get any improved seeds from the project. One of her daughters, who lived in Addis and has now moved back to live with her mother, said you are talking about change – if you give us those seeds we can show you what change is. Apparently NN [the contact farmer] had accused them not to contribute their work to the group, and therefore did not give them seeds. (Field notes, 6.5.2010)

The contact farmer lied about her health condition. My translator told me that this had to do with the fact that he (the contact farmer) had excluded her from the project on terms not agreed with HARC. The reason he had given would have applied to most female-headed households, and also many others. If this would have been a general rule, then it would have excluded most of the poorer farmers from the GWP. This was not the case. And she had a very beautiful and resourceful homestead garden that could have served as a demonstration site for the GWP. My translator who had been working for the GWP for several years had never met her before, nor had he seen her garden. By her language and ethnicity she was an outsider in Galessa, she was the only Amhara. Besides she was an old lady with no man speaking on behalf of her – but this was not the decisive factor, because in contrast to her other women in a similar situation could participate in the activities of the GWP. Her communication with other farmers in Galessa was limited. She did not have networks of family relations with the other people in Tiru, the village where she lived. Most people in Tiru were related with the contact

farmer of the project. Even the location of her house emphasised her isolation: the house was hidden behind a small hill and many trees and bushes. Yet, she had a lot to share, as I could see in her home garden. She had already planted *gesho* and eucalyptus during the time of Haileselassie, and bamboo during the Derg regime. And she had a variety of other indigenous trees in her garden. But her ways of knowing and knowledges did not find an entry into the project, because the local contact farmer had excluded her. The scientists had trusted him and assumed he was a trustworthy spokesperson for the *entire* community. This was a comfortable arrangement for the scientists, who would have had difficulties themselves to engage with the community as such – because of time and resource constraints, but also because of the language barrier.

4.2.4 AUTHORITY AND EXCLUSION

In this subsection I will discuss which authorities and institutions of power were used to exclude people from gaining access to the use of technologies, gaining access to knowledge, or contributing their own knowledge. Such institutions enabled some actors to play powerful roles and serve the interests of certain groups or the state behind, while others were silenced. Exclusion is driven by unequal power relations and interacts at different levels from individual to global level; it leads to 'unequal access to resources, capabilities and rights' (Rispel, L., Popay, J., S. Escorel, M. Hernández and J. Mathieson 2008:2). Exclusion 'captures the experience of the certain groups and categories in a society of being somehow 'set apart' from others, of being 'locked-out' or 'left behind'' (Kabeer 2004 :2). In this case the resource I am referring to is knowledge.

Ambober has social institutions such as *senbaté* and *debo*. Members of *senbaté* meet after church on specific Sundays or holidays. Membership of *senbaté* requires some contribution from the members. They have to contribute money, and they have to contribute food to the meetings. But several landless and poor farmers complained during the interviews that they could afford neither.

> There are strong farmers and weak farmers. Some have great knowledge about agriculture and some others have not that much. Some people will grow types of crops which will not grow in the area, and the others are good farmers. So we will exchange ideas. They will learn from each other from what somebody is getting. The other will have knowledge about what the other is knowing. If there are disagreements between people, we try to settle them in these meetings [of social institutions]. They will help us to have something in agreement and sometimes we used them to exchange messages from the government. (Farmer, 53 years, Wojnie, interview, 29.3.2010)

This farmer from Wojnie, who was one of the people called 'knowledgeable' by others, explained that the main meeting types where information was exchanged were *senbaté* and *maheber*. These types of meetings also provide space for ways of knowing. He explained that there were differences in knowledge between different people, but he also mentioned that they would exchange ideas amongst each other. The meetings of social institutions were (amongst others) used to settle disagreements, but also to pass on what he called 'messages from the government'. He then explained further:

> In *senbaté and maheber* we are raising these issues and if somebody has some information from the government official, he will tell the people about that and what he is experiencing, especially any new idea. (Farmer, 53 years, Wojnie, interview, 29.3.2010)

If the government wants a message to be passed on to the villagers, it will happen through a chain of people who are handing down the information to the 'lowest' level of the hierarchy. The meetings mentioned above are used to disseminate government information to the farmers in the villages. This information can be political, but it can also be information about new seed varieties, fertilisers or new farming technologies. At the time of my study in Ambober the main topic was first the introduction of the Broad Bed Maker (BBM) for wheat production; then the elections (May 2010); and later on the main topic was the implementation of the Growth and Transformation Plan (GTP). Some farmers also get the opportunity to see other areas – either because they are visiting relatives, or they are participating in experience sharing visits to other areas organised by projects or the government. In that case this farmer would also report about his experiences at such kind of meeting.

One time a farmer whom I had already met repeatedly invited me to attend a *senbaté* meeting in Woglo. The meetings of *senbaté* take place at fixed intervals after the church service on Sunday. They have an agenda, and there is a chair who guides through the meeting. During my attendance of this *senbaté* in Woglo I started wondering because the dominant actors were almost identical with those named to us as 'knowledgeable' during village mapping. The seating arrangements also reflect the authority of the participants:

> Among the men there were three main groups: the elder, they were sitting in one corner, observing everything, but making their comments frequently, especially when decisions had to be made. The priest, though much younger, was sitting with them. Then there was a group of middle-aged men. They were the ones in charge and chairing the meeting […] The last group was the group of young men. […] The debate itself was not very strictly organised, people were sometimes interrupting each other, and very often not listening to

> each other. But the speakers really tried to make sure that everyone was listening while they were speaking, though not always successfully. (Field notes, 14.3.2010)

The elders (*shimagelle*) were respected men involved in community councils, and also in local court cases as well as conflict resolution. The middle-aged men in the meeting were partly counted as *shimagelle* as well – most of them had functions such as village chairman, *kebelle* court member of political functions, thus they were linked to the political establishment in the *kebelle*. These meetings and the time after church on Sundays and other holidays are used to 'inform' the farmers: outsiders like extension agents and scientists coming to Ambober like to use this time frame. This is when most local meetings of social institutions take place. They assumed that everyone is going to church, which is probably the case in Ambober where the role of the church is dominant. But the representation of the community during these meetings is often one-sided, and there are many community members who cannot participate. For example women must go home immediately after church to prepare breakfast for their husbands (it is not allowed to eat before church). But in holding the meetings at this time and place, the outsiders are choosing a point in time where they can still expect to meet a relatively large proportion of the community. And in fact many farmers told me that they learned about new technologies and other information from the government when the development agents came to meet them after church. However, the church has its own rules and authority, and making use of this authority for meetings with farmers that are partly political, partly informative, has its own implications.

When I attended the *senbaté* meeting in Woglo, I was wondering where the women of Woglo were. Finally I saw that they were sitting in a separate circle, away from the men. The circle of the women was separated from the men's by a row of bushes. When I asked the farmer, who had invited us to the meeting, what the role of the women was in this meeting, he told me that they were allowed to participate, but they would sit separately and would not contribute actively to the meeting. As I found out later during interviews with farmers who were landless and poor, they were excluded from these meetings for economic reasons. This included also their mothers and wives. The women of wealthier households on the other hand can access new information in the meetings, but their own ways of knowing and knowledges remain tacit, unless they are explicitly asked to contribute.

> There were two big groups – the men and the women. The women were sitting in a separate place (both places were surrounded by wooden, live fences), but within hearing range. And they were definitely listening, but they did not say anything themselves, nor were they ever consulted about anything. (Field notes, 14.3.2010)

When I later asked some women of Wojnie and Woglo during FGDs about their contribution to meetings like this, some of them said that their husbands were discussing about such issues with them at home – thus they were indirectly involved in decision-making, but they would not feel comfortable speaking out themselves in public. Other women said that their husbands would never discuss such matters with them.

One of the activities discussed in meetings in Ambober was the Sustainable Resource Management Program in North Gondar (SRMP-NG) project that was linked to the exclosure projecet (EP). This project was perceived very differently by different people in Wojnie and Woglo. Many had not heard about the project at all. Most striking was that women in both Wojnie and Woglo during a FGD knew about neither the SRMP-NG nor the exclosure project.

> There is no project. […] Only the agricultural office, there is no project. Previously there is a project. (Female farmer, Wojnie, FGD, 17.6.2012)

Some people had a high appreciation of the project and a lot of knowledge about and from it. They particularly appreciated the possibility of getting access to new breeds such as cross-bred dairy cows by subsidised credits. But others claimed that poor people were excluded and only rich people benefited. I had a particularly striking encounter one day, when I interviewed two very different farmers in two proximate households: a female farmer in a poor household, and then a rich model farmer.

> There are some people coming to Ambober and they don't usually come to our village, and if they call us for a meeting, we will go there. But we have not benefited from these people. We just participated in their meeting and they will tell us why they are there. Only the rich people are benefiting from the activities of this people. If they bring new technology or breed, they usually give it to the rich. (Female farmer, 65 years, Wojnie, interview, 15.1.2011)

There are such types of meeting where the development agents are calling the farmers to attend. These meetings are mandatory, and some farmers indicated cautiously that not attending such meetings could potentially have negative consequences for the farmers in terms of service provision (e.g. access to fertilisers). The perception that new technologies were primarily for 'rich people' was also expressed by other farmers during interviews in Ambober: the model farmers apparently received technologies first, and were expected to implement those as a show-case. However, other farmers (not model farmers) complained that they could not get access to improved seeds and fertilisers when they needed them. Some said that there were some farmers (who were not poor) who received technologies for free while others were expected to pay or even take a credit to receive them. These issues were

described in very different ways by different people, depending on their position in relation to those in power. The farmer below was a model farmer, and he saw access to project benefits very different from the farmer quoted above:

> All of the farmers are not now poor, they at least cover what they need. Since the start of this new regime to Ethiopia, I have been using improved varieties of teff, wheat, sorghum and maize and I am getting much. I can say that I am a very rich man. And when in the start of the watershed project, the project comes up with an improved cattle, and it was paid 3000 Birr[20] to get an improved cow, and now it is about 1 and half years and with this year I have a bull from that cow and it can be sold now for more than 3000 Birr. We were selling milk to Ambober in every mornings and got money and it can cover some of the costs in my home. Now the cow is again pregnant. (Model farmer, 65 years, Wojnie, interview, 15.1.2011)

This farmer was described by others as 'tenkara gebere', as a strong farmer with a lot of knowledge about tree and soil management. He was also a model farmer, and very confident regarding his knowledge and achievements. He showed however little consideration for those less prosperous, not even for his immediate neighbours. Many farmers in his direct neighbourhood were very poor farmers. He mentioned that he always got access to improved seed varieties since the new regime (EPRDF) came to power – this was most likely due to the fact that he was a model farmer. As a rich farmer with good connections to the authorities he could use the benefits of the SRMP-NG project (he calls it 'the watershed project'). Another farmer, a lady living in another part of Wojnie, told us that she could not buy a cross-bred dairy cow with the 3000 ETB that the project offered for this purpose. She could only buy an indigenous breed, because the other ones were more expensive. For her the modern technology remained out of reach.

Model farmers closely cooperate with the DAs. The model farmers receive information first and are then supposed to pass it on to the others. The DAs in Galessa and Ambober were often referring back to them, and some of the farmers whom I met more frequently in the beginning were also from this group. They were usually the ones who first made contacts with the outsiders and were often used as 'key informants'. Model farmers stay more or less the same over time, while DAs change at least every four years and often more frequently. Model farmers have a certain authority because many of them also hold political positions and other social functions in their villages. Thus their ways of knowing can be influential. They play an important role in knowledge sharing and learning processes within the communities as, like the contact farmer in Galessa, they are the first ones to receive information from outside

[20] 3000 Birr were equal to about € 133 at the given date.

organisations. They are also called upon to demonstrate successful farming practices to visitors. In Ambober the role of the model farmers was more prominent than in Galessa. In Galessa the results of the village mapping indicated that the proportion of rich people in Ambober was higher than in Galessa. During my research I encountered several very successful farmers in both Wojnie and Woglo who were considered knowledgeable, innovative and rich by other farmers, and most of them were also considered model farmers. To find out how one really becomes a model farmer I asked model farmers themselves:

> Farmer: Before the coming of these new technologies, I was doing my farm on a good way. I was ploughing my farm, sowing, weeding and harvesting in a good way. I was constructing terraces by myself before the government told us to do terraces. I have so many trees and *geshos*, and I was participating in seedling production of especially *gesho*. So the people know that I am doing in a good way. And so that when the development agents were selecting the model farmers, they know how I am handling my farm, and they select me as a model farmer.
>
> Birgit: What does it mean to be a model farmer? What kind of responsibilities do you have from that?
>
> Farmer: It is not just for myself. It is not to come out of poverty only for the family, we were showing the ways to get good production to the other farmers, we are training the other people, we are telling how we are successful. We are teaching the people how they can be productive.
>
> (Model farmer, 65 years, interview, Wojnie, interview, 15.1.2011)

He explained that he had been selected because he was a successful farmer. He understood his role as a mediator who demonstrated technologies to other farmers. The DAs in Ambober explained that the selected farmers were given training, and they attended a demonstration on how to use the technology to be adopted. This happened on their farmland and their homesteads. The model farmers were also responsible for disseminating this knowledge to other people:

> These farmers who adopt the technology will even help us for the fast dissemination of technology, because they will tell for the other farmers in public places, meetings and farmers days.[…] Another area, like when we want to work in livestock, the bee hives or cow may be given with loan and we select those who can repay the money and we train them. After that, they will tell to other farmers what they benefit from in Senbaté, meetings, church and other places which they can meet. (DAs, Ambober, interview, 12.3.2010)

However, as the DAs pointed out, this system excludes poor people because they cannot afford to take out a loan. In reality the model farmers often do not have to pay if they agree to try out new technologies. The fact that new technologies are often costly keeps many farmers

from following the advice given by the DAs and the model farmers. Taking such risks, often without much evidence, is beyond their capacity. Many farmers in Ambober expressed the wish that knowledge should be brought to them in different ways. They would like to have more experiments on farmland in their area, where they can see for themselves if the new technology is working or not. As the soil in Ambober is diverse and different from the research centres' experimental plots, new technologies often fail and the farmers lose not only the investment but also the crop for the year. And they complained that after those official meetings no one came to follow up on what was happening with the technology and to advise them on how to implement it in practice. Regarding adoption, the DAs in Ambober had their own theory on which they based their selection of model farmers:

> There are three different types of farmers. Some of them are fast to adopt, others are medium and there are farmers who usually afraid to adopt technologies. We will go to their farmland, or homestead, and we will see how they are working their farming activities and we will discuss with them about new issues, new ideas, and if they are looking fast and adoptive farmers we will select them and we will train them on the new technology. We can use these people to communicate technology. (DAs, Ambober, interview, 12.3.2010)

The function of the model farmers is thus also to become the extended arm of the government extension service – they will try out new technologies brought to them by the DAs, and they will show other farmers what they are doing in order to convince them to implement these technologies as well. However, as several non-model farmers pointed out, it was often difficult for them to implement these new technologies. During my time in the field, farmers were frequently called to meetings to be told to increase production to reach politically agreed targets set out in development plans such as the GTP. And parts of them were interested and in principle able (regarding the investment in agricultural inputs) to follow these directions. But then they often did not get the inputs (seeds, fertiliser) when needed, which was a source of frustration to many of the farmers in Ambober.

4.3 Comparing Ways of Knowing of Farmers and Scientists

This comparative section about ways of knowing of farmers and scientists looks at some of the aspects of their knowledges that met in the case studies on tree and soil management. The relation of farmers and scientists remained characterised by their professional distinction in the case studies – although many of the scientists I interviewed had a personal background with some attachment to farming or life in rural areas, and many of the farmers I interviewed carried out their own experiments on their farms (in trying out different crop and tree combinations for example). Not all scientists, and not all farmers, fit into these broad

categories. The differences between farmers were particularly obvious in 4.2.4. - there power played an important role in the exclusion of different farmers. As Tew et al. (2006:8) assert 'life experience of subordination or exclusion (as a woman, a Black person, a mental health service user, etc.) can give people greater knowledge about certain realities that those in positions of relative power and privilege cannot easily know about in the same way, because they lack that life experience. This can be knowledge of 'what is' and also knowledge of 'what is important' […]'. This was not reflected in the case studies, where farmers were treated as a homogenous group. In addition, the scientists in the case studies could not always take into consideration the diversity of knowledges and ways of knowing among the farmers they were working with in the case studies. It was easier for GR because the GWP was working much more closely with the farmers and the Farmer Research Groups (FRGs) were a good method to encourage farmers to share their ways of knowing and knowledges with other farmers and with the scientists. The scientists also benefited from that, and several scientists told me during the interviews that they had learned something from the farmers. An example mentioned by several scientists was the way of pruning *heto* into growing a pole within relatively short time that was practiced by some farmers in Tiru (Galessa). The farmers appreciated this way of learning about new technologies, which they could see for themselves on their farmlands and assess through observation whether they were working or not. This way of demonstration also enabled all members of the villages to observe what was going on, rather than only a selected group of informed farmers.

AR's project, on the other hand, was short and the time for interaction in the field was limited. He had to dedicate a lot of time to taking samples for his research. Thus, the ways of knowing of farmers and AR could not really intersect during this project. Some of the farmers who were closer to him benefited from observing what he was doing. In this way they came to understand better what benefits the exclosure could bring to them. One example is this farmer and priest who was also the guard of the exclosure:

> I think it [the exclosure] will change to good. We have seen the start of the closure area. And it looks good. And I expect it will cover with the forest, because when the area is closed many animals and birds will come to the area. If birds sit in the branches of trees, there will be more trees in the area and it will grow fast. And the closure area will have grasses so that it will be sold to the society that is again a benefit. And we planted fodder trees in the terraces we constructed, which have valuable outputs for animals. So this closure area has many advantages for us. (Farmer and priest, 30 years, Wojnie, interview, 9.3.2010)

This statement reflects the narrative also inherent in the exclosure management approach (see 3.3.3). He repeated what he had heard from the SRMP-NG project and AR himself. As the

guard he had an interest in maintaining the exclosure, he was the only one who gained a stable monthly income during the project period. When asked what the birds were contributing, he specified:

> If birds chew the fruits of trees, and swallow that, the seed will come out with their excrete, and it will grow, and even it is the best one to replant it again. (Farmer and priest, 30 years, Wojnie, interview, 9.3.2010)

Living next to the exclosure, he can observe the role of birds and how trees regenerate. AR spent some of his research time in the exclosure observing birds and counting the different species to assess their contribution to tree regeneration. This is an example of where a more sense-oriented approach to ways of knowing assisted him: AR's supervisor told me that for a long time there was a myth that the soil seed banks of Ethiopia's remnant forests were devoid of viable seeds for regeneration. In fact it seems that a lot of tree regeneration is actually dependent on frugivore birds and that at least some farmers were already aware of this before. This farmer lives far from the exclosure, but he shares similar observations:

> I planted eucalyptus, *gesho*, *shiwaha*, and some olive trees. I did plant some of the trees and others grow by themselves, as what we call '*wof zerash*' (sowing by birds). If they are grown by themselves in my farm, I will fence and protect the trees from livestock. (Farmer, 53 years, Wojnie, interview, 29.3.2010)

He was one of the farmers in Ambober (CST2) who planted trees and protected natural regeneration of trees on his land. His statement shows that he is aware of how natural regeneration works, and that he observes well if there are trees regenerating on his land.

In Ambober the farmers' observations quickly led them to discover an unexpected new benefit of the exclosure that also brought back childhood memories:

> We had a real dispute at the beginning amongst ourselves and with the Government. After that, we realize the benefit of the exclosure. We are happy to see wild goat and wild bird which are edible. It reminds us to the first times, to the good times. (Farmer, AR's farmer FGD in Ambober, 11.10.2012)

The scientists were happy to see wildlife returning for reasons of biodiversity and conservation. But for the farmers the returning wildlife also meant an additional source of food. This is an example of how ways of knowing, knowledges and perceptions can be closely interrelated and lead to different framings between different actors.

A personal experience I had reminded me of how difficult it is for people to meet on neutral ground in an environment influenced by an oppressive political system over generations. The

farmer quoted below welcomed me in a friendly manner and was very polite, however later on he told me that he was wondering about our visit and why we had selected him for an interview:

> Farmer: It is my first time to meet researchers, and I heard that you are here yesterday. And I think that if the questions they may raise are according to my knowledge, I will reply for them, and if they are beyond my capacity, I will send them back. And I do have a plan, I want to go to T'adda, but I just wait you to see what you are coming with.
>
> Birgit: Well thank you very much for sharing your knowledge. It has been very interesting for me. Do you have any questions to me?
>
> Farmer: I don't have the capacity to ask you a question. But I am wondering why you select me. Who send you to me? Is that because he thinks he can answer every questions, and he can handle everything, or he is doing very illegal work, so that he should be accused. I am very poor and am always focusing in my work.
>
> (Farmer, 50 years, Woglo, interview, 30.06.2010)

I then explained to him that he was selected randomly based on the criteria we defined after village mapping. Like many other farmers during the interviews he told us that he had not met researchers before. I realised that many of them perceived the researchers like AR and AR-DS as extension officers from the *woreda*. His honesty indicated to me that in a situation where he did not get the opportunity to ask a question back, he would probably be left wondering why he had been selected. This would have been a source of worry for him, as his comment on 'illegal work' showed.

The farmers explained to me that to assess the quality of the land they would look at it and observe what was going on there throughout the year. But most scientists working in Ambober and Galessa came for a short time and took away samples or the farmers' answers to questions. This was not the case for AR and GR, who visited the sites repeatedly. Still many farmers expressed uncertainty about what AR and GR wanted to do with whatever they had taken, such as samples from their fields or forests, or their knowledges about farming practices. Some even had concerns about whether this might lead to negative consequences for them. One of the Ethiopian scientists I interviewed described her experiences with soil sampling in the field:

> The farmers, sometimes it is very funny for them. They asked me one funny question I remember... when we were very young, so we have to play with soil and something like that, so you are always dirty, so then, why are you digging all this pit thing? I am just answering, I have to take the soil samples and study what is the chemistry inside. Ah, and how much the Austrian government is paying for you to do this? Then I tell them. [smiles]

> This is huge money! You could have, you know, opened one big shop and no need to play with the soil. But they are also very curious. Because when you tell them, I have to study the soil properties, because we human beings need food, that's why we grow, that's why we are healthy, so God also needs soil, nutrients, and all these things. So now I am studying the fertility status and the condition of the soil. So if it is not in a good condition, I have to recommend that you need to put some fertiliser or something like that. Ah, okay, now we know, very good thing. Ja, so you have to tell them like this, and they will believe you. (E-Scientist, female, interview, 22.7.2009)

For the scientist it was a normal procedure to take soil samples for analysis. This is what she learned to do in her studies and her work. It was new for her how the farmers were looking at what she was doing – she was already removed since long from the social world of her childhood. She grew up in a semi-rural environment. The farmers were puzzled that someone of her status and education would bother with making her hands dirty with the soil, and that she got paid for doing so. However, when she explained what she was doing in a different way the farmers showed appreciation for her work. The explanation that her studies contributed to understand how to improve the productivity of the soil was received positively. This explanation addressed the farmers concerns and needs. That she would be able to tell them if they needed fertiliser or not was important information for them. Fertilisers are not easy to get, and they are expensive as well.

Farmers who have site-specific and experiential, practical knowledge were acknowledged as experts by scientists, DAs and extension officers during interviews, especially model farmers were seen by many as experts; some even say they can be scientists because they can also experiment, which would make them 'at least' researchers. But the scientists in particular became confused when they were talking about it: on the one hand they seemed to feel that it was appropriate to call farmers experts or even scientists, but on the other hand the perceived differences in the ways of knowing of farmers and scientists confused them:

> You know, I cannot define that the farmers are scientists but [...] eh, I cannot simply say, but farmers with the knowledge what they have, they are also scientists. Because they know what to do, but the problem is that sometimes they cannot see something what was happening before or what is the possible consequence in the future. This type of thing is lacking with farmers. Otherwise farmers are a scientist, or researcher. Because from the experience they know how to manage their resources and how productive could that be. (E-Scientist, interview, 2.11.2009)

In the scientists' understanding, farmers' ways of knowing are more experiential than logical and analytical. Farmers, according to the scientists, have a good knowledge of their farming system, and in their specific management practices, and they have life experience in this. In forestry, farmers can tell the scientists when tree species are flowering, when seeds can be

harvested, how they regenerate – this knowledge can be 'used' by scientists who then recommend management strategies. Specifically, when it comes to new species the scientists can advise farmers how to use them. The colleague above brought another example from plant pathology:

> […] for example in my study they said, there is an insect which attacks the leaves of the plant, and they may not know the control strategy of that. As a scientist, we researchers recommend based on which damaging stage is it: the larval stage, is it the adult stage, when will it appear and this type of thing, analysis you can do for the future. And this, this type of thing is lacking sometimes from the farmer point of view. But you can make farmers researchers more in practical aspects. Theoretically we scientists we can read a lot of things. The problem with farmers is that their knowledge is confined to their locality. They cannot think beyond their scope. (E-Scientist, interview, 2.11.2009)

He then pointed out another difference in their ways of knowing: most Ethiopian farmers are still illiterate and even those who can read have little access to technical literature. Most of the work of scientists is published in English; few publications are available in Amharic, and even fewer in Oromiffa. Another point he was making here was the issue of place: by reading and travelling the scientists can access information from different parts of the world, and thus they have more information about wider, global connections such as the issue of climate change.

Farmers' knowledges on the other hand are enriched by knowledge transmission from previous generations and by their observation skills and practical experiences (see 4.2.1). Nevertheless, the examples highlighted from forestry and plant pathology show how scientists imagine that farmers' ways of knowing can interlink with scientists' ways of knowing – in spite of their doubts about calling farmers 'scientists'. And they show that based on experiences in their own social worlds, often in their childhood, some of them appreciate that farmers' ways of knowing have their own value, which cannot be matched by scientific knowledge in some cases:

> If you see my birth place, you know it is very, a very stable terrace land. When I asked my grandmother, she told me her grandfather told her that this was constructed by their ancestors. You see, centuries, long years ago, that terrace was constructed, but still stable. That practice, the farmers they are practicing, they are very experts for terrace construction, but me, if I construct that terrace, maybe I measure on every angle, and you know the, what you call the line, maybe it is far or not, but next year, it may destroy, by flooding, by other things. […] But most scientists they learn from their family, their farm, from their ancients communities. So farmers can be scientist. Even if they cannot write their names. (E-Scientist, interview, 5.3.2010)

This was one of the rare cases where it was clear that a scientist was making a linkage to his own family and social world when talking about farmers, even though many of them had such

a background. He told me an example of traditional terracing which is rarely mentioned in this part of Ethiopia. And he acknowledged that he himself would not have been successful in copying this technology, because he did not have the knowledge to do so. Unofficially, in personal communications, there were many scientists who told me about their appreciation of farmers and their knowledges. But in public speeches and presentations the 'we have to make them aware, we have to teach them' phrase was the more dominant one. And there were also other scientists who no longer had a connection with rural farm life, and whose work did not take them to remote areas. Some of these scientists were teaching at universities or working in centrally based research centres. As mentioned before, the incentives to go to remote areas for research are low. Such scientists not only find it hard to relate to the social world of farmers, they also show little appreciation for their ways of knowing. Farmers, however, did not differentiate scientists from other outsiders but merged them with the group of government people coming from outside. Thus they also saw them as government authority representing such interests.

AR and GR had a firm belief in empiricism, rationality and facts. Their training background was similar, but their social worlds were different, and so, of course, were their personalities (see 3.2.2 and 3.3.2). AR had a much more emotional approach to his work, while GR appeared more controlled and rational. Both of them tried to work with local farmers, but the interaction of AR with the farmers was characterised by less authority as compared to GR in my observation. However, both of them were perceived as government representatives. The farmers saw them in a different category from themselves, although both of them grew up in semi-rural settings. So it was not from their origin but through their education and consequent status that they became 'different people'.

This education left a big imprint on them. To understand the farmers' realities is sometimes challenging. Their supervisors advised both AR and GR to use social research to learn more about the farmers' priorities and needs. But they were uncertain which methods to use. The common way of collecting data on social aspects of farmers and their knowledge and practices was to collect household questionnaires and by organising FGDs, which were in fact group meetings, sometimes also village meetings. Using qualitative approaches alone did not seem sufficient to them to obtain valid empirical data for their thesis. After consulting a social scientist at BOKU, AR developed an interest in this type of research, specifically in social network analysis and social capital, and he applied some of it in his thesis.

Farmers directly mentioned only a few tree species when asked during interviews, and mostly the economically most important ones. Thus it was difficult to access farmers' ways of knowing about trees by asking them interview questions only. In my research I repeatedly had the experience that farmers always had a much larger diversity in their homestead gardens and in their fields than they remembered when we were sitting inside the house. Only when we went on a walk would they start mentioning and pointing out a much larger variety of tree species and their uses.

Most farmers grew about six to eight different species around the house (taxonomic and local names in Appendix 5), but the actual diversity was much higher than that. In Galessa the total number of trees and shrubs mentioned during interviews and homestead visits was 48, and in Ambober it was 67. Even though the villages that were part of my research were not far from each other, there was a difference in tree species composition. Table 4.2 shows that farmers in different villages knew and cultivated different tree species. These differences indicated preferences partly influenced by agro-ecology, the history of land use and the influence of the projects. In the case of Woglo and Wojnie, the differences relate more to agro-ecology: *gesho*, for example, does not grow well in most parts of Woglo, but thrives especially in the upper parts of Wojnie.

Table 4.2: Frequency of mentions of different tree species by farmers during interviews and homestead visits in all compared villages.

Tiru		**Sombo**		**Abeyi**		**Woglo**		**Wojnie**	
Hagenia ab.	9	*Eucalyptus g.*	6	*Eucalyptus g.*	10	*Eucalyptus c.*	15	*Eucalyptus c.*	20
Dombeya t.	8	*Dombeya t.*	5	*Hagenia ab.*	7	*Olea e.*	15	*Olea e.*	18
Eucalyptus g.	8	*Juniperus p.*	5	*Dombeya t.*	6	*Cordia a.*	14	*Rhamnus p.*	17
Chamaec.s p.	7	*Hagenia ab.*	4	*Juniperus p.*	6	*Croton m.*	13	*Croton m.*	16
Acacia d.	6	*Chamaec.p.*	4	*Senecio gigas*	6	*Ficus th.*	12	*Ficus th.*	16
Buddleia p.	5	*Arundinaria alp.*	4	*Tschotschinga*	6	*Acacia a.*	11	*Acacia a.*	15
Cupressus l.	5	*Buddleia p.*	3	*Cupressus*	5	*Rhamnus p.*	11	*Cordia a.*	14
Rhamnus p.	5	*Cupressus l.*	3	*Rejii*	5	*Euphorbia tir.*	6	*Albizzia sch.*	6
Juniperus p.	4	*Acacia d.*	3	*Buddleia p.*	4	*Carissa spin.*	6	*Carissa spin.*	6
Ensete v.	4	*Senecio gigas*	3	*Chamaec. p.*	4	*Prunus pers.*	6	*Euphorbia tir.*	6

Note: Listed to frequency ten only.

Some of the tree species mentioned by farmers were classified as 'exotic' by scientists, for example, eucalyptus and *Chamaecytisus*. These classifications were not applied by farmers. Eucalyptus has been grown in Ethiopia for more than 100 years, and it has become an economically very important tree for the farmers in the highlands. Many farmers both in Galessa and Ambober pointed out the problems that eucalyptus can cause when badly managed, but at the same time they also explained how they were using eucalyptus without causing damage to soil and crops. It is one of the main sources of cash income for farmers and also the most important construction wood. The GWP has been promoting tree species called 'indigenous trees' by the scientists over the last ten years, and many farmers have started growing such trees in their homesteads when they could get seedlings from the project (e.g. *Hagenia*, *Dombeya*, *Buddleia*). Some farmers, however, had been growing such trees by themselves, and they also knew how to propagate them. Some of these trees are also known to be growing at *adbar* sites, and therefore have always been familiar to the farmers. But poor people had a stronger focus on eucalyptus, if they could grow any trees at all: poverty in Galessa often means lack of access to land. And without access to land, planting trees is not an option. This shows that farmers and scientists had different interests in trees. It also shows that many farmers prefer eucalyptus, but still they know and grow many indigenous tree species at the same time. While many scientists were quite sceptical of eucalyptus and would have preferred to see more indigenous tree species, the farmers decided on the tree species based on their needs and the availability of seedlings. The differentiation between exotic and indigenous was not applied to eucalyptus, but only to specific trees for example juniper and cedar. The farmers in Galessa called juniper '*gatira*' and cedar '*farendji gatira*', foreign juniper, because they are both conifers.

In Ambober the diversity of trees and shrubs was even higher than in Galessa. And even if there had not been a project to promote tree growth in the homestead gardens most farmers were still growing a variety of trees next to their homes. However, as in Galessa poor people cannot afford this. They also know about different kinds of trees, but without access to land there is no tree planting. But in Ambober there are still areas of public forest land and grazing areas that the poor are also very familiar with because they are using these areas for charcoal-making. This is illegal, but it is one of the few sources of income for people without land. Eucalyptus is also lacking in Woglo and parts of Lower Wojnie because of termites that attack the tree.

Women during interviews and FGDs expressed only a few different tree preferences from the men. They also preferred trees that grow fast, and that could be used for making a variety of household materials. But female-headed households tend to grow more *gesho*, as it is also a good source of income. The dried leaves can be sold to produce *t'ella*, and they are also needed for household consumption. Women also emphasised that they knew much more about how to grow trees than men, because they were the ones, together with the children, taking care of the trees in watering and protecting them.

While farmers have to be familiar with many trees and shrubs in farming environments as complex as Galessa and Ambober in order to cover their household needs and to make use of all available ecological niches, a scientist usually has to decide on a smaller number of tree species to study because scientific ways of knowing are time and resource consuming. Their categorisations and naming systems follow international conventions, and in some cases farmers mentioned tree names that I could not find in literature nor could my Ethiopian colleagues tell me which tree it was according to international nomenclature.

AR selected *Olea europaea* subsp. *cuspidata* and *Schefflera abyssinica* to study fecundity and dispersion patterns. He was interested in finding out more about vegetation dynamics around churches and farms, and also looked at restoration of degraded lands by establishing the exclosure. GR selected *Senecio gigas*, *Hagenia abyssinica*, *Dombeya torrida, Buddleia polystachya* and *Chamaecytisus prolifera* to study the contribution of trees and shrubs to soil fertility and their potential as fodder species.

The reasons for scientists to select certain tree species are different from the farmers' priorities. Both scientists tried to take that into consideration and also did tree-ranking exercises with the farmers, but the trees finally studied only partly matched the top five trees on farms. GR made his selection based on the fodder potential and the potential to provide nutrients for crops. He argued that there was only scarce scientific information about these trees regarding the aspects he was interested in (soil fertility, fodder). AR selected his two main tree species 'because they were dominant and upper canopy trees in the church forest. Besides they have high economic value for the local people' (AR 2012:17). Later on in his thesis he is looking at dispersal patterns, and both trees are frugivore, thus birds play an important role in the regeneration of both trees.

The selection of trees followed discussions with their supervisors, and the trees' potential to provide answers to the research questions asked was an important criterion for the final decision. Farmers first of all looked at economic aspects: the price of timber, the potential for pollarding and fast regrowth, the use of the trees' components on the farm and in the household, propagation and regeneration in homestead areas, and then aesthetic values, shade, soil fertility improvement, potential for storage of crops in the crown. It was clear that the scientists applied different criteria from the farmers to rank trees, and these choices also reflected their different ways of knowing. Ultimately a scientist and especially a doctoral student always has to make a compromise between the available trees, their potential to answer his research questions, the preference of his supervisor, previously published work about these trees, and the preference of the farmers. AR and GR could include at least some of the trees preferred by the farmers. But as scientists are also forced by their institutional systems to give priority to scientific and institutional criteria, the farmers' preferences are often hardly considered at all.

4.4 CONCLUSION

This chapter has shown a range of ways of knowing that existed among farmers in the case studies as examples of alternatives to scientific epistemologies. It also showed how social worlds influenced the ways of knowing of different actors, and provided a comparison of some examples of farmers' and scientists' ways of knowing.

Many farmers made reference to the past when talking about tree and soil management (4.2.1., 4.2.2.2). They mentioned either experiences in the different regimes of the country, starting from the time of Haileselassie, then the Derg regime, and finally the EPDRF. Or they referred to observations and learning experiences in their childhood, when learning from parents or grandparents (4.2.1, 4.2.2.2). The case studies however did not look at the past; their focus was on the present situation, and the scientists were trying to make projections for the future based on the current status. The linkages of farmers to their past, either personal or as a community, were not fully recognised as important by the scientists. But these experiences and observations in the past had a fundamental influence on the farmers' present day knowledges, their value systems and their practices. The political, historical and social context of the case studies matters: for example coercive SWC measures in the past have shed negative light on such activities (4.2.1., 4.2.2.2). On the one hand farmers dismantled SWC after the fall of Derg, as some farmers reported both in Galessa and Ambober. On the other hand, during that time, some farmers observed which new aspects of SWC measures could be

important for them in addition to traditional technologies. They now apply these technologies - but not the ones which they deemed unimportant or not useful. One example were terraces with *gesho* instead of stones – this technology was applied by some farmers in Wojnie, like the model farmer mentioned in 4.2.4. This suggests that if such interventions had had a proper follow-up and evaluation, important lessons could have been learned.

Furthermore, the knowledge of farmers was very much dependent on the personal circumstances of the individuals, their life histories, their resources, political relations, opportunities and exposure to projects, and the potential to access projects (4.2.1 and 4.3) – for example female farmers during the Focus Group Discussion did not even know about any current projects in the area. Farmers knew a lot about tree and soil management, but they did not always act according to their knowledge. This is well illustrated by the example of some of the farmers in Ambober discussed in this chapter. The reasons are again manifold: a lot is based on historical connotations, but also current aspects of power struggles, exclusion, inequity, resource limitations. (4.2.1)

Trees and soil were seen as an essential part of life, a bit more so in Galessa where there was scarcity of trees, and much soil erosion, as compared to Ambober. It is also possible that the GWP had sharpened awareness for this in presenting the degradation narratives repeatedly, because in fact soil erosion is not new, and in the homestead areas most farmers are growing lots of trees. (4.2.1)

Spirituality plays an essential part of farmers' life both in Galessa and Ambober – although the roots and traditions are different between the Oromo in Galessa and the Amhara and Qemant in Ambober, there are also many similarities. Sundays and religious holidays are kept in both areas, and the religious holidays influence farming activities. The agricultural calendar of the year is oriented along the main religious holidays (Figure 4.8). The strong belief in their religion and God (although in different interpretations and name) transcends their lives. Farmers apply prayers and sacrifice to appease God and different spirits, angels, or refractions of God. The places for such prayers in Galessa are the *adbar* or Qallu ceremonies, in Ambober it is the church. If bad behaviour occurs among the community, the farmers ask for punishment: in Galessa this was expressed directly during a meeting where the offense happened, or by putting tokens in an *adbar* place. In Ambober the tradition says that punishment will happen through God and his helpers, for example the power of the *tabot* or the *qole*. But also the *zar* can exercise punishment. In both places punishment can be inflicted on others by asking for it.

In *adbar* ceremonies, but also in church prayers, farmers ask God for help in times of famine or drought, and also to provide sufficient rain. These prayers are taking place ritually at certain times of the year. In the perception of farmers in Galessa and Ambober, nature and technologies are thus manageable with the assistance of the supernatural. Nature *and* knowledge are God-given and God's knowledge is not open for questioning or debate. Based on this understanding, the farmers are acting intuitively rather than questioning God's will and knowledge - or following scientific epistemologies. (4.2.2.1)

The reference to past experience that I already discussed above has an additional component that is important for ways of knowing: implicit memories and emotions influence how we learn and act; the unconscious influences our rational decisions (Damasio 1994, Taylor 2001). Oppression and insecurity - in particular in terms of tenure - that the farmers experienced in the past regimes (and the present regime to some extent) influenced how people are dealing with technologies. In spite of the efforts of the EPRDF to improve tenure rights with a land certification scheme (see 1.4.3.4), farmers still distrust the promises made – this was sometimes expressed during interviews, but mostly during informal conversations when the digital recorder was switched off. While this feeling of insecurity was less pronounced in Galessa, it was more obvious in Ambober where the land certification procedures were still under way during my research there. The conflicting relationship between farmers and the state is historically grounded but persists. Because of this government protection of forests and government rules on other aspects of tree and soil management inflict feelings and memories that impact on management of trees and soil in negative ways. Scientists, DAs and extension officers interpreted the violation of such rules as ignorance or lack of awareness. (4.2.2.2 and 4.2.4)

In addition implicit memories of childhood influence present-day behaviour, values and actions: the example of the female farmer in Woglo is a particularly striking case of this. Her father taught her the value and importance of trees. As she had a lot of appreciation for her father, she also developed a deep love for trees and forests. She was known as a guardian of trees in her village: she would fight with people who wanted to destroy trees. Another example was a lady in Galessa – in her case the new situation she experienced after her husband passed away led her to become a very successful farmer. She started growing different vegetables and spices, and has improved her livelihood substantially. She was very proud that she had achieved all of this by herself, without her husband. (4.2.2.2)

The complexities of languages and knowledge became obvious during a field day in Galessa and a workshop in Addis Ababa. The organisers and participants in these events were struggling with the fact that there were three different languages spoken by the participants without any organised translation between them; additionally it was a meeting of farmers and scientists whose differences in ways of talking and presenting created another barrier. While the farmers would speak freely in their fields, the scientists used PowerPoint presentations and scientific terminology in a conference hall. Their language was often interspersed with English vocabulary, even if they spoke Amharic. The latter was an issue embedded in the rules and norms of the different social worlds these farmers and scientists belonged to. Regarding the issue of different languages as such, the fact that language and ethnicity are tied in Ethiopia (although many people speak Amharic fluently in addition to their native language) makes this a politically very sensitive issue that no one among farmers and scientists wanted to address openly.

The geographical distance and the fact that only few scientists could speak directly with the farmers in Galessa – in fact only the technical assistants, and one scientist who understood a bit of Oromiffa – made it difficult for scientists to understand some of the processes going on in the community. They relied on a spokesperson, the local contact farmer (see 3.2.6). However, during my research it became obvious that he had started to take advantage of this role. He excluded people from project participation and benefits based on relations, ethnicity, language, and gender. While it may be comfortable and sometimes necessary to rely on such intermediaries, this nevertheless requires careful observation and attention, as this case shows. (4.2.3)

Exclusion is a topic particularly affecting women in both Galessa and Ambober. In the case of Galessa two women were affected by the exclusion from the project because they could not afford any labour contribution. In Ambober the society does not allow women to be outspoken and assigns a passive role to them. Exclusion also affects some of the poorer farmers in Ambober. Particularly those who do not have access to land are struggling to supply for their families. They have neither time nor other resources to contribute to social institutions and other community services. This however deprives them of the access to information and knowledge, and as a consequence of other opportunities. There exist also different perceptions on access to resources such as project support and extension services and the possibilities arising from them between some of the model farmers and some of the poorer farmers in Wojnie. The role of model farmers was not addressed in Galessa, however in

Ambober it was a prevalent topic in both Wojnie and Woglo. The role of model farmers is to convey information, knowledge and the use of technologies to others. The idea is that their example will convince and inspire others to follow. In reality however the other farmers perceive a system of injustice. While model farmers are provided inputs, seeds etc. by the government, many of the others find it difficult to access those agricultural inputs. Model farmers are close to the development agents – they are also the ones the scientists were first introduced to as cooperative farmers. (4.2.4)

In the political context of Ethiopia extension work is highly political. One of the development agents' tasks is to represent the authority of the government and tell the farmers how to fulfil the national development plan, and to secure political control over Ethiopia's large and remote countryside down to the household level. The latter also impedes the efficiency of the extension system, as development agents and farmers often get side-tracked from focusing on their first goal of increasing agricultural productivity.

The comparison of ways of knowing of farmers and scientists revealed that the mutual perception of farmers and scientists was sometimes misleading. In Galessa farmers understood the role of scientists as representatives of HARC. There was long time cooperation between them and the farmers understood that scientists were bringing new technologies and advice as well as training for farmers. In Ambober the role of the scientists was unclear to many farmers – they perceived them as extension officers from the government. This perception as 'government' representatives potentially has implications on how the farmers interact with the scientists. On the other hand, among the scientists interviewed only few called farmers 'experts' without hesitation. To acknowledge the status of 'expert' in a farmer was difficult for these scientists. However, in the case studies scientists and farmers sometimes made similar observations of natural phenomena (for example in observing the seed dispersal by birds in Ambober) or the performance of technologies (for example pruning of *heto* in Galessa). In other aspects there were differences, for example when the exclosure in Ambober provided a habitat for returning wildlife, the scientists were happy about the increase in biodiversity. Some of the farmers on the other hand were happy because of an unexpected new contribution to their diet.

The relationship of scientists to farmers is sometimes complex: in some cases scientists also remembered that they were not always scientists, which helped to break up the dichotomies between farmers and scientists. In informal conversations several scientists expressed high

appreciation and understanding for the farmers' situation and their actions, however when I heard the same people speak in public, they would repeat the poverty - land degradation narrative (1.4.3.3).

The interaction between the farmers and the scientists in the case studies could have been eased if there had been less methodological challenges in the script of the projects. As both AR and GR did not have substantial training in social science theory and methods, their choice of methods was most of all influenced by the projects or the organisations they had been working for, or their supervisors. In the case of GR the influence came from his experience as coordinator of the AHI project INRM, as well as his study experiences abroad. In the case of AR his supervisor was instrumental in encouraging him to study social aspects. AR himself had an interest in social aspects, but his background was forestry. Nevertheless, from their viewpoint they were successful in establishing good relations with the farmers. When looking at the projects' documents however, and by comparing them with what farmers said during my research, I found that there were some gaps that could have been avoided if more emphasis had been given to social sciences in the projects. In both case studies the alternative ways of knowing mentioned above found little consideration and neither did power and exclusion. Women remained remarkably invisible in the projects' narratives – except for female-headed households who are a small minority in each community. The study subject was determined by AR, GR and their supervisors, who also designed the projects together. The diversity of species and the priorities from the farmers' viewpoints, the differences between men and women, rich and poor, influential and less influential, old and young farmers could have been reflected more with the help of social sciences. While the scientists consulted farmers on their preferred tree species, they eventually could not take those preferences fully into consideration. There were many other (biophysical) criteria the scientists had to consider. The scientists also had to compromise some of their idealistic ideas at the outset because they had to abide to the rules and strategies of their organisations, the research institutes Amhara Agricultural Research Institute (ARARI) and Holeta Agricultural Research Centre (HARC) in Ethiopia (see 1.4.5), and BOKU University in Austria, as well as the donor providing the scholarship (Austrian Development Cooperation) and the project funds (Commission for Development Studies - KEF).

The case studies provided a window of opportunity for acquiring new knowledge for both farmers and scientists; however, time and resource constraints limited the dialogue. The scientists missed an opportunity to broaden their ways of knowing, and also did not open their own ways of knowing to the farmers. Their social worlds intersect and also their ways of

knowing in some aspects overlap as outlined above: however their social worlds also prevent a further approximation of farmers and scientists who remain in separate groups. This separation is visible in how they arrange themselves during meetings, in their appearances, languages and modes of communication, in the way authority is used by one group to dominate over the other. Scientists' social worlds may be influenced by their childhood memories too, and some like GR may have developed an interest in their subject because of the surroundings they grew up in. But this does not necessarily enable them to better understand farmers' ways of knowing. The academic education that GR and AR went through has strengthened their belief in numbers and facts. Reason and logic are the dominant ways of knowing they abide to. Social issues are considered important, but acquiring knowledge about them should also follow the same scientific logic as ecological experiments.

While most scientists may share similar ways of knowing, there are also differences depending on each individual's life and his or her social worlds – yet most tend to accept the dominance of reason and authority. However, farmers have maintained much more varied ways of knowing – as valid in their understanding – relying partly on senses and language but also on more emotional and intuitive aspects such as spirituality or memories. However, there are also distinctions between ways of knowing that are voiced and discursive and others that remain tacit or silenced. This can affect the marginalised members of the villages: usually poor people; in many cases women; or people with difficult histories such as single women with children, often divorced or separated; children from failed marriages; or people of different ethnic background from the majority. Their ways of knowing and their knowledges often remain hidden, ignored by the powerful in their villages, and unnoticed by the scientists who most of the time cooperate with the powerful. Therefore the next chapter will look at broader aspects of power, framing and narratives about trees and soils in the case studies.

5 RELATIONS, PLACES AND REPRESENTATIONS

5.1 INTRODUCTION

This chapter will look at how power comes into play at different levels when different groups of actors encounter each other and negotiate. It uses the example of the Galessa Watershed Project (GWP) to point out how roles and resources were distributed in the case study, and how power structures were fortified or weakened during project encounters. The chapter highlights experiences made in the exclosure project (EP) as another case study with different objectives and possibilities from the GWP: while the GWP lasted more than ten years, and had several institutions as partner, the exclosure project lasted only four years and was carried out by AR and his supervisor only.

Gieryn (2000), in his review of the role of place in sociology, indicates that place as a concept can provide attachment and identity, and that place is connected to issues of power depending on who wants to occupy which place and for what purpose. When different actors come together to meet and discuss a research project and its activities, they also negotiate about the different ways of knowing. Relations, place and modes of representation, and the power relations performed through them, play an important role in such encounters; however, their importance is often not recognised by scientists involved in the research. This chapter explains how workshops, field days and other encounters take place and how they influence the interaction between farmers and scientists, and their ways of knowing. The power of place is illuminated, and also how the different constellations of actors and languages, symbols and metaphors used play an important role in the project choreography.

The projects have cultivated personal relations between the scientists working in the projects, the farmers cooperating with the scientists and other stakeholders such as the DAs. They have produced written artefacts, such as field manuals. They have put structures in place such as the exclosure or the community nursery in Galessa. They have provided physical meeting spaces, for example, in a workshop or a field day. Different modes of representation are applied in order to transfer information from one group of actors to another. And this information is passed on in standardised packages (Fujimura 1992) to reinforce common narratives and stabilise ‘known facts’ to manifest power and structures of domination. Fujimura (1992: 205) in her example of standardised packages in the very different field of oncology research explains: ‘Examining the construction, maintenance, and augmentations of

these packages will help us to understand not only how we came to have the representations we now hold sacred but also that there are other possible representations, other ways of knowing and practices.' Packages, according to her, are 'powerful tools for insuring fact stabilization' (Fujimura 1992: 204).

Yet, the large amount of data resulting from research projects is sometimes difficult to package. Some data seem uncertain, even unreliable, because the data collection method is not sound enough, but the results and scope for interpretation seem promising and interesting. And some results are potentially attractive for policy-makers to design new interventions. All of this requires some creativity to represent reliable data in a way that is scientifically sound and 'fact-based' (Porter 1994) and therefore convincingly represented. I take examples from the two case studies to analyse critically these processes of fact creation and quantification. Fact stabilisation by the use of numbers and quantification of complex realities is also an issue of power: it serves to enforce certain versions of reality, and 'it acts as a filter, which, if it clarifies, does so by removing impurities' (Porter 1994: 51).

5.2 INTERPERSONAL RELATIONS

Research projects bring together people with very different backgrounds and very different interests. The social worlds of those actors may be overlapping, but often they may have practically nothing in common and they meet by coincidence in the project setting. In the two case studies the relations between the farmers and the scientists became central: in the GWP, GR and the INRM scientists were seeking farmers' priorities and then their cooperation in realising solutions to solve their problems and unleash their potential in agricultural production and environmental and soil conservation. In Ambober, AR was also seeking allies in his quest to establish a research site that was at the same time intended to be beneficial to the farmers – yet at the outset they still had to be convinced that this was the case; repeated visits and meetings helped to establish personal relations with the farmers and finally some level of trust developed. Socialising on an informal level with the farmers also helped – and the occasional visit to a *t'ella bet* (a house serving *t'ella* to the public) convinced the farmers that this outsider had no reservations about spending time with them on an eye-to-eye level. In fact I had similar experiences: farmers often commented on and appreciated the fact that I was eating and drinking with them, and also staying in the area rather than returning to Gondar for the night. One of the other doctoral students from Ethiopia at BOKU told me about similar experiences when talking to farmers and also mentioned the risk that farmers might give you information just to get rid of you:

> They just reply for you whatever you want. But you have to be... careful, in a way eh, that you should consider the timing, because the farmers usually they work in their farm, so you have to... you shouldn't ask them when they were REALLY busy. So they just want you to go away, so they give you just any answer…so you need to just listen, and wait until they were free. So you have to be very polite and ask for the permission, and..., just, you have to be socialised with them. You have to eat what they eat, you have to drink what they drink […] But when you are DOWN to earth with them, they give you just any information. They are very happy to provide you any information. So in my case it went like that. I have to drink *t'ella* some times. Even I didn't drink with my mum's *t'ella*, but I have to drink with them. (E-Scientist, female, interview, 22.7.2009)

Both AR and GR told me that they tried to engage with the farmers in similar ways as described by their colleague above. They realised that the farmers they were talking to would have simply answered questions in a way that would have pleased them if they did not trust them – but they also assumed that this would not have been a true answer. Therefore they tried to build trust with the farmers they wanted to work with - in similar ways as described above.

In the GWP some of the scientists, and particularly GR, have become something like 'old friends' to some of the farmers. Over time, relations developed and improved, and the actors involved started to trust each other. Some of the research within the GWP also engaged with farmers' knowledge in order to complement scientific knowledge. Several scientists reported what they had learned from the farmers. There was one farmer, who later became one of the contact persons of the project, who started to prune an indigenous tree species (*Hagenia abyssinica*) on his own initiative. By doing that he improved its growth and timber quality, which was unexpected by the scientists. On the other hand, some practical experiments on-farm made scientists' ways of knowing also more accessible to the farmers. Some of the data collection in these experiments was carried out by farmers. For example, they collected the harvest from soil run-off experimental plots by measuring the harvest on differently managed land.

In the GWP the farmers were organised in Farmer Research Groups (FRGs) for most interventions planned by the project. Those interventions were developed by the researchers based on the results of the initial problem identification. The benefits of the spring and the improved seed varieties, especially of potato, and the possibility to participate in training, where they were paid for attendance, were very motivating for the farmers. However, in the end only a small proportion of the farmers could actually participate and benefit.

> Researchers came here and informed us that there is a training. A meeting was organized in order for people to choose farmers that have a capacity of attending a training and come

> back to their village in order to train the others. The farmers selected themselves who will go to the training. (Contact farmer, 30 years, Tiru, 26.01.2010)

The contact farmer claimed that the community decided who would attend training and get benefits from the project. In reality, however, he was the one who got first-hand information together with the local coordinator, and it was in his hands who would be informed about this. Other community members complained about this. They felt he was using this to his advantage, and that he was always the first one on the list of those nominated to attend. But the decision of who is to benefit is a difficult one. The scientists participated in such decision-making processes in the active phase of the GWP. Then they left this decision to the community, by channelling the information through the two contact persons. It is certainly not the poorest of the poor that gain access to benefits. On the contrary, I found that the project was reinforcing existing hierarchies as well as creating new ones (see also chapter 3).

In Ambober AR stayed in contact with the farmers following the initial discussion process. However, for the purpose of his doctorate he also had to go to Austria for extended periods of time, leading to disruptions in communication during his absence and interference by other actors who developed a stake in the project. To ensure the continuation of activities during his absences, AR developed a network of contacts on the ground that assisted him to follow up the development of the exclosure as well as his own field research:

> I was working with the different sections of the people living there, eh, I was working with development agents […]. Basically I was starting with the local people but through time build up to some government body. It is dynamic, and you start with someone and... For example the guy who I was working with, who was my assistant, happened to be a militia man, and it may not be a good impression among the farmers and...I should get an alternative one. And some people, youngsters, who were working with me, leave the area for a better life. Otherwise I was working with everyone who can assist me with something. The Kebele administration, especially the development agents and the Kebele administrative body was important for our work in institutionalising and in enforcing laws. (AR, interview, 21.2.2011)

Here he makes clear that on the one hand he managed to establish a good local network, but on the other hand the purpose of his network was to facilitate his work. I had the feeling that he cared deeply about the farmers, and that he was trying to work together with them, so I asked him again how the farmers were involved in his research:

> Very limited. I was eh...my encounter with the farmers was that when there is a group meeting or when we were working in the structures in the watershed, just they would see me, I am working with them[…] I feel that there may not be a clear picture who I am or for what purpose I am doing it. But people near to the watershed, and also the development

> agents, the others may not know why I am doing all this. I am an outsider. (AR, interview, 21.2.2011)

He believed that it was not clear to the people who he was and whose interests he represented. This impression was also confirmed by the farmers whom I interviewed: not all the farmers knew him, but among those who knew him many put him in the 'government' category; some people thought he was from the Woreda Office, others thought of him more specifically as a DA supervisor.

People coming from outside usually do not stay long in the farmers' places. For outsiders these are places outside their own social world that involve many challenges. Scientists named challenges such as long and difficult trips to the rural areas, where there is no hotel, no restaurant and no electricity. To them it seems infeasible to stay there to do research. Additionally, the research system does not provide incentives for exposure to such conditions.

While AR stayed often and for longer periods of time in Ambober, this was not the case in the GWP. Scientists and technical assistants alike chose to return to Ginchi, the next town, on a 15 km all-weather mountain road. Thus the nature of engagement between farmers and scientists was restricted by the fact that the scientists tended to arrive late in the morning and left early in the afternoon. Farmers on the other hand left their farm at around 7 a.m. and returned home after work at 6 p.m. - spending time with scientists would therefore lead to compromising their work time. Both GR and AR also 'appointed' farmers. That meant that the farmers were officially requested to be available at a certain time by the DAs. This way of calling farmers for meetings might have influenced their feelings about such a meeting. They would understand that the scientist was acting in the interest of the government, which might work to his or her advantage or disadvantage, but either way it might lead to some bias in the farmers' responses.

5.3 Places and Relations in the Case Studies

5.3.1 The Workshop – the Babel Dilemma

A workshop is one of the rare opportunities where representatives of most of the stakeholder groups of a project meet. The workshop described here was the inception workshop of a new project phase of the cooperation between the Holeta Agricultural Research Centre (HARC) (see 1.4.5) and the African Highland Initiative (AHI). Their role in the case study (CST1) is explained in more detail in chapter 3 (3.2.3). It took place at the headquarters of the Ethiopian Institute

for Agricultural Research (EIAR) in Addis Ababa. The workshop was an opportunity for scientists mostly from HARC and AHI to present their work. The presentations were about the work done in Galessa, but also about the current state of the art in their field, and the most important challenges with regards to upscaling and putting research into practice. The workshop was planned by the original team from HARC working in Galessa and old and new team members from AHI. The list of participants amounted to 51 people; however it was not a complete list. The participants were scientists from a number of Ethiopian research organisations – the majority from HARC - and seven visitors from Uganda and Tanzania, representatives of two *woredas* (government officials and both male and female farmers). There was also a group from Galessa Koftu watershed present. The latter two groups – government officials and the farmers except for two *woreda* officials– were not included in the official list of participants.

The heterogeneity of the group created a few dilemmas for the organisers. First of all, the programme itself was a challenge. It is difficult to find a set-up that provides scope for scientific inputs and insights into practice as well as giving enough space for discussions for all stakeholders. The aim of the workshop was not only knowledge exchange, but also the development of a draft implementation plan for upscaling technologies and the establishment of a multi-stakeholder platform.

However, one of the major challenges was the language. The significance of language to ways of knowing has already been discussed in 4.2.3, but in this workshop language conveyed different kinds of authority. The official language of Ethiopia is Amharic, but the previous project and the current one were taking place in the region of Oromia, where the main language is Oromiffa. In the end, for the sake of the international participants the slides were in English, but the presentations were in Amharic. This dilemma had the inevitable result that different groups emerged that communicated in their own languages rather than with each other. As pointed out below by one of the participating scientists whom I interviewed, the diversity of the participants made the workshop unique, but it also created confusion: scientists in Ethiopia often present their research in English at conferences and workshops, as I experienced repeatedly. In personal communication many of my Ethiopian colleagues also told me that they found it difficult to talk about their work in Amharic. According to one of the workshop participants whom I interviewed this was also a problem at the workshop:

> What is unique about this workshop is that you can find different people, starting from farmers who don't write and speak English, to high-level officials, and scientists. So it is nice on the one hand to come together and all this, and to discuss the issues. On the other hand I feel that these are scientific papers, it is sometimes difficult to explain. Because if it would have been in English, the presenters can speak a lot, and say things scientifically. But they are writing in English, and they try to explain in Amharic. Sometimes you can't see the flow of ideas. Because sometimes you cannot find the word in Amharic. That is why we were mixing English and Amharic. Otherwise it is good because you can find so many stakeholders and NGOs. (E-scientist, interview, 29.10.2009)

He believed that the workshop lost in quality and content because of the language confusion. He appreciated the diversity of participants of the workshop, but regretted that the scientific debate was negatively affected by the way the languages had been used.

During the workshop the language created barriers, especially for the international participants who spoke neither Amharic nor Oromiffa. The actual negotiation on the technologies for upscaling again divided the participants – four groups were formed: one group for scientists, who spoke partly in Amharic and partly in English, one group for farmers speaking only in Oromiffa, and the other groups of NGOs and government officials speaking in Amharic. Several workshop participants made similar observations regarding these groups, their members and languages:

> I feel that the workshop should be divided into two. At a scientific forum, like what are really the technologies we have at hand, and then how we can introduce those. That should be presented in Amharic or Oromiffa. You can discuss separately with them, and then with scientists as well. So people from Uganda and Tanzania, if you remember they were not following the workshop, if you remember, some people were out, NN was out, NN was out, because the presentation was in Amharic. Only a few words in the slides were in English. In any case it is good to start. Because our problem is, our farmers cannot speak English. If you go to Kenya or Uganda, they can speak English, because the farmers can speak English. But in our case, you cannot find farmers speaking English. Otherwise the workshop was good. (E-Scientist, interview, 29.10.2009)

This participant would have preferred to hold two different workshops for the different participants, one more scientific, and one more practical. In his perception the way the languages had been arranged excluded different participants at different times. In the case of the visitors from Uganda and Tanzania, some of them even left the room when presentations were in Amharic. It is however noteworthy that he regretted the farmers' inability to speak English rather than commenting on the scientists' inability to communicate with farmers in their own language.

It was not clear to me who the actual target group of the workshop was. On the one hand,

there were expectations on behalf of the visitors from Uganda and Tanzania to learn about the planned project activities and previous achievements, but also to present them as an organisation (AHI). Nevertheless, their expectation was also to include farmers in this workshop and to engage them in the discussions. This is an important requirement of many donors and other international organisations; it is supposed to be standard for research–farmer cooperations, although in practice it is often difficult to implement because not only do farmers and scientists use different languages in their everyday life, but also the way things are said, how knowledges and experiences are shared, the location, and the means of presentation are usually very different.

I perceived a contradiction in the actual set-up of the workshop: on the one hand it tried to meet the expectations of its scientific participants and, organised by scientists, it resembled a scientific conference more than a meeting engaging with a large variety of stakeholders in an interactive process. But it *also* attempted to be the type of meeting that engages with stakeholders, and this was difficult to achieve because of the whole set-up of the workshop as a scientific event, and because of the language issue.

Workshops follow certain rituals that distinguish the event from e.g. a field day that follows again other rituals. Denskus (2014:9) describes the rituals of conference presentations by giving an example of one of his own presentations:

> The PowerPoint slide in the background is entitled 'about ethnography' to help me explain better what it was that I was researching in Nepal. The circumstances (an international academic conference), the location (a seminar room without any hint of the location and even without daylight (the window blinds are shut) and the performance of me standing in front of the audience wearing a corduroy jacket to appear more professional and academic provided me with an interesting opportunity for reflection, in the literal way that it felt like looking into a mirror or watching the effect on television when someone is looking in the camera and the picture is duplicated on a screen in the background, getting smaller and smaller in the eternity of multiplication. Even if the contents of the slide may provide some critical input into the debates that we were having on the panel about the role of external actors in building peace and states in fragile environments, my performance as a paper giver at this conference is essentially replicating the expectations of presenting research and engaging with colleagues from around the world.

As Denskus (2014) describes it for peace-building conferences, this also holds true for other disciplines:

> […] in addition to working on 'real' social change, many critical concepts such as peace-building seem to have been absorbed by indoor rituals and events, replacing contested, public spaces 'out there' with the power of arranging, or in a Foucauldian sense disciplining,

> a group of professionals around a PowerPoint presentation, scheduled coffee breaks and a twenty-five page report. (Denskus 2014: 18)

At the AHI workshop I observed that the actual intention of the workshop to link up with project farmers (of the GWP and a new AHI project in another area) and other stakeholders (NGO representatives, *woreda* representatives, policy makers, other scientists,….) was pushed aside by the need to follow the workshop ritual. The participants, as in Denskus' example, gathered around the PowerPoint presentations and socialised and/or networked during the coffee breaks – and they asked conference proceedings at the final moment of the workshop. The workshop ritual however absorbed so much space by itself that it did not leave much space for the farmers to find their place in this ritual. The only moment when they gained visibility as presenters was during the presentation of group work on the implementation of the technologies on the second day of the workshop (5.4). The PowerPoint presentations amongst others featured a range of potential technologies for watershed management that the new project wanted to upscale. The purpose of the group work was to discuss which technologies the project should take up. The group work of the farmers was presented to the audience by the local project coordinator in Galessa, who gave his report about the group work in Amharic. However, the workshop did neither succeed to provide a space for the farmers to express real concerns about social issues and social change, nor to express their knowledges. This happened in spite of the fact that in the PowerPoints during the introduction the presenters, particularly those representing AHI, repeatedly pointed out that these were core issues of the project.

The workshop took place at EIAR. This is located in Addis Ababa on a small but beautiful campus with flowering trees, lush green grass and decorative garden plants. The contrast in terms of location to the social world of the farmers, where every square metre of land seems to be used for agricultural production, could hardly have been bigger. It took farmers and extension workers away from their own social worlds into the centre of the scientists' laboratory, their social world in language and venue. The English language is *the* scientific language, and the venue was a very scientific location, where the national elite of agricultural research meet. While it was familiar terrain for scientists, who used the coffee and lunch breaks for lively chats on the corridors, the farmers stayed among themselves. The scientists interviewed after the workshop all reported that they had had no or almost no communication with the farmers during this workshop. The workshop, although full of interesting events and presentations and generally seen as a success, failed in bringing different stakeholders together to negotiate, or exchange knowledge, views and expectations.

At the workshop, participation was decided by the scientists who had also decided on the venue and the agenda, and their role during the process was the most prominent one. Decisions were made during the two days of the workshop, but it was unclear who made the decisions and by which means. So, the workshop was a success in terms of most of its objectives as presented by the organisers. However, the apparent non-participation and deliberate self-exclusion of some participants indicated that they did not consider themselves as being part of the negotiation process.

5.3.2 THE FIELD DAY

The field day was part of the workshop mentioned above. It was a cheerful and relaxed day spent in Galessa after two intense days in the 'laboratory' of the scientists. The participants were mostly identical with those of the workshop. While the visitors from abroad were taken to the site in cars, the remaining participants went there by bus. Returning to their home seemed to return a feeling of empowerment to the farmers who had lost a lot of visibility during the workshop itself.

Farmers were the ones who were talking most of the time, either in making presentations, in asking questions to the presenters, or in casual conversations with the visitors from outside the watershed during the field walk. The watershed area was their own laboratory, their home and their village, and they seemed proud to show their achievements to this mixed audience of scientists from Ethiopia and abroad, *woreda* officials, NGO staff and farmers from another *woreda*. This pride was expressed through increased communication and body language; the farmers engaged with the scientists in informal conversations with a confidence that I could not perceive during the workshop. The presenting farmers used the space given to them, both physically (positioning themselves *in front of* the scientists) and orally (in long presentations) using their own language Oromiffa and sometimes Amharic, and using also traditional means of communication (the poem described in 4.2.3).

The day started at the community nursery, where a scientist explained the GWP and its achievements and challenges. It continued with a walk across the landscape, where participants were shown the achievements of the project in practice: trees planted and new seed varieties growing in the fields. Later, two farms were visited where the farmers themselves explained to the visitors what they had been doing to change their lives as part of the GWP. Their message could be seen, felt and experienced even without words. A particularly memorable scene happened during one of the farmers' presentations, during an

activity called ‘Visit introduced improved dairy cow and its management of a model farmer in the watershed’ in the programme:

> NN [scientist] is filming again, and walks around among the group, while I keep sitting on the floor, filming from there. His camera is also beeping sometimes, and I guess that might have been the reason for what happened next. NN walks around the farmer and the cow, and films from behind the cow, he stands a few meters away, and all of the sudden the cow turns around and attacks him. The farmer grabs the cow by her neck rope, and NN is safe, but everyone laughs about him. (Field day Observation Notes, 22.10.2010)

This scene is interesting because it illustrates in a slightly comic way how uncomfortable it can be for a scientist to find himself in the farmer's laboratory. The conditions change drastically. The sun is hot, there is no shade, no chairs, there are livestock roaming around freely. The scientists stand in a circle around the farmer who seems to enjoy the situation and explains at length about his activities and the project from his perspective (Figure 5.1). The farmer is very comfortable standing next to the cow – he knows her very well. This is his patch, and he uses the space given to him after keeping silent for two days at the workshop in the scientists' laboratory. Nevertheless, there is a process taking place that is invisible to the farmers.

> There are some questions asked by the audience, both scientists and farmers asking. NN [visiting scientist] reminds GR that someone should note these remarks and questions for the proceedings. During the day I hear NN doing this a few times. For NN it is important to document all of this, my interpretation is that NN needs to justify the expenses in the project towards donors as well, so the more evidence NN has, the better it is. NN repeatedly calls them 'our farmers', saying 'our farmers are model farmers', 'our farmers are really innovative'. I have the impression that for NN the farmers have become some kind of object, some kind of functional artefact, and they have come here to assess if this artefact is still working properly. (Field day Observation Notes, 22.10.2010)

Figure 5.1: Farmer and his cow in front of a group of farmers and scientists.

Figure 5.2: Meeting of nursery group, two farmers reading out names and work assignments for the new growing season.

On the way to the field, I overheard when a scientist in the car remembered childhood experiences. The scientist grew up in a farming environment, and used to work like the children of Galessa, so the scientist remembered herding the cattle, collecting the harvest and

assisting the parents in their daily labour. Observing the social world of farmers in Galessa brought back memories. Through those memories, the social world of the scientist and the farmer began to overlap. At the same time the scientists had to assess the project success, and they began to verbally appropriate the farmers as 'our farmers'. This seems to imply that they had become what they were now through the support of the project. Being able to demonstrate the success of this project was important in order to be able to demonstrate outcomes and impact – and this is what donors are asking for. The design of the day, the choreography, was planned by the scientists. Nevertheless, from the point of view of the participants the roles had been reversed, and the farmers became the presenters, the experts. The scientists became the listeners, occasionally supporting the farmers in their arguments.

5.3.3 The Meeting of the Nursery Group

The final contrasting example of moments of encounters is the meeting of the Farmer Research Group (FRG), specifically the Nursery Group (Figure 5.2). These meetings take place on a regular basis, with or without the presence of scientists, but usually together with extensionists. I observed three of these meetings. The group meetings are organised by the local project coordinator and a farmer from the community. These two people are also the contact persons of the HARC scientists, and most information, such as the invitation for trainings or the announcement of new events or technologies, is channelled through these two persons. In Oromo society there are social control mechanisms that aim at maintaining egalitarian collectivism, and if an individual is benefiting too much at the expense of others, these mechanisms will become active. In some ways the nursery group meeting is a platform for concerns in these directions. It is not directly acting as a social institution that ensures egalitarian collectivism, but at those meetings the group members openly voice their concerns and challenge the leaders.

At these meetings the interests of the scientists are now represented by the two contact persons. But inevitably they are also representing their own interests and the interests of those close to them. Power is visibly negotiated: voices are raised, and people demonstrate feelings of exclusion and of feeling disadvantaged. The lack of labour contribution, for example, is punished by withdrawing the entitlement to seedlings; however, female-headed households claim that they have little labour left to contribute but a high need for those seedlings. Similar observations have also been made by van Uffelen (2013:27) who reports that ‘Productive safety net programs such as Ethiopia’s PSNP carry an inherent risk to discriminate against needy but labour-short households.’. This particularly concerns female-headed

households (van Uffelen 2013).

These meetings may also be used to question hierarchies created by the project, and the occasional presence of a scientist is used to claim promises that were negotiated previously. The scientists, however, need to find a balance between supporting those that feel rightfully disadvantaged and those providing a continuous entry point to the community. The counterparts interacting with scientists coming to Galessa Koftu have been nominated by the community, and have entered an informal agreement with the scientists. They pass on information and invitations for training and organise meetings and community activities related to the research centre's agenda in Galessa Koftu. This approach seems to be common in other areas of Ethiopia as well: for example, Segers, Dessein, Hagberg, Develtere, Haile and Deckers (2009: 106) report that farmer representatives are often pointed out as mobilisers and models in the government's rural development interventions. Moreover, they also become important entry points for the scientists, and information is channelled through them, and this privileged knowledge equips them with power.

However, there is no agreement on how ways of knowing can be shared with others, such as those outside the watershed: at the Nursery Group meetings the allocation of work and the resulting benefits were a heated point of discussion. Different actors gave different responses on the issue of benefit sharing. While an extensionist objected to the distribution of improved seeds and tree seedlings to other villages outside the watershed, the farmers found it difficult to refuse to share these with their relatives and friends outside the watershed area.

> The seeds ought to be distributed only in the watershed farmers, but I have noticed that there are farmers who did not get seeds in the watershed and I heard that some farmers got the seeds who were out of the watershed. […] Farmers living in the watershed got access to seedlings from different varieties of trees, but farmers living outside of the watershed only get access of seedlings of eucalyptus. (DA, Galessa, interview, 11.5.2010)

> There is a social problem on me, because I am working for that project […]. This community [outside the watershed] always asks me why this project is not covering our village. And therefore I ask even to Holeta Research Centre and the Kebele, but the answer that I got from the Centre is that there is a project; there are objectives of this watershed management and the area coverage. […] I told them [the community] that this also is not covered outside of the watershed management, but the people are still, they are just bartering. By bartering improved seeds in exchange for the local seeds they can get it. (Farmer, 42 years, Gebeyi, interview, 9.5.2010)

During the interviews the HARC scientists seemed comfortable with the fact that people outside the watershed benefited from the new seeds and tree seedlings from the project, for

example, through bartering. Yet, it is clear that the watershed remains an important demarcation, because the watershed as a concept is the basis of the whole approach (see 3.2), and it is an important model site. Therefore priority must be given to the community members within this boundary.

During the Nursery Group meetings I observed the central point of negotiation becoming very tangible. Who has a right to benefit from the knowledges of the FRGs working with HARC, and who has to be excluded? In a society with a tightly knit network of relations that extend across landscapes and bio-physical boundaries, this is a very difficult question to answer. The group meetings are a formal yet informal attempt at dealing with such issues. The community decides who participates, and how decisions are made – yet the actors in charge of the choreography have been assigned to this task by the scientists, and the agenda is partly determined or at least influenced by them, and the participants may feel their presence and interest in what they are doing even if the scientist are absent.

5.4 PACKAGING SCIENCE

This section takes a closer look at the representation of the GWP in the workshop of a follow-up project. This serves to illustrate how the scientists working for the GWP represented their findings to a mixed audience of farmers, scientists, policy-makers and NGO representatives.

In the workshop there were farmers present, both male and female. But still the scientists were representing the farmers, as they were representing the soil and the trees. The farmers only got a chance to talk briefly after the numerous PPPs of the scientists from Ethiopia, Uganda, Tanzania and Kenya, and they formed their own group during the group discussions. Yet, already in the opening speech an AHI representative had said that AHI focused on scaling out already known practices to the farmers to get ‘for once the community out of the passenger seat and become drivers of their own destiny’ (AHI scientist, conference opening speech, 20.10.2009). However, during the conference I got the impression that ‘the community’ stayed in the back seat, if not actually forgotten in the pickup truck’s cargo area. As explained in 5.3.1, this was reinforced by the organisers’ choice of venue and setting as well as the choice of language. In fact the latter not only excluded the farmers but also the non-Ethiopian scientists, as most presentations were in Amharic. It must have been strange for them to talk to an audience that partly did not understand anything:

> NN [AHI scientist] follows up with her presentation. She seems insecure in her presentation, and turns away from the audience most of the time, with her back towards the side where the farmers are sitting. She asks NN [the Ethiopian workshop facilitator] if he will translate her presentation for the farmers. He just asks her to continue. This must be very strange when you talk to an audience where one quarter of the people do not understand you, and there is no translation provided. (Workshop observation notes, 20.10.2009)

This presentation also revealed to me that there was a gap between the understanding of the project by AHI and their Ethiopian partners. Repeatedly she emphasised what an important role the farmers had to play, and that 'even farmers, they are experimenting. I think it will be coming out in the presentations that farmers are actually researchers' (AHI scientist, workshop presentation, 20.10.2009). But she did not, however, include the farmers on a slide where the researchers were listed. One of her colleagues in his presentation equally emphasised that there should be 'people-centred co-management' and 'people should not wait for their government to act but take initiative themselves' (AHI scientist, workshop presentation, 20.10.2009). Before that he showed an eroded landscape in Uganda followed by a 'well managed landscape', emphasising that 'we want all landscapes to look like this' (AHI scientist, workshop presentation, 20.10.2009).

In this first part of the workshop the AHI scientists made it clear that they wanted an active role for the farmers – but they did not follow up this principle in their own presentations. They also made a claim as to what the landscape 'we' all wanted should look like. This representation of destructive land-use practices versus a vision of intact landscapes also came up in the following PPPs. Problems listed included population density leading to land shortage, deforestation, overgrazing, free grazing regimes, soil erosion and declining soil fertility. Drastic images were shown of gully formation on farmlands, land 'becoming out of production' and rivers that carry away the soil from the land. Technical solutions were presented in detail, followed by impressive before and after representations.

Another scientist in his PPP about the role of forests in watershed management showed the image of a massive, denuded mountain seemingly bare of vegetation cover. His accompanying remark was 'Loss of forest means loss of everything' (E-Scientist, workshop presentation, 20.10.2009). He then showed different tables with changes in soil nutrient contents under different tree species and different soil types. As an example he mentioned Galessa:

> Problems encountered were that most farmers did not actively participate, leading to poor handling of the nursery, and the partnership question by the owners of the nursery sites.

> […] Now farmers get access to seedlings, and they are able to establish and manage their own nursery, and it increases the prevalence of trees around homesteads.[…] The dynamics in the communities need to be taken into account, and approaches need to be revisited. Also the diversification of species needs more specific attention, and technologies and training on how to use different species to generate income are required. He ends by showing pictures of a 'well-managed watershed'. He emphasizes very much that farmers motivation is based on economic incentives, and the failure to adapt due to lack of skills and knowledge. (Workshop observation notes, 20.10.2009)

There was a gap between what the scientists wanted, and what the farmers wanted, and that this was a big challenge for the project. Similar PPPs followed, and there were many tables and figures about natural resource degradation, more dramatic pictures of soil erosion, effects of uncontrolled grazing etc. and technical solutions to counteract those challenges. Few comments were made on the role of the farmers. One referred to indigenous knowledge and practices as an opportunity. Another scientist referred to the need to show economic benefits to farmers when introducing new technologies, but also remarked on the perceived lack of awareness and knowledge of farmers about the 'negative impact' of their farming practices:

> 'Farmers' exposure to the available and recommended technological options via different ways like training and cross-visits also helps as an important decision tool for action. The community have started to realize that keeping few productive animals is beneficiary.' He emphasizes […] how this technology can transform their lives, income generation […) And he says, that 'few farmers are aware that poor livestock management systems can have negative impact on integrated natural resource management'. In his recommendations he emphasizes that raising awareness of the community through exposure to the available technological options, training and cross-visits is important. (Workshop observation notes, 20.10.2009)

Most PPPs of the Ethiopian scientists first represented the trees and the soils, and showed how deforestation and soil degradation had reached a dramatic scale. They used drastic images of landscape degradation, provided 'fact-based' solutions by showing tables and graphs full of numbers, and then pointed out that the farmers were making some progress in implementation, but due to 'lack of awareness' or even 'lack of knowledge' they were still 'destroying the environment'.

The workshop organiser had already told me before the workshop that there were misunderstandings between the local organisers (EIAR and HARC) and AHI. The expectations for the workshop itself were different: on the one hand, the (non-present) donor (IDRC) had to be satisfied not just with an impressive project inception, but with a participatory process empowering farmers at the forefront. On the other hand, the Ethiopian scientists were keen to present their research findings and experiences. Some of the Ethiopian scientists were also

critical of the workshop, especially the language confusion:

> What I feel is, if you see identification of technologies, there were so many things mentioned, that because of time limit we didn't really reflect on everything. I said, we do have this technology, but we don't really, we have no any time to discuss that was the problem we face. And it depends, I feel that project, the workshop should be divided into two. A scientific forum, like what are really technologies we have at hand, and then how we can introduce, that should be presented by Amharic or Oromiffa. You can discuss separately with them, and then with scientists as well. So people from Uganda and Tansania, if you remember they were not following the workshop, if you remember, some people were out […] because the presentation was in Amharic. Only a few words in the slide. In any case it is good to start. (E-Scientists, interview, 29.10.2009)

The workshop had to be both a stakeholder meeting *and* a scientific conference at the same time. Apart from the farmers, there were also other non-scientific stakeholders such as *woreda* representatives and NGOs, some of them also giving presentations. However, already on the evening of the first day it was clear that it was not possible to bring the two concepts together satisfactorily. A meeting was held where AHI and some HARC scientists were sitting together. The challenge of the language mix was recognised and the lack of interaction with the audience. A longer point of debate was the missing involvement of farmers. The farmers were sitting together on one side, and appeared to be 'put aside'. The group discussed that there was no presentation by the farmers about their knowledge and their inputs to the project. The second day of the workshop was planned more interactively, and should have provided better opportunities for the farmers to participate. The basis for the group discussions, however, were the interventions suggested by the PPPs on day 1. The groups were oriented according to the participants' professions. This was purposely decided to enable especially the farmers a more free debate without influence from outsiders.

The presentations of the group work revealed that the farmers invited to the workshop were model farmers who had received an award for their work last year. It was the project coordinator of the GWP who made the presentation on behalf of the farmers in Amharic. Only some of the farmers were actually from Galessa; the others were from the new AHI project sites. Finally, the conclusion of these group presentations remained unclear. The presentations listed interventions and how they were rated by the different groups. For the implementation of interventions the new project wanted to use multi-stakeholder platforms, and the remaining time of the workshop was used to make a list of stakeholders to be included in those.

It was difficult to assess what the farmers were making of this. When asked about the

workshop they said they appreciated it. Critical voices about the GWP and its activities were hardly heard during interviews and FGDs – this is also understandable as my translator was a member of the project and a HARC staff member. For farmers, interactions with projects can be challenging. The incentives to participate in a workshop like the above are often primarily financial. One female farmer said during the interviews that the GWP had made them dependent in paying for participation in training and the like, and that they were expecting more of this. While the need for financial support is understandable, this is hardly the objective of the GWP. I asked GR what was the impact on the lives of the farmers in his opinion:

> I think we need to work more. There is change, you can see the change, but still, you know as a researcher sometimes it is not easy to cover large areas in terms of manpower, facility, resources. […] we have learned a lot also. We have learned. And you know, the methodologies, that we are developing, or that we have developed before, can help for other practitioners. Now I am called everywhere to give training, a seminar, or to present in the workshop, in our experiences. So this is really very interesting. So this can help for the others. […] we have also developed manuals for the Ministry of Agriculture on how the Kebelle handle the watershed. […] Sometimes the policy-makers are also at local level or at district or zonal level. They participate in our workshop or read, so they can gather all this information, but mostly they read evidence. If you have clear evidence, I think you can publish it. (GR, interview, 9.2.2010)

GR here also mentioned a key message he had pointed out to me on repeated occasions: if you want to convince policy-makers, you must show them numbers and facts as evidence. This is certainly in contradiction to the farmers' ways of knowing, which were much more grounded in visual experiences, as well as emotional and intuitive ways of knowing. The workshop, however, was clearly oriented according to rational ways of knowing, focusing on logic, numbers and 'facts'. Thus the scientists packaged and represented on the one hand what they had learned from the GWP, and on the other hand, what they could offer to the new AHI project.

This debate left little room for the farmers who were not only without genuine representation, but beyond that were also represented in unfavourable ways as being unaware of the consequences of their practices on the environment; lacking adequate knowledge; or harbouring merely 'indigenous' or 'traditional' knowledge, which even though inferior to scientific knowledge should still be accessed as a complementary sources of information. The farmers may not have heard those words being said about them, as the presentations were in English or Amharic. However, the workshop certainly did not treat them as drivers of their own destiny as promised at the outset.

5.5 CONCLUSION

In the examples in this chapter the choice of setting and place, the modes of representation such as who talks, in which language, and by the use of which technology, are influenced by the relations between the different actors as well as their respective social worlds. Depending on this, the extent of (mis)understanding each other varies, as do the ways in which power comes into play in a positive or negative way. It was clear from the beginning that the perceptions of farmers and scientists of problems and solutions, as well as knowledge and technologies, would be substantially different in both case studies. The gap in social worlds of farmers and scientists is there; even though many Ethiopian scientists grew up in farming environments themselves, this seems like a memory from a distant past, and has little impact on their perceptions of the social world of farmers.

The scientists distance themselves from the social world of the farmers in using certain terminologies, symbols and metaphors that equip them with authority. Examples are the choice of venue for the workshop in Addis Ababa, the use of PowerPoint, the choice of language, the use of English terms even in Amharic, the short and orchestrated nature of their visit to the villages. The foreign visitors and the project manager arrived in a white pick-up car, while the farmers who participated in the workshop and the less senior scientists travelled in a bus. The scientists visiting the villages on the field day brought video cameras and digital cameras, recorded and took photographs without asking permission. These are just some examples of symbols that served to create distance between the farmers and the scientists. There was a boundary between the scientists and the farmers during the workshop – it was visible in the seating arrangements during the workshop, where farmers and scientists sat in different parts of the room. It manifested itself in the fact that most scientists I asked did not talk to farmers during the workshop. And it was also visible during the field day, where most scientists again talked to other scientists rather than using the opportunity to talk to the farmers, as I could observe myself during this day. The role of the farmers in the field day was framed as ‘experts’ during the workshop in Addis Ababa, however the experts were not consulted much by the visitors.

For farmers and scientists it can be challenging to find places, languages and suitable packages to talk about technologies in a satisfying way for both groups. The standardised packages (Fujimura 1992) used by scientists repeat common arguments about the farmers’ assumed role in environmental destruction, and the scientists role in making them aware of their mistakes.

The standardised representations of soil erosion, deforestation and degradation leave no space for other, alternative versions. Technologies are packaged in standardised ways emphasising their authority. This may also affect the farmers' responses to their presence and activities that reach deeply into their social worlds. So-called participatory methods should help scientists to overcome such barriers and gain the trust of the farmers. Yet, such negotiations were limited in both case studies.

Similar to the techno-political cultures of Felt *et al.* (2009: 4) social worlds remain distinct and influence the way the world around them is seen and how ways of knowing are framed. The farmers seemed very comfortable giving a presentation in the middle of a field or standing next to a cow. During the field day they appeared proud and confident, and talked at length about their experiences and their knowledges regarding the technologies introduced by the GWP. They reported on how they had used the technologies in their own ways, and how they had used their own ways of knowing to fit the technologies into their farming systems. Even though many farmers were not able to benefit from the project in that way (see 3.2.7), the farmers selected for these presentations were among those who could make use of the technologies and improve their productivity in doing so. They were in their own environment, and they represented their achievements with confidence. However, removed from this context they appeared subdued, powerless and marginalised. This was reinforced by the fact that the number of farmers invited to the workshop was only one fourth of the workshop participants. The majority of the participants were scientists. Among the scientists who made presentations, most felt very comfortable using a PPP, presenting photographs, graphs and tables, as well as bullet-point lists. Using PPP during conferences and workshops has almost become a ritual (Denskus 2014). The setting of the AHI workshop in Addis Ababa resembled any kind of similar international workshop or conference, with chairs for the audience, an elevated table for the panel speakers and a laptop plus LCD projector for giving a Power Point presentation. The men – and the majority of the presenters were men, except for the AHI coordinator – wore suits and ties, and I perceived them all as very professional and academic in their appearance. As in Denskus (2014), the setting and the appearance replicates what is expected in similar events all over the World. Even the fact that the Ethiopian scientists knew that a lot of people in the conference room did not understand what they were saying in Amharic did not change anything about the setting, except for the fact that the slides were in English while they were speaking Amharic. In spite of this language confusion the presenters nevertheless continued talking to their own (Ethiopian) peers, most of them colleagues from their own institutions. In the field however the ritual changed, and the presentation

technology (and the language) of the farmers dominated – and I observed that many scientists seemed lost and even stopped listening.

The project organiser told me that one of his main intentions of organising the workshop and the field day was to enable interaction between the farmers and the scientists. However, this worked only to a limited extent. The two remained distinct groups throughout the workshop setting, and their affiliation to different social worlds was reinforced through the use of language and presentation technologies. Open and hidden transcripts as suggested by Scott (1990) are characterised by power imbalances; the different stories told in different circumstances shaped by interests of different actors. This is also expressed in the scientists' preference for quantification, and the farmers' preference for visual and experiential confirmation.

When different actors come together to meet and discuss a project and its activities, they also negotiate about the different ways of knowing that meet in this project. However, in this case the more powerful actors were the HARC scientists who dominated the event in number and in influencing how the event was orchestrated. The farmers in Galessa had very little chance to express their own ways of knowing in a way that was also accessible to the scientists. The events observed showed the complexities in the relationship between the scientists and the farmers in this respect. There were numerous expectations, but also many limitations. And it was hard for the scientists to acknowledge farmers' knowledges as equal ways of knowing. The temptation to classify their knowledges as practical and interesting, but still not equal, is strong and resides deeply in the training of a scientist. It is embedded in how a scientist defines him/herself. It is difficult to overcome such barriers created by training and enforced by societal and institutional hierarchies.

6 SYNTHESIS AND CONCLUSION

This final chapter summarises my main findings and discusses them in relation to the conceptual framework. I start by looking at the overall aims of the study. Then I provide a synthesis of the key findings and issues emerging from all of the empirical chapters. I discuss how certain narratives and visions of the Ethiopian Highlands were retold and reasserted in the case studies, which scripts the projects developed and how they were related with those narratives as well as farmers' ways of knowing. I also discuss the implications of the enrolment of farmers as actors in the project, and what role the specific interpretation of 'participation' in the case studies and the wider Ethiopian context played in this. This then leads me to debate how power and exclusion have been represented in the case studies, and what implications this had on farmers' and scientists' ways of knowing. In the concluding sections I then discuss these findings in relation to the broader academic debates as well as practical and policy implications in Ethiopia. Finally the chapter will highlight which contributions to the literature I make with this thesis, and it also points out gaps in the analysis, a reflection on positionality and future research directions.

6.1 REVISITING THE OVERALL AIMS OF THE STUDY

In this study I sought to understand the interaction of farmers' and scientists' ways of knowing. Specifically, I tried to analyse the importance of social worlds and the role of ways of knowing and emergent knowledges when farmers and scientists meet. Finally, I wanted to critically examine how relations, places and representations influenced how the successes and failures of such projects were communicated. The research therefore asked what epistemologies and narratives existed among farmers and scientists in tree and soil management, and what social worlds and perspectives shaped the nature of farmers' and scientists' understanding of trees and soils in the Ethiopian Highlands. It also asked what interfaces emerged between those actors and what role 'standardised packages' would play in the representations of farmers' and scientists' knowledges.

Language and authority, spirituality, emotions and memories are not necessarily ways of acquiring knowledge that scientists would subscribe to – in contrast to observation, reason and logic. However, when looking at them in detail one finds a surprising extent of intersection. Farmers may have a stronger belief in their senses, and may be more influenced by emotions, spirituality and intuition than scientists, but they also follow logical ways of knowing. Social worlds of scientists and farmers are different, but sometimes they also meet

and intersect when joint interests emerge at their interfaces. Thus considering the influences of different social worlds as well as alternative ways of knowing would certainly benefit research projects, especially in terms of adoption of technologies and long-term sustainability. The use of authority and exclusion in the context of knowledge has been problematic in the case studies as well: the local dynamics of power and exclusion from access to resources and knowledge have not received much attention by the scientists.

However, the structures of the Ethiopian research system and donor requirements, in this case the Austrian donor organisation KEF, left little space for in-depth engagement with social issues in the case studies. The scientists had limited time and resources to engage with farmers and their ways of knowing or to understand the complexities of their social worlds and their environment. This prevented the development of interactional expertise (Collins and Evans 2007) that could have enabled a much more fruitful cooperation between scientists and farmers. While the two case studies were certainly not failed projects, they both had their challenges especially in terms of stakeholder representation, the role of spokespersons and elite farmers, exclusion and abuse of authority, and difficulties regarding sustainability after project end.

This was also reflected in the scientists' representations of the trees, the soil and the farmers to the outside world. In the case of the GWP the workshop partly discussed in chapter 4 and in more detail in chapter 5 demonstrated how the trees, the soil and farmers were transformed into illustrative photographs, tables and other figures representing evidence that underlined the scientists' arguments. The farmers played a passive role in its representation; they were part of the audience. Their 'indigenous, local knowledge' was praised as complementary to scientific knowledge, but at the same event scientists emphasised the farmers' presumed lack of awareness for the consequences of environmental degradation.

There are some farmers who share – at least in some contexts - official narratives that frame farmers as the main culprits in environmental degradation. These narratives discussed in chapter 1 and revisited throughout the thesis exaggerate the existing problems of deforestation and soil erosion into dramatic scenarios of disaster and catastrophe where entire landscapes turn into unproductive and uninhabitable deserts (chapter 3). This scenario was shared by only a few farmers who tended not to project such dramatic consequences of continuing ancient farming practices.

6.2 SYNTHESIS

6.2.1 SCRIPTS AND NARRATIVES

In the introduction to this thesis I wrote about the history and politics of land use in Ethiopia. I explained how historical developments have been interpreted in different ways, and how different narratives have emerged from those interpretations. Chapters 3 and 5 then provided further insights into how those narratives, different visions and reality collide when it comes to imaginations of environmental degradation in the Ethiopian Highlands.

In chapter 3 I described the case studies in detail, as well as their scripts and narratives. The project proposals promised the improvement of agricultural productivity, the farmers' income situation, sustainable development, and food security. One prominent justification for the research done in Galessa was that the price of fertiliser was high. By applying the scientists' recommendations the farmers would reduce the expenses for fertiliser substantially because more soil fertility could be achieved with certain soil improving trees and shrubs. The project's (CST1) narrative deplores demographic pressure on small landholdings, the improper land use system, nutrient depletion; it claims that deforestation, the need for fuel wood, construction wood, overgrazing, and land conversion for agriculture make soil erosion and land degradation worse than ever.

In Ambober (CST2) the project's script anticipates an impact on food security through improved agricultural productivity and improvements in conservation of biodiversity as well as natural resources. The narrative of the project talks of rapid deforestation in Ethiopia, and anticipates a grim future for Ethiopia's remaining forests. Deforestation is linked with decrease in soil fertility. Similar as CST1 the narrative links the decline in agricultural production with the farmers' inability to buy inorganic fertilisers to replenish the depleted soils. The establishment of exclosures is justified with the need to fight land degradation. In the beginning AR was concerned how to exclude people from the area – later on he developed real concern for the role of the users themselves, and how they would be affected by exclusion. In Ambober one problematic issue was the *definition* of users – their role was a passive one from the outset, their potential to participate actively was very limited. In theory, the users were farmers living in the area of the exclosure, who had a stake in the land and were potential beneficiaries of the revenues. In reality and due to the villages' internal power dynamics it seemed that the users were a few model farmers, the guard and his family, the development agents, and few other farmers. At the outset AR had planned that the farmers would become labourers for the

project. It was later on that he developed a different relation and insight into the knowledges of farmers.

In Galessa (CST1) the definition of users also created some conflicts. The delineation of the watershed as a boundary and the limitation of users to those farmers living inside the watershed were in contrast with the people's lived experiences of social and agrarian networks. But there was some objection to disseminate for example seeds given from HARC to people outside of the watershed (5.3.3). When some farmers gave improved seed varieties to their relatives outside of the watershed, the DA disapproved. I asked GR about this, and he himself did not have a problem with this. After all, the GWP was interested in up-scaling and disseminating the lessons learned and the technologies developed on a wider scale. Nevertheless, there was no agreement on this among the people inside the watershed.

Some farmers adopted the scientists' narratives, especially model farmers and other farmers cooperating more closely with the projects, such as the network around the local contact farmer in Galessa, repeated similar stories about land degradation, deforestation and the role of farmers in these processes. One other example was the priest and guard of the exclosure in Ambober (4.3): before I could even start the interview, he already listed all the advantages of the exclosure, but he did not mention any of the ecological and social challenges. At least in the interaction with outsiders they showed a similar lack of consideration for the wider context of farmers' social lives and histories as some scientists did. While the projects' narratives elaborate on land degradation and the farmers' role in it, they ignore the specific history of the site and the people living there. The narratives do not speak of any linkages between the management of trees and soil and local customs, as well as the role of different ways of knowing such as spirituality and memories. In both cases the projects' script leaves little space for social issues and social research. The framing of users is quite rigid; it leaves little space for difference, diversity and heterogeneity. The users implement the prescribed technologies – their role in selecting them is limited.

The projects certainly helped the two main scientists to gain a better insight into the lives of the farmers, and the way they were managing their land. Their understanding and interest for farmers' needs increased much during the project - this can also be seen in comparing the proposals and the reports. The challenges they were facing were not rooted in their attitudes – blaming them personally as scapegoats of ignorance regarding social issues would be wrong and unfair. The narratives they laid out in their proposals are deeply institutionalised and are

repeated in manifold versions in policy papers (1.4.4.3). And they were reinforced by the technologies used: the approaches selected, Integrated Watershed Management and Exclosure Management, fit well into the policy framework laid out in chapter 1. The technologies dominate; the user plays a minor role: the technologies were not developed with active participation of the farmers, the farmers must adapt to the technology (Oudshoorn and Pinch 2003). But the technologies introduced to farmers to increase productivity and to protect the soil from erosion are often inadequate for their needs and the agro-climatic prerequisites on a local level. Farmers in Ambober also reported this for technologies provided by the extension officers: they told about seeds that did not grow in their areas, tree seedlings that were not performing, ploughing technologies that did not work on their land. BBM is a ploughing technique specifically for wheat production; at the time of my research it was heavily promoted by the government, but several farmers in Ambober complained that it was not suitable for their land. The most abundant tree seedling in the multiplication centre of the government in Wuzaba in the vicinity of Ambober is eucalyptus. Eucalyptus is covering many needs for timber and wood – but it does not thrive everywhere. Ambober has many termite-infested areas where eucalyptus does not grow, but there is no alternative tree providing similar services and fulfilling the needs of farmers. Other farmers complained that the way the technologies were introduced to them was not helpful for them – they would have preferred much more on-farm demonstration and frequent follow-up visits by extension officers in order to learn for example how to grow new seed varieties. But in FGDs many scientists complained about 'dis-adoption', the perceived unwillingness of farmers to implement new technologies, rather than engaging in a critical analysis of the adequacy of the technologies and the way they had been introduced to farmers.

In chapter 1 I discuss the narratives about deforestation in Ethiopia that often puts the blame on farmers as the main culprits. In Ambober many farmers would like to have more trees because they see benefits for example in terms of shading and soil protection and they expect increased rainfall from an increase in tree cover. In Galessa many people had started to plant trees in their homesteads. Until recent times Galessa was surrounded by forest areas and did not know shortages of wood, but nowadays the scattered trees on farms have also been removed and the forest areas have almost been eradicated. The settlement history of Tiru in Galessa, like Woglo in Ambober, starts in the 1950s/60s. This is a relative short time period that has seen a lot of periodic insecurities. Farmers reported that during transition times (from imperial to Derg, from Derg to EPRDF) most trees were cut. Deforestation is thus linked with political processes, oppression and historical developments (1.4.3.4, 4.2.2.2) rather than

ignorance or 'lack of awareness' among farmers as a presumed homogenous group. The impact of those factors varies at a local level, depending on the severity of actions of those in power during times of oppression.

An example of divergent views of farmers and scientists is the choice of tree species (4.3). Farmers in the case studies valued some indigenous tree species, but not all, and they clearly prioritised eucalyptus. The position of the scientists in the case study was ambiguous – during informal encounters and sometimes during interviews some of them would support the farmers' priorities, and emphasise the importance of eucalyptus for the people in Ethiopia. However, when I listened to the same people during official statements in workshops that I attended in Ethiopia, they would usually be careful when it came to overtly promoting eucalyptus. Rather they would emphasise the negative effect eucalyptus has on its environment according to literature. The reason for this is most likely the disagreement in literature regarding eucalyptus. Few people situate themselves clearly for one or the other position. Some scientists suggest that eucalyptus serves as a viable and inevitable source of wood for fuel, construction and timber if appropriately managed (e.g. Pohjonen and Pukkala 1990; Hailu 2002), but others insist that eucalyptus is environmentally harmful and that more focus on indigenous species would be advisable for sustainable land management (e.g. Legesse 1992; Embaye 2000). In spite of a lively debate around the performance and impact of eucalyptus in Ethiopia some scientists still consider eucalyptus a destructive tree that drains all available water from the soil and that does not allow any undergrowth due to its allopathic effects. While this may hold true in some parts of the world, in Ethiopia eucalyptus is performing surprisingly well, and the allopathic effect is hardly noticeable. There is even evidence that some rare indigenous species such as *Podocarpus falcatus* and *Juniperus procera* are regenerating well under the canopy of eucalyptus (Pohjonen and Pukkala 1990). But the phenomenon of different framings of trees and perhaps also of soil by different interest groups in different ways is known from other parts of the world as well. Robbins (2004) mentions several examples of where trees and forests were framed in completely different ways by foresters and local people: *Prosopis juliflora*, introduced to India from Mexico a century ago, is seen as a blessing by foresters, who value the tree for its impact on forest productivity and the increase in forest area due to *Prosopis* plantations. Local herdsmen, on the other hand, describe the tree as 'a hazard and a blemish' (Robbins 2004: 108).

Some farmers are genuinely concerned that their land will become infertile and that floods will wash away the 'remaining soil' and leave them with nothing. Others are optimistic and believe

that their land is good and that with hard work they will survive and make a good living. In Ambober more areas have been dedicated to exclosures in addition to the case studied in this thesis. This shows their wish to increase forest areas with benefits for the community as well as their belief in their capability to produce enough food on the remaining lands. Exclosure areas are also established on land that is no longer used or has never been used for crop production, mostly because the land is too steep for ploughing. In Galessa the farmers are optimistic that they can continue growing potato and other crops that have provided them with good and relatively stable incomes. If this status is to be maintained also depends on the support they will receive from the Holeta Agricultural Research Centre (HARC) (see 1.4.5 and chapter 3, 5) and the extensionists in terms of seed quality and combating potential disease outbreaks.

Alternative representations as suggested by farmers in this research should support a new way of thinking about natural resource use in the Ethiopian Highlands. As already shown by of Leach and Mearns (1996) for West Africa, as well as Hoben (1995), McCann (1995), Nyssen et al. (1994), Eshetu and Högberg (2000a) and others for Ethiopia, a more comprehensive understanding, taking into account local representations and local land-use histories, political and historical developments and farmers' visions, is required. Considering this and a more differentiated approach to alternative ways of knowing as described in Chapter 4 would certainly support a joint vision of farmers and scientists for sustainable development in the Ethiopian Highlands that lives without simplified representations and myths of mutual blame.

6.2.2 ENROLMENT AND PARTICIPATION

I discussed the understanding of participation in relation to land use in 1.4.3.4, and more generally in 2.1.3. Harrison (2002) has explained how 'participation' has become an essential component of rural development in Ethiopia through the increasing role of civil society organisations since the 1970ies. However, she also emphasises the context of the Ethiopian State that is 'hierarchical and controlling' (Harrison 2002:598). Experiences of coercion and control, as well as the interpretation of participation as 'mass mobilization', have influenced the perception of participation by farmers and scientists in the case studies.

Integrated Watershed Management brought a new understanding of participation to the GWP from outside Ethiopia. This understanding was fostered by scientists working for AHI assigned to the INRM project in Galessa. Through this new approach (Participatory Integrated Watershed Management) the project offered some scope for participation for farmers that

moved beyond merely informing and consulting them. The farmers were able to contribute a list of priority issues, and they were involved in the decision which technologies would be applied. The approach applied in Galessa regarding priority selection was participatory, but in an ambiguous way: the farmers were encouraged to rank their main problems that they wanted to be addressed by the project, but as it turned out that the list was long and that there was some overlap in some of the issues, the scientists took the next step in their hands and returned to the farmers with a 'shortlist' (3.2.6). Thus the scope of this sharing of decision-making was limited, and the scientists took some decisions back into their hands. However, given the context and previous experiences in Ethiopia, this was a big step towards the farmers in terms of decision-making. The focus on biophysical issues in the GWP was softened by this but not fundamentally changed. In the research of GR the users were enrolled in his research to provide information. He then used this information as a basis for this bio-physical research experiments. It is however not clear who the people were he was talking to, whom they represented and whose interests – and if this mattered to him. Perhaps it is not so important in this context that the final decisions were taken by the scientists. What matters more is how they got to this stage.

Unfortunately ownership of the GWP is not high as the examples of the decaying training centre, the neglected community nursery and the theft of equipment have shown (3.2.6). But did the scientists really have a 'right' to withdraw after such a long time? If potato diseases destroy the success of the seed potato it is likely that extreme poverty will return to Galessa. The farmers expect the scientists to continue what they started. During the project the scientists continuously 'brought' things to Galessa: new seed varieties for cropping, cross-bred dairy cows, and seeds for different tree species, training and advice. The farmers believe that they have entered a commitment by doing so. The scientists on the other hand are disappointed that only few farmers adopted the technologies that they brought. The spreading of the technology throughout the watershed only worked in case of the seed potatoes, and to some extent also for tree planting in the homesteads. But SWC has not been applied as widely as it was hoped for. This lack of adoption is blamed on the farmers. One scientist suggested that the farmers could not handle the work load (3.2.7). But the fact that for example private nurseries fared much better than the project nursery speaks clearly against that. A more differentiated analysis for this presumed 'lack of adoption' or 'unwillingness' of farmers to implement prescribed technologies would provide a broader picture of the real reasons behind the farmers' presumed 'opposition'. One example for this can be seen when looking at the meaning of IWM to farmers. Even though the concept of IWM is very popular among scientists

in Ethiopia (and elsewhere) due to its bio-physical appeal, it remains a constructed concept. The bio-physical construct 'watershed' has not much to do with farmers' realities. Some farmers living inside the watershed own property outside, and some farmers owning property inside the watershed live far away. This also affects their motivation to apply technologies that require permanent changes, for example planting trees or applying soil and water conservation measures.

A template or blueprint approach like IWM or EM does not leave much space for diversity of users – and such approaches are often used for 'upscaling': this means to apply experiences made in one watershed in another, perhaps even larger area. However, as the experiences in the GWP have shown, even working in a small watershed like Galessa requires a lot of knowledge on contextual issues to make IWM work. Not knowing kinship relations, social boundaries, and also the resilience of a community can be risky. If people invest a lot in one technology, but have nothing to fall back on, the failure of this technology can be fatal. Therefore IWM and other approaches should take such matters into account.

In both case studies 'cases' were identified by the scientists. They discussed with farmers about 'their problems' and then suggested solutions. However, the solutions were already prepared at the time when they had those discussions: in CST1 it was Integrated Watershed Management and in CST2 it was Exclosure Management. These approaches were no longer negotiable as their application was the fundamental reason for the work of the two main scientists, GR and AR, who had decided to write their doctoral thesis about topics within those approaches. The negotiation with farmers at that moment was already dealing with a very limited amount of negotiable items: the package was already prepared. As AR observed after the first phase of his project, it needed much more involvement of people with diverse attitudes towards the exclosure to reach a compromise that would enable a long-term protection of the exclosure.

In CST2 the farmers were informed about the exclosure during a meeting. In this village meeting they could support or oppose it – except for one area already designated by the government. The latter was a sore point with some farmers, who were negatively affected by that. As AR realised soon, different farmers stood in very different relations to the exclosure, depending on where they lived in relation to the exclosure, how much livestock they had, what attitude they had in general towards exclosures and forests, etc. This was more information and consultation rather than sharing decision-making, but like in Galessa even this type of

engagement was perceived positively, as it was still uncommon in Ethiopia. Another type of enrolment was more familiar to farmers: the exclosure project enrolled farmers as labourers, guards and committee members. The latter was necessary to regulate use and the income from the exclosure, and to interfere if somebody violated the rules ('bylaws') developed to protect the exclosure.

From the viewpoint of AR's supervisor, CST1 originally was designed to go further in terms of participation, and to involve users in decision-making regarding location and size of the exclosure. But AR had to work with the interests of many stakeholders to come to this point: the church, the *kebelle* chairman and the DAs, the Woreda agricultural officers, the representatives of the Austrian Development project SRMP-NG - and the interests of his supervisor. Eventually he had to follow a more conventional path of decision-making where those in power decide first and then discuss this with the users. However, the fact that he could not achieve a community-wide consensus for the exclosure also led to problems later on. Part of the reason for these problems later was that his project was appropriated by some people, while others were not consulted. It is not clear who the farmers were in terms of their roles in the community who were closer to the project and AR. There are some people who have good relations with the government authorities, and they are the first ones to establish connections with incoming projects. It was easy for AR to get their support, as they saw the benefits of the exclosure – as long as it remained under their control. AR only later on realised that he needed a broader support for his project, and that there was a diversity of opinions among the people.

When it comes to enrolment and participation the consideration of the context is important – participation must adapt to the society where it takes place. It is not the task of natural scientists in forestry projects to fight for social revolutions and encourage people to live through an experience of deliberation they will not experience in others parts of their lives. More importantly, the scientists as designers of such processes should aim to ensure enough space for alternative views and opinions to accommodate broader sections of the community beyond the usual powerful elites that tend to appropriate such processes and to develop awareness for the identities and social worlds of the people working them.

6.2.3 POWER, KNOWLEDGES AND EXCLUSION

This section will elaborate on the role of power in looking at different ways of knowing and emerging knowledges. In Chapter 3 I addressed the influence of powerful concepts on

scientists' choices of methods and their engagement with farmers. Farmers have been enrolled in different ways to become part of the different scripts laid out by the approaches. I discussed different ways of knowing of farmers in Chapter 4. In Chapter 5 I addressed the influence of place and modes of representation in the case studies, and the role of interpersonal relations.

Social worlds of farmers and scientists overlap: many Ethiopian scientists have a similar background of growing up in rural or semi-rural areas. But this is long gone, and except for a few they do not want to relate to this social world, or they find it difficult to do so. There are many symbols in place that serve to distinguish farmers and scientists such as specific types of clothes, cars, presentation technologies. This was noticeable at the events of the GWP described in chapter 5. The boundaries between farmers and scientists were maintained, ignoring the fact that they had common interests and common pasts. The work of scientists reaches into the social worlds of the farmers, and it also has an impact on them, shifting power and social structures in the villages. Given the floor both farmers and scientists report with pride about their achievements – just the way they do and which technologies and languages they use is different. And while the farmers seem uncomfortable in the scientists' world, the same holds true when the scientists visit the farmers during the field day (chapter 5).

Chapter 4 has shown that the ways of knowing of farmers are influenced by diverse aspects of their lives, past and present. It was striking that many farmers made direct linkage to the past when talking about their knowledges on tree and soil management. They were referring to how they had learned from their parents and grandparents, but they also remembered experiences of oppression under different regimes in Ethiopia and how this affected the way they were managing trees and soil. For example coercive measures in soil and water conservation and protection of forests during the Derg regime led to destruction of such measures and forest areas after the regime fell. Experiences made in the past, positive or negative, influence how people feel nowadays about different aspects of their knowledges. If memories are associated with certain feelings, these feelings will influence whether people will implement what they have learned at that time in the present (Damasio 1994, Dirkx 2008, Taylor 2001). In the case of the farmers in the case studies, some of them have continued applying what they had learned in times of oppression, but they have altered the technologies according to their own needs and thus appropriated the technologies according to their own needs. An example for this are *gesho* terraces described in chapter 4. Others, like the lady I met in Woglo in Ambober, have memories associated with people they cared for, who taught

them about trees and soil, and their value for their lives. These memories influence how she is making decisions about tree and soil management now (4.2.2.2).

Another aspect of people's ways of knowing was also noticeable among farmers at both sites: spirituality (chapter 4). Spirituality transcends the life of farmers. It influences how people come to know certain things about tree and soil management – and what they do not want to know. Farmers often replied that they did not question certain natural phenomena or the output of farming practices, as they put this in the hands of God. And they do not question God's will and knowledge coming from God. Farmers will ask God for support, but they will not question God's intentions. In Oromo, Amhara and Qemant world views trees play a role in their spiritual life. All respect God as a source of ultimate knowledge. God can be asked for help, but the spiritual beings surrounding their different beliefs can also be asked to punish others. These beliefs are sometimes contradictive to the official position of the Church, but silently tolerated by the priests in Wojnie and Woglo. In Galessa the Qallu play an important life in organising spiritual gatherings for social meetings and prayers. However, much of it is kept secret and not shared with outsiders. All these spiritual elements of the world view of the people in Galessa and Ambober were embedded in their lives and work. Most scientists I interviewed would not agree that spirituality could play a role in the acquisition of scientific knowledge. However, the reason was not that spirituality would be contradictive to rational knowledge. Rather the argument was that something coming from God cannot be questioned, and science required questioning. This indicates that these scientists shared a similar strong belief than the farmers, and the conviction that God cannot be questioned. However, they still saw a contradiction between scientific knowledge and spirituality because of their definition of 'scientific', creating something new by experimenting empirically. The claim that ways of knowing can be spiritual, emotional, intuitive, influenced by implicit memories, languages and authority holds true for farmers, but also for scientists. However, few scientists made reference to such ways of knowing during the interviews.

Chapter 5 presents some examples of encounters between farmers and scientists in the GWP and discusses how the choice of place, language and technologies influenced these encounters. It also explains how personal relations between scientists and farmers mattered in the case studies. AR and GR both spent a lot of time at their project sites, and during these field visits and multiple encounters they developed relations with some farmers and the project area as such. The fact that both were writing their doctoral theses about this research enforced the emotional bond they developed with Ambober and Galessa. Their repeated visits,

research and informal encounters influenced how they perceived farmers, their knowledges and practices. Comparing the narratives presented at the outset in the project proposals and the documentation of the project findings in the reports and their theses shows that some of the initially harsh views on land degradation have softened, and their understanding for the diversity of farmers and the complexity of issues influencing their decisions on land management has increased. It was also seen positively by the farmers that AR and GR returned to their research sites repeatedly, and that it was possible to address them informally to talk to them (5.2). Building on such relationships would be a good foundation for a long-term relationship of trust and mutual exchange of knowledge and experiences. These scientists and the farmers who got to know them could have started a fruitful dialogue on their ways of knowing and how to make use of them for improved tree and soil management. Unfortunately the agricultural research system does not foresee this. Neither do international donors: most projects have short project durations of three years only. Once farmers and scientists have gotten to know each other, it is time for the scientists to move on and work elsewhere. The farmers are left behind with the remainders of projects. But it takes so much more time to understand each other's social worlds, build trust, and learn about different ways of knowing. In some communities FRGs will work well, but less so in others – see the example of Galessa. Some villages have higher inequality, and others less, as the comparison of the villages in Ambober and Galessa has shown that were part of my research.

After a lot of contact with scientists during the active stage of the project in Galessa, this interaction decreased at the end of the project, even though HARC still had a mandate to continue research in this area. This was met with frustration by the farmers who had expressed to me during interviews that they expected HARC to continue working with them. As this did not happen to the same extent as they had expected ('continue to provide new technologies to the *whole* watershed') some of them lost their motivation, and the project facilities were not properly maintained any longer. Additionally, handing over the responsibility to two representatives rather than engaging directly with the community lead to several problems already during the duration of the project: the selection of participants for trainings became biased; some households facing labour shortage were excluded from project benefits because they had no labour to contribute to the project; there was disagreement about the distribution of seeds and seedlings outside of the watershed. The local contact farmer had gained a powerful rule, and he and his family benefited disproportionally from the project. While the scientists were aware of this to some extent, he was still an important entry point for them and could not be bypassed any longer. One example where he used his power

to exclude community members was the exclusion of some female-headed households from the project because of their labour shortage. They were not able to contribute sufficient labour to the project, thus they were not entitled to receive seedlings and seeds. In one case this was also related to language and ethnicity – there was only one Amharic farmer in Galessa. I described in chapter 4 how this old woman became excluded from the project. The contact farmer even tried to prevent me from meeting her to hide how he had abused his power.

The workshop of the GWP and the field day have shown how important place is in encounters between farmers and scientists: while farmers appeared lost during the workshop, the same was true for the scientists during the field day in Galessa. I discussed this workshop partly in chapter 4 (on languages) and chapter 5 (about places and communication technologies). The circumstances, the symbols, languages and technologies used influenced how people felt about these encounters. The workshop was in English and Amharic, in the city, and using PowerPoint presentations. Scientists spoke Amharic, but used English slides, and their presentations were interspersed with English vocabulary which they did not translate. In the scientists' social world the use of English as a working language is convenient; however in this encounter their inability to translate this at least into Amharic made it even more difficult for farmers to understand. Languages are also a politically sensitive topic in Ethiopia – many non-Amharic native speakers perceive Amharic as a language of oppression. The current political system fosters the use of other native languages; however Amharic is still the dominant official language.

The field day was conducted mostly in Oromiffa and partly in Amharic and took place in the farmers' villages. The farmers who made presentations stood in the middle of their homestead gardens. The alienation of some scientists by this setting was as striking as the marginalisation of farmers during the workshop in Addis Ababa. This shows that to bring groups of people together that have such different social worlds, experiences and skills requires much more careful planning. It is not enough to bring farmers to the conference room and to take scientists to the farmer's home. This needs more preparation, contextual information for the participants. And it requires the use of different languages, and if not understood by all, then translation must be provided. The technologies used for presentation and group work must make room for *all* participants. Meetings like this workshop and field day are common – often they serve to appease donors and their requirements for stakeholder participation. But their value is questionable. To use the opportunities they provide, first of all they need a more

professional facilitation. Important lessons can be learned from professionals in coaching and mediation. The field of transformational learning (Taylor 2001) contributes novel insights into adult learning that can be very useful for the interaction of different stakeholders. However, events like the workshop discussed above have become ritualised and are hardly questioned even though they consume a lot of resources with little outputs. The workshop ritual in itself takes up too much space – it marginalises the people participating, esp. when they do not fit in the 'norm'. More indigenous presentation methods that move us away from standardised approaches like PowerPoint presentations would be recommended.

Field visits especially need rethinking – but if scientists do not even understand what farmers say, it seems like a waste of time. Only showing off the few farmers who have perfectly implemented a project intervention is not helpful. Farmers seem like objects to look at, as well as their farms, and the work implemented. Instead of producing a showcase, it would be better to provide a setting that makes both scientists and farmers feel comfortable and gives them a chance to communicate.

However, if the project is an international cooperation, sometimes even the different scientists will not agree because of languages and different epistemologies, and understandings of how to work with farmers. Their understandings of farmers' knowledges may differ, and what the core roots of the different problems are that they are discussing. In the case of the cooperation of AHI with HARC there were also different expectations on the workshop. AHI was more concerned with bringing farmers to the forefront, and fulfilling thus promises made to the donor, but HARC was not sure how to implement this, and perceived the language as a particular challenge. The important role of place was overlooked by both of them. Also the Ethiopian scientists were very much interested in representing their scientific findings, while AHI saw this meeting as a stakeholder workshop.

Exclusion in the project affected women in Galessa and Ambober as explained in chapter 4. However, it also affected other people living in the villages: farmers with less financial resources were not able to participate in the social institutions of the villages where powerful decisions were made, like negotiations with the government representatives on land allocation. Many of these poor farmers do not have access to land and struggle to make a living. Being excluded from decision-making hides their voices and needs. These are sometimes the same people who are also accused of illegal charcoal-making and other illegal forest use – even though others admit that the 'rich people' also contribute to deforestation. But it is not

only exclusion from decision-making, and from contributing their needs and demands, it also deprives them from accessing information and knowledges and perhaps other opportunities to improve their lives. Neither can they contribute their own knowledges and experiences to the benefit of their community. However, poverty and exclusion are perceived differently by different people in the villages. For example, in chapter 4 I described how one 'tankara gebere', a rich farmer, informed me that nowadays there was no need for people to be poor. He explained that the projects coming to their village like the Austrian project SRMP-NG offered opportunities for people to become wealthier. However, he overlooked that to access these opportunities a certain amount of assets – and status in the community – was required. In addition, the contacts to the DAs remain primarily with the model farmers. Others find it more difficult to access opportunities. This was also reported by other farmers for the access to agricultural inputs such as improved seed varieties, fertilisers etc. Moving beyond these powerful farmers in establishing a project is a particular challenge, as I experienced myself. Upon entry in the community the DAs are the main contact persons, who will then introduce the project team to the model farmers. The model farmers then become the contact farmers, like the local contact farmer in the GWP, who also abused his position to help his own family and friends first of all and even consciously excluded others.

This problem is related to the fact that extension work in Ethiopia is political (Berhanu 2012). I already discussed this in chapter 4. The DAs are not only responsible for passing on advice on agricultural issues, they are also the extended arm of the government in rural areas (compare also Harrison 2002). Their job is to 'mobilise' farmers for example for SWC works, and to align them to current government policies by holding meeting after meeting where the farmers receive instructions.

Exclusion can also be a problem for scientists – as the field day in chapter 5 has shown, the scientists were not able to blend into the farmers' social world during the field day in Galessa. Many of the scientists felt uncomfortable, and did not understand the presentations and conversations when they were in Oromiffa, some did not understand Amharic either. At the workshop in Addis Ababa the international scientists were excluded to some extent due to the language issue – they could not follow the presentations in Amharic, even though the slides were in English. I found that difficult myself, at that time my knowledge of Amharic was still very limited.

How the farmers perceive scientists can influence how they interact with them. In Ambober farmers perceived AR as an extension officer from the government. In Galessa the farmers after long time of cooperation understood the role of scientists as representatives of HARC. However, this has also created many expectations, as discussed in chapter 3. During the interviews in Galessa my translator (who was known to work for HARC as well) was really struggling in the beginning to get an honest appraisal of HARC and what they were still expected to deliver. We had the impression that the people we interviewed in the beginning had been instructed to talk to us in a certain way. Only after staying in the area a long time and establishing a good working rapport with local people based on trust and mutual respect did we manage to overcome these barriers. This showed me how scientists who are often not aware of this and do not invest time in building close relations with farmers can become excluded from their knowledges, value systems, attitudes and practices. They will only be able to access what the farmers' have agreed to share with them – the rest remains a hidden transcript (Scott 1990). This is a powerful argument against the use of rapid appraisal methods such as some RRA and PRA tools that are applied during short field visits and then used to draw conclusions that can have huge implications for the lives of the people affected. Similar findings have been reported by Crewe and Harrison (2000), Mosse (2005) and others.

Scientists' social worlds in fact are not so far away from the farmers': many of the scientists I interviewed had a personal background related to farming. Remembering this helped some of them to overcome the dichotomies between farmers and scientists that otherwise persisted throughout the conversations I had with them. Unfortunately even those scientists, who told me personally about their appreciation of farming and farmers, spoke differently when I heard them speak publically at professional workshops and conferences (see chapter 4). In reality there is often an overlap in their observations of natural phenomena or in their evaluation of agricultural practices. Unfortunately among many scientists and some farmers the narratives that dominate are those which portray farmers as ignorant and technically backward. From this perspective, farmers are constructed as poor stewards of their environment and and the chief culprits of land degradation in the Ethiopian Highlands (see 1.4.3.3 and 4.3).

In the case studies I examined farmers and scientists had an opportunity to better understand each other, and to acquire new knowledge. However, even in these contexts, time and resources were limiting factors. Consequently, AR and GR were forced to focus on collecting data for their theses and potential publications, and the time and financial resources for engaging actively with farmers were extremely meagre. In their social worlds they must

present reports with facts and numbers, graphs and tables, to deliver credible 'scientific results'. Incorporating qualitative research and investigating social structures, personal histories, values systems, roles and identities of different actors in the project would have been important but were beyond the scope of their small projects. It would also have exceeded their expertise, and there were no funds planned for social scientists to work with them. At the outset it seemed to them and their supervisors that social research should follow the same scientific logic as ecological experiments, therefore it could be done by natural scientists even without specific training. Eventually, quantitative surveys and some PRA methods were applied, as common in many other projects and doctoral theses I have come across in Ethiopia. I discussed the methodological challenges regarding this perspective in chapter 3. In this situation it was not easy for AR and GR to take time to learn from farmers, to exchange knowledge with them, and to develop better relationships. Both of them did develop a good relationship with the farmers, but both of them would have liked to continue working longer with them. Similarly, farmers both in Galessa and Ambober expressed their wish for continued cooperation rather than short and interrupted chains of projects.

In the case studies I came across the prevalent assumption among many scientists that everything farmers know must be especially appreciated, even celebrated. This may be due to a lack of contextual information. The visitor from outside or even from abroad on a short tour to the field site gets a glimpse of the social world farmers are living in and he or she is unable in this extremely short period of time to differentiate the diversity and complexity of social structures in the villages. Yet visitors are, on the other hand, capable of understanding the diversity and complexity of the agro-ecology in the area. I experienced this challenge myself when I could not spend as much time in the villages as I wanted to. Understanding the social world of farmers requires a lot of interaction over a longer period of time. Otherwise misapprehensions can occur that serve to reinforce existing power structures or even create new ones.

There is also a risk of distorting existing knowledge. Long and Villareal (1994) mention that, in situations where farmers have already found solutions to their production problems, scientific knowledge introduced by extensionists marginalises their knowledge. Mosse (2005) goes even further in claiming that due to hierarchies of power projects comply with external donor policy theorising rather than reflecting on their organisation or on their own social reality: ' Projects remain forever *projections*' (Mosse 2005: 233). The written word and the narratives going along with it gain power over the project's meaning and its perception of success and failure,

and shape its interpretation and constructions. In this research the two case studies also produced proposals and reports discussed in chapter 3, and the representation of the projects to the donor did not provide an accurate reflection of successes and failures; rather the projects seemed to be clear-cut success stories (compare 3.4 and 3.5). But no project will ever be such an unequivocal success story – there are always lessons learned, mistakes made and risks that become realities. If donors continue to insist that projects must ideally become ‘best practice’ or ‘model case studies’ then donors will also not benefit from multiple knowledges and ways of knowing, and they will not engage in open-ended learning. Rather projects will remain confined to logframes and model-based, deductive exercises projecting a reality that in life never exists (Mosse 2005).

This concept of ‘arenas’ (Strauss 1978) can also be applied to the farmers’ social worlds. For example, in Galessa, the geographical delineation in a watershed created a bio-physical boundary that through the project became a boundary within the society as well. The farmers participating in the project, authorised by the fact that they resided within that boundary, became socialised in the project as participating farmers. They started to develop their own social world where certain representations, modes of communications and symbols emerged, and where goods and knowledges were traded. Within that social world multiple subworlds exist, with arenas of agreement and disagreement between them. Thus social worlds can also be related to places for living or working or to places one feels attached to for other reasons, such as a place associated with a powerful memory.

Enrolment and participation interfere with social structures in local communities and thus with power. Equally, power relations and hierarchies strongly persist in the project framework, where scientists and farmers do not perceive each other as equal actors. Yet neither case study reflected such issues, and the farmers who cooperated with the scientists were never critically evaluated as to their positions within the community. Of course, labels such as 'poor' and 'marginalised' are contested concepts and can be inherently patronising (Klouda 2007). Yet not considering the impact of project interventions on social structures can have deeply disturbing impacts on social worlds, and the long-lasting effects may not always be of a positive nature. Science cannot free itself from its responsibility for such unintended consequences.

It seems to be a core issue that the scientists are often not aware of who the farmers with whom they are working are. Their position within the community and their representativeness

are hardly assessed in detail. There is usually no scope in projects like the case studies to really assess the social structure of the villages in depth, and to understand power and ways of knowing within the villages. But these deeply affect how the cooperations between the scientists and the farmers will manifest themselves. A good example for this is Galessa, where a lot of trust, knowledge and resources were given to a single person, but it was never assessed in a systematic way to what extent this knowledge has flowed into the community, or the benefits to the community of the resources allocated to him.

For the farmers it was clear that not everyone among them is the same. Understanding those differences properly needs much more attention, much more social and ethnographic research, and specific analysis of the context in such projects. It requires exploring differences of gender, age, poverty, ethnicity, etc. in an in-depth way, to a greater extent than I have been able to do in this thesis. Most of the time the bio-physical components dominate over the social concerns and little attention is paid to people and their social worlds. Even the planning of research on the social dimensions of natural resource management often remains in the hand of natural scientists who consider themselves competent enough through their on-the-job experiences to handle such issues, and only few recognise the need for social science (Harrison and Watson 2012).

Relations are at the core of the cooperation between farmers and scientists and require much more attention. Scientists and farmers often have highly idealised expectations of each other that are hard to fulfil. Scientists do not have the time and resources to explore those expectations. And partly these expectations remain implicit. The farmers' working hours frequently clash with the short field visits of scientists. While the scientists inspect the spring, the nursery and the implementation of technologies in homestead areas, the farmers may be working in the fields far from home. Or they may be spending time at the market, exchanging knowledge with other farmers and sellers coming from outside.

In Galessa the farmers sometimes took part in the research activities themselves: they took on the role of the researchers. In Ambober the farmers were only doing labour to assist the researcher, but they were also observing with a mixture of curiosity, suspicion and amusement what the researcher was doing. The results of the research were later ‘translated’ and represented in scientific articles, at scientific conferences and also at farmer meetings and for other audiences.

The two case studies yielded a lot of data. Some of the data were published in the two project managers' doctoral theses, some in reports, publications and books, and even a video was produced about the results of the GWP. The GWP is very well documented; both the INRM and the KEF project yielded a wide range of publications. Both case studies also had project workshops with farmers and field days as well as workshops in their institutions where the research results were presented and discussed. Nevertheless, after project end the involvement of farmers gradually diminished and finally the scientists alone continued to maintain the project idea in presenting the results to different audiences, and in using the results to get follow-up funding for new projects most likely in other areas.

I found it striking to look at the case studies in reality after knowing the KEF project proposals. I still consider both projects as positive examples. But the scientific representation of the facts conveys an impression of perfection that in reality can never exist and that may not even be necessary. But there is always a difference between how research is done and how it is represented. There is a specific, almost coded language scientists use in scientific representations such as publications and presentations. And this language and the symbols and metaphors that are commonly used make it possible to write even about imperfect experiments in a scientifically sound manner without revealing too much of their imperfections.

6.2.4 Research Governance and Farmers' Realities

In this thesis I have addressed how scientists select research approaches and how farmers get enrolled in the implementation of those (Chapter 3). I have then looked at the role of different ways of knowing of farmers and scientists in the case studies, and how some were prioritised over others (Chapter 4). In Chapter 5 I looked at the role of places and relations, and how these influenced the interfaces between farmers and scientists and their ways of knowing. In this section I want to summarise how the above reflections can help to improve research governance and farmer–scientist interactions in research projects.

Farmers, scientists, policy-makers and donors all have different ways of validating knowledges. Farmers assess the situation based on their customs and farming practice: it must be the right place and the right time – while the financial situation of the farm and labour availability are also important criteria. To accept a new technology as valid, they want to see it in practice. If it works, and if it works repeatedly, and if they see this with their own eyes, then it is likely that they will adopt this technology. Furthermore, the technology must fit into patterns of social

life, and it must not contradict social norms or spiritual beliefs. Emotions, intuitions and memories require more consideration in research projects.

Scientists, on the other hand, operate within a complicated network of indicators that support rational ways of knowing: in general, science must abide by an internationally agreed peer-review system that validates whether findings are scientifically valid, novel and innovative. Within their institutions scientists must defend their stand with their publication records and other, internal, criteria. In Ethiopia the policy framework of the government is another important frame. And the research I looked at was funded externally, which means another network of indicators was applied: the criteria of the Austrian Development Cooperation and the Commission for Development Studies (KEF). Such donor-determined project structures are themselves at the root of many challenges encountered in the case studies. Projects have lifespans, farmers have lives, and the two do not always match well together. The outputs expected by projects often do not match with the outcomes needed by farmers.

Science gains authority through its institutionalised practices and linkages to state bureaucracies, development administration and international networks. Authority is established in creating facts, and in producing statistics and publications that are embedded in a system of authority. These are maintained by networks of actors, and epistemic culture (Latour 1987; Haas 1992; Knorr-Cetina 1999; Long and Long 1992). Such epistemic communities may comprise more than just similar ways of thinking; they may encompass similar funding mechanisms and requirements, similar methodology and policy framings (Leach and Fairhead 2002). Epistemic communities provide a certain framework of shared assumptions, framings and narratives that they essentially agree on to conform to their understanding of being scientifically sound. People with similar social backgrounds and languages often develop certain symbols, gestures and code-words as well as places with symbolic meanings. Equally, scientists use their specific terminologies to express their affiliation to a certain group; in manifesting their expertise, in providing evidence that they are knowledgeable to their peers, meet in certain places and use symbols such as notebooks and publish in peer-reviewed journals. By supporting each other's views and positions they become powerful (Foucault 1970): this articulates itself in the development of societies expressed in networks, working groups and associations that focus on certain topics.

In the agricultural research system, research must be applied and farmer-oriented. The annual research planning process determines the research priorities in line with the given policies, and

also aims at consulting farmers on their needs (REFAC, see 1.4.3). Nevertheless, scientists must be ready to defend their use of money in front of politics and society. If they fail to defend themselves accordingly, criticism by peers and representatives of the government can be harsh.

The scientists are struggling with different kinds of issues here: one is the pressure on them to transfer their technologies to the field. Scientists tend to believe they have to convince the farmers to implement their technologies, and they often assume that farmers do not understand ecological problems. Many scientists understand their role as guardians of nature and natural resources, and they also represent the interests of the wider (even global) society – their objective is to preserve the environment, maintain and increase biodiversity and contribute to global ecosystem services and sustainability. But on a national level their task is also to contribute to poverty reduction and development.

Unfortunately little regard is paid to the different ways of knowing of farmers and scientists and the potential that lies in the intersections between them. Considering alternative ways of knowing would enable scientists to engage with farmers on a different level. The probability of reaching a common understanding and agreement would increase, as well as the development of technically and socially acceptable technologies that can also be put into practice by farmers. Focusing on alternative ways of knowing rather than orchestrated participatory processes with predetermined outputs that make farmers feel uncomfortable, or open-ended participatory processes that make scientists feel uncomfortable – after all what is a forester to do if the villagers decide to have a new health station instead of a tree nursery – would be a viable alternative for farmer–scientist cooperations. Scientists' systematic way of collecting data remains alien to the farmers, and the more intuitive approach of the farmers seems somewhat suspicious to the scientists. Thus they both maintain hidden transcripts in their communication; however, the script of the scientists is the more powerful one as they start representing the trees, the soil and the people to the outside world without much possibility for the farmers to influence the ways of telling these stories about themselves and their environment.

Farmers consider knowledge and expertise in different ways from other actors such as researchers and extensionists. They readily share it with one another, at least among neighbours, friends and relatives. However, to be considered useful it must be practical, tangible and successful. Farmers expect a long engagement from researchers, while the latter

are used to coming and going for short visits only. There is, of course, a tension arising from that, and also a different perception of what is significant knowledge. I prefer to differentiate between 'field knowledge' and 'centre knowledge' rather than scientific and local or indigenous knowledge. A conceptual understanding of place in this context is more useful than trying to categorise knowledges according to the actors 'owning' the knowledge. Scientists, farmers and extensionists all have both field and centre knowledge. The communication between these groups is not new and has taken place over decades, so in the case of the Ethiopian Highlands it is unlikely that one would come across a community that has not had any contact with the outside world and has thus maintained its own 'local' knowledge. Equally, scientists after their training frequently go into the field; even if they do not stay in one place for long, they are still exposed to field conditions, and thus their knowledge and experiences become enriched and altered. This, together with their personal backgrounds, blends together those different knowledges. And as they are taking this knowledge back and forth to the research centre, where it is transformed and represented in the more classical scientific modes of representation, it eventually becomes 'centre knowledge' again.

The scientists in the case studies learned that farmers have knowledge that may be hidden from them, knowledge that cannot be assessed empirically and may even contradict known facts – this is not easy for scientists to accept, as it questions the superiority of their own knowledge. It may also be connected to what is termed techno-political cultures by Felt et al. (2009): the social worlds of farmers and scientists may in some cases overlap, but in other cases they may be disconnected. The way farmers and scientists position themselves in relation to technologies often reflects their own contexts and social worlds, their personal histories and cultures, but also their political contexts. Different ways of knowing among farmers influence the way they deal with knowledge and technologies. The access to information and the possibility to innovate and develop their knowledge is important for farmers when dealing with scientists and their technologies.

Perhaps the idea of interactional expertise (Collins and Evans 2007) can help farmers and scientists to move closer to each other and avoid misunderstandings: interactional expertise means that people can understand a specialist talking about his or her own field without being specialists themselves, and specifically without having practical experiences in this field. Interactional expertise develops in conversation with experts (Collins and Evans 2007). Interactional expertise does not mean one is able to *do* science, but to *understand* and *discuss* it (Collins and Evans 2007). And it also means that scientists are able to understand farmers'

knowledges without being able to plough a field. But this requires scientists to engage with farmers' ways of knowing to the same extent as vice versa.

The concepts of social worlds and interactional expertise together can provide a fundamental basis for a better integration of alternative ways of knowing in research projects. If research and donor structures enable repeated and in-depth engagement of scientists and farmers, discussions about each other's expertise and ways of knowing can become possible. It would facilitate the exchange about experiences and each other's social worlds. Finally, the intersection of their social worlds becomes free of narrative and conflict. Interactional expertise can develop and enable the implementation of technologies that are socially acceptable, adapted to the farm level and ecologically and scientifically sound. Such technologies would become a fruitful merger of field and centre knowledge, and would allow both scientific and farmers' ways of knowing to co-exist for mutual benefits.

6.3 CONTRIBUTION TO THE LITERATURE

In this thesis I have combined literature from social studies of science and development studies. It specifically focused on social worlds, ways of knowing, interfaces and narratives. As pointed out earlier (1.1), with this thesis I contribute to literature on critical development studies, political ecology and science and technology studies.

I have shown that understanding ways of knowing is fundamental to understanding the differences in epistemologies of farmers and scientists as well as their intersections. Previous debates in literature have focused largely on the value of knowledges where indigenous and local knowledges are framed as complementary to scientific knowledge but not inherently valuable in themselves. This study has provided evidence that such local knowledges do not exist as isolated entities that require preservation; rather such knowledges are multiple, diverse and dynamic. Farmers' ways of knowing shape knowledges in unexpected ways. A comparison of different types of knowledges and ways of knowing adds no value to the debate. In developing interactional expertise farmers and scientists can reach a better understanding of each others' ways of knowing and knowledges.

The study also adds to critical literature on participation both in development studies and in social studies of science; enrolment and participation in the case studies was well intended, but the political context of Ethiopia is not conducive to empower farmers, so participatory processes take a restricted shape with largely predetermined outcomes. Of course farmers

were allowed to contribute to the debates, and they were allowed to prioritise their problems and concerns. But the approaches had already been selected, and in principle scientists were arriving with already standardised packages. The contribution of farmers, or rather their participation, was more fine-tuning than decision-making and empowerment. My main argument is that in a situation where scientists come with such standardised packages a continuous dialogue that enables the development of interactional expertise will contribute more to farmers' and scientists' ways of knowing. It will also contribute more to the long-term success of their interactions than orchestrated participatory exercises that are often carried out under time pressure to get approval for what in principle has already been decided beforehand.

The concept of social worlds is rarely used in development studies, but it is fundamental in understanding interfaces between farmers and scientists. This research contributes to a better understanding of social worlds in the encounters of farmers and scientists, and it argues that much more consideration must be given to social worlds when farmers and scientists meet. Authority and language assist in reinforcing the view that scientists' ways of knowing and emerging knowledges are superior to others. However, a closer look at social worlds reveals that there are many intersections between the social worlds of farmers and scientists. Equally, their ways of knowing are not always as different as is assumed, as both farmers and scientists share different elements of ways of knowing, such as senses, emotions, intuitions, spirituality, language and reason. How much certain ways of knowing are prioritised over others is not only a rational decision: social worlds also influence such choices.

This research adds the element of inequity to the debate on social worlds. When scientists cooperate with farmers they tend to do so via village representatives or key informants. In Ethiopia these are often members of local political elites or people privileged in other ways such as education and language skills, for example, knowledge of Amharic in areas where otherwise Oromiffa is spoken. Out of necessity and lack of time, such alliances are often welcomed by scientists, who appreciate the support of such farmers to provide entry points into the community. However, careful reflection is required as to who these farmers are, whose interests and knowledges they represent – and which social worlds they belong to. This has implications for their ways of knowing, their representations of the landscapes they are living in and the knowledges shared with scientists. Thus careful consideration of social worlds will avoid looking at landscapes and people with the lens of the privileged and powerful members of the community. It will help scientists in understanding that there are also

alternative ways of knowing and representations of the lives and landscapes they are looking at.

Finally, this research also adds to literature that critically reflects on such representations and visions of landscapes resulting in powerful narratives and framings (see chapter 1). Looking at these from the perspective of both social studies of science and development studies, and how ways of knowing influence such representations, also helps to understand theories on narratives and framings from a different perspective. Common narratives about environmental degradation in the Ethiopian Highlands blame farmers as ignorant and destructive, and they create an image of pending disaster and catastrophe.

6.4 Reflection on Positionality

For this research my positionality had some advantages – I had a sound background in funding policies. I knew how funding guidelines were developed, project proposals assessed and reports evaluated, and I knew the history of the case studies. I also had experience in some research projects in agroforestry and forest ecology. However, sometimes this was also a disadvantage. On the one hand I felt that I had a tendency to normative thinking and that I started to evaluate the case studies rather than trying to understand the different roles of farmers and scientists and particularly their social worlds. On the other hand I also felt that my positionality affected how I was perceived by others, particularly the scientists I interviewed.

At the end of my research I found that researching ways of knowing was a difficult task under the given circumstances. I felt that I had possibly missed out on aspects of ways of knowing that I would have been interested in. I believe that this happened because I did not have enough time in the field; and because I did not have adequate language skills in Amharic and Oromiffa myself. And some scientists felt uncomfortable when I was addressing issues of social worlds and alternative ways of knowing. I hesitated to ask more questions when I felt someone was not comfortable with the topic. And, these interviews were in English and often there was also a gap between my Austrian English and my colleagues' Ethiopian English that lead to misunderstandings.

Finally, I found it hard to move out of thinking in categories of 'farmers' on the one hand and 'scientists' on the other hand. I would have liked to present a much more differentiated representation of the people involved in the case studies. After all my training as ecologist and

agroforester left a deeper imprint on my way of thinking than I thought, and it took a lot of effort to avoid too much unwanted categorisation.

6.5 POLICY IMPLICATIONS

The most important policies that have shaped agricultural research and extension activities in Ethiopia over the last years were the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) and more recently the Growth and Transformation Plan (GTP). There is a lot of emphasis on infrastructure, service sector and industrialisation in the GTP, but the agricultural sector is still the largest and most important in Ethiopia. In reference to agricultural development the GTP presents model farmers as role models for other farmers to follow. The implicit assumption is that if model farmers can be successful, others can do the same.

Model farmers play a prominent role in the GTP, but in reality they are a small and privileged group whose ways of knowing and accessible resources may sometimes diverge substantially from the rest of their community. Model farmers probably have more land and more access to information, and often they can access agricultural inputs before other farmers. Thus it is problematic to claim that all that is needed is to increase the efficiency of the others to reach that level. Building policies like the GTP on the role model of such farmers seems unrealistic, as the reasons for not adopting technologies are rarely the result of ignorance as is often assumed by policy-makers and scientists alike. These are much more complex and often rooted in paying little attention to different ways of knowing of farmers and scientists, and the fact that technologies must be adapted to farmers' ways of knowing, their social worlds and the specific local agro-climate in order to be feasible for adoption by farmers.

In light of the current developments in rural areas of Ethiopia, policies on agricultural development and forestry management in Ethiopia require some major revisions. First of all, agriculture and forestry have to be recognised as being integrated elements of farmers' social worlds and cannot be separated. Maintaining separate forest policies does not correspond to farmers' realities, as this study has shown. Historical land use as represented by farmers also indicates a continuous flux between forests, fields and grazing areas. More careful reflection in policies related to trees and soil are needed regarding complexities and diversity in land-use histories, different tree species, soil types and agro-climates; and regarding farmers, extensionists, scientists in terms of their social worlds, their identities and socio-economic

situations, their hopes and aspirations, as well as their different visions for the landscapes they are living and working in.

For development practice the findings of this research have major implications. If there is no scope for participation that empowers farmers to the level of decision-making, it is not meaningful to use the term participation. Consultation, making priority lists that are later reworded and refined by scientists, hiring farmers for labour, and collecting consent for decisions already made does not empower farmers; on the contrary it reinforces a *feeling of powerlessness*. Rather, alternative forms of dialogue should be sought that enable a meeting of different ways of knowing and the development of interactional expertise that will be supportive for mutual understanding and long-term cooperations between farmers and scientists.

To enable this, changes in funding policies are required: donors frequently prescribe guidelines that specify the use of logframes, and lists of criteria and indicators that will be used to evaluate the success of the funded projects later (in terms of measurable 'impacts' and 'outcomes'). Such strict frameworks assume a unity and similarity among research for development projects that in reality cannot exist. Multiple actors and multiple social worlds meeting at the interfaces of such projects can never fit into such pre-designed frameworks. Consequently, scientists are forced to adapt their projects to those guidelines, predicting already at project-planning stage the objectives, activities and results of the project and how the beneficiaries will benefit from this project. Project durations are strictly confined to two to three years – which is nothing in the lifespan of farmers, who expect a long-term cooperation. After all, farming does not stop after two years, and new challenges will come that require new knowledge to find solutions. However, by that time the project will usually be over, and the scientists will have moved on, often leaving farmers alone with new problems created by the intervention, or sometimes with the sad afterlife of a terminated project resulting in memories and failed expectations only. This could be avoided by funding fewer small, scattered projects. Instead the focus should be shifted to larger projects of longer duration with a carefully planned phasing out that the farmers are also aware of and actively participate in.

Similarly, participatory processes taking into account local diversities of knowledges, opinions and landscapes do not find a real place in such rigid frameworks. Eventually successes already predicted at the outset will then be reported in the project report template while learning and

change processes and perhaps even failures will not be reflected and important opportunities for learning will be missed.

6.6 Gaps in Analysis and Future Research Directions

With this thesis I aimed at reaching a better understanding of the ways of knowing when farmers and scientists meet in research projects on tree and soil management. This required studying not only the social worlds of farmers, but also the social worlds of scientists. While this thesis has provided many answers to the questions asked at the outset, it has also raised new questions. Ways of knowing of farmers and scientists in Ethiopia are deeply influenced by historical processes – issues of trust and sharing often stand in the way of communication between them. A more detailed study on this culture of distrust, individualism and the fear of sharing knowledge with others from a perspective of cognitive psychology would add interesting new findings to understanding ways of knowing of farmers and scientists in Ethiopia. It would also help to understand the imminent fear of sharing one's successes and achievements with others that prevents people from sharing knowledges. Understanding these barriers would also assist in better addressing resulting constraints in research projects and other development interventions.

From the beginning of this research to the write-up of this thesis I was struggling with the issue of categorisation. I tried to avoid talking about farmers and scientists as if they were different categories, because I believe that no one is just one or the other. Such categories tend also to reinforce existing narratives and framings. However, I failed to find a way of representing the results without using the same categories again. Future research on farmers' and scientists' ways of knowing should really aim at working without these categories from the beginning. Applying more theories and insights from philosophy and psychology would certainly help to come up with more differentiated and nuanced representations of their ways of knowing as I was able to produce.

Another aspect that I could not cover refers to dialogic forms of negotiation, knowledge sharing and their impact on ways of knowing. This aspect was something that I started discussing with farmers and scientists at the end of my thesis research, but it was beyond the scope of this research to find answers to this. It would be extremely useful to understand which modes of communication would help farmers and scientists to develop interactional expertise. Such forms of dialogue must be adapted equally to both social worlds and ways of knowing.

In order to understand communities of knowers, an analysis of social networks would also yield interesting new insights. This could be linked to the concepts of social worlds and ways of knowing, and also to differences amongst farmers and amongst scientists - and would help to understand how communities organise themselves in terms of acquisition of new knowledge and sharing of existing knowledges, as well as in the continuous adaptation of their knowledges and ways of knowing.

Finally, a detailed study of local historical representations of land-use changes in the Ethiopian Highlands is missing. The public debate repeats narratives and framings produced by policy-makers and scientists both in Ethiopia and abroad. But there are very few studies that attempt to address local views of the changes in the Ethiopian Highlands over time. An in-depth perhaps anthropological/environmental history study which looks at different local representations in different parts of the Highlands, from semi-urban to rural up to extremely remote areas, would yield a much clearer picture about the changes of landscapes in the Highlands and possible explanations of what triggered those changes. This would certainly help to create a much more realistic and fairer representation that seeks to blame not only farmers and overpopulation but also provides a much broader perspective about the changes of the landscapes of the Ethiopian Highlands. This would then assist in developing fairer policies and reinterpreting the role of farmers in environmental degradation as well as their future roles in managing the natural resources in the Ethiopian Highlands.

This study however has made a contribution to the understanding of the role of narratives and framings of tree and soil management in research projects. Received wisdoms were used to convince resource users to act in predetermined ways laid out by scientific approaches brought to the villages by groups of scientists. These scientists come with good intentions, however trapped in their institutional frameworks and social worlds and the template laid out by the selected approaches, they do not manage to engage in a real exchange of knowledge, and fail to see alternative ways of knowing of farmers of different backgrounds as salient contributions to the projects. Neither farmers nor scientists manage to access each others' knowledges on a broad and sustainable scale, and their engagement with each other is far from leading to interactional expertise. However, in this thesis I also show examples where such exchanges have happened, and these encounters are promising learning grounds for the future. Such learning grounds can involve different, alternative ways of knowing with spiritual, emotional, sensual, logical and other components involving different actors, diverse in gender,

age, wealth, but also in their visions, aspirations and hopes for their lives and the landscapes they are living and working in.

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APPENDIX 1

KEF Funding Guidelines

Source: http://www.kef-online.at/en/projekte/antragsstellung.html

KEF CRITERIA FOR PROJECT FUNDING

The Commission has defined three main sets of criteria as guidelines for project appraisal, monitoring and evaluation. Project proposals will have to include a logframe representing objectives, activities, indicators of achievement and objectively verifiable indicators and respective means of verification (see 3). The success of project outcome will be measured against these indicators during project duration (mid-term report) and after project end (final report).

Project managers are strongly encouraged to refer to intended monitoring and self-evaluation mechanisms in their work plan and critically refer to these in their reports to the Commission:

1. SCIENTIFIC QUALITY AND VALUE

- Relevance for development cooperation policy and scientific issues of sustainable development relevant to the respective partner country and/or region (accordance to scientific priorities of partner country and/or region as defined in their sector programmes)
- Scientific quality with respect to requirements of the concerned field
- Competence of project partners (in relation to intended project performance) and project manager (evidence of successfully managed projects, experience in development cooperation)
- Contribution to Austrian competence in research for development
- Feasibility of proposed work plan and budget
- Quality of research partnership (equal shares, fair and transparent decision process, evident interest in pursuing scientific cooperation on either side etc.)
- Possibility to influence policy dialogue and implementation of project outcome
- Adequate share of benefits resulting from the use and implementation of project outcome for all partners and strict observance of intellectual property rights

During project planning and implementation the following principles will be relevant for all participating partners (KFPE, 1998: Guidelines for Research in Partnership with Developing Countries: 11 Principles. Swiss Commission for Research Partnership with Developing Countries, full document available from http://www.kfpe.ch/download/guidelines_e.rtf):

1. Decide on the objectives together
2. Build up mutual trust
3. Share information; develop networks
4. Share responsibility
5. Create transparency
6. Monitor and evaluate the collaboration
7. Disseminate the results
8. Apply the results
9. Share profits equitably
10. Increase research capacity
11. Build on the achievements

Examples of indicators: Extent of contribution to sector programmes of partner countries, evident contribution to problem solving, verification of research hypotheses, joint publications, project reports, research results, follow-up projects, establishment of networks, depth and extent/quality of networking.

2. RELEVANCE FOR DEVELOPMENT

- Contribution to poverty alleviation
- Institutional and individual capacity development (development of ownership, empowerment on local level etc.)
- Demand-oriented research according to needs defined by partner countries
- Development or strengthening of local training programmes and research capacities
- Strengthening of local networks and institutions
- Observance of gender roles
- Development of SS and NS networks

- Linkage with existing activities of scientific cooperation
- Consideration of relevant programme links between research, private sector and development cooperation
- Upscaling on a regional level in support of regional networking

Examples of indicators: Evidence of a significant improvement of local livelihoods, outcome of strengthening of local/regional institutions and capacity development, contribution to research goals and priorities of partner country, improvement and dissemination of relevant local training programmes and structures (infrastructure, training, workshops etc.), extent of involvement of women in project activities, developed/strengthened South–South and North–South cooperations, number of networking activities and depth of networks, developed/strengthened links between research, private sector and development cooperation (new partnerships, outcome of existing cooperations etc.) and activities on a regional level (knowledge dissemination), effect of outcome on target group.

3. SUSTAINABILITY

- Exit strategy after project end: demonstrated sustainability at both ends (Austria and partner country)
- Positive and negative effects of project (to be defined together in planning phase)
- Verified mechanisms and criteria for monitoring and self-evaluation (responsibilities, mechanisms, reaction to failure etc.)
- Definition and description of target group
- Formulation of project objectives and utilisation of project outputs after project end
- Local integration of research results in accordance with administrative bodies
- Demonstration of applicability of project outcome on a local and/or regional level

Examples of indicators: Indicators of sustainability after project end, impact of positive and negative effects of project, control mechanisms and consequences of failures, evidence of outcome, benefits for target group, utilisation of results (publications, research, workshops, follow-up projects etc.), extent of integration on a local level (field trials, benefits for local communities, implementation of project results in extension services etc.), involvement of local authorities (number of meetings, utilisation of outcome etc.).

APPENDIX 2

Overview on Agro-Ecology and Social Background of the two Case Study Areas

	CST 1: Galessa	CST 2: Ambober
Altitude	2,900–3,200 m	1,100–2,100 m
Rainfall (mean annual amount)	1,399 mm	950–1,035 mm
Rainfall pattern	Bimodal	Bimodal
Cropping system	Barley, potato, enset	*Teff*, sorghum, fingermillet, chickpeas, maize, beans, wheat
Livestock	Cattle, sheep, horses, poultry	Cattle, goats, sheep, donkeys, poultry
Soil	Haplic Luvisol	Vertisol, Cambisol, Luvisol, Leptosol
Dominant trees of original forest vegetation	*Hagenia abyssinica*, *Juniperus procera, Podocarpus falcatus, Acacia abyssinica, Buddleia polystachya, Cordia africana, Dombeya torrida* subsp. *torrida*	*Olea europaea* subsp. *cuspidata, Schefflera abyssinica, Cordia africana, Acacia abyssinica, Ficus thonningii, Croton macrostachyus*
Common introduced tree species	*Chamaecytisus proliferus, Acacia decurrens, Eucalyptus globulus*	*Eucalyptus camaldulensis*
Population (*kebele*)	536 households	1,000 households
Role of trees	Embedded in culture, tradition and part of spiritual practice Strict government intervention for protection under the Derg	Less embedded, indirectly related to church Strong connotation of government protection, past and present
Ethnicity	Oromo	Amhara, Qemant
Religion	Orthodox, protestant	Orthodox
Social institutions	*Idir, senbaté* *Wanfal* (similar to debo, but intergenerational), *debo* *Jarsuma* (council of elders) Orthodox church *Qallu* Market (Kdamei Gabbea)	*Senbaté* *Maheber* *Dabait* (similar to debo) *Shimagelle* (elders, legal issues) Orthodox church Markets (T'adda, Gondar)
Migration	Not much recent migration	Outmigration of Falasha until 15 years ago, newcomers Qemant and Amhara
Sample villages	Tiru and Sombo (27 households each) Abeyi (40 households)	Woglo (126 households) Wojnie (136 households)

APPENDIX 3

Comparison of Case Studies in Terms of Project Structures, Actors and Interfaces

	CST 1 Galessa **Watershed Project**	**CST 2 Ambober** **Exclosure Project**
Research Project	Federal research system International partner KEF project Doctoral student supervised at BOKU	Regional research system Development partner (bilateral) KEF project Doctoral student supervised at BOKU
Duration of research	> 10 years Case study 2005–2007	Ca 3 years Case study 2009–2012
Previous projects in the area	FARM Africa (participatory forest management)	Joint American Fuelwood Project (plantation) – Derg Regime, state forest
Interfaces	(Joint) field research, on-farm Training FRGs Field days Workshops Exposure visits	Field research Informal meetings Field days
Actors	HARC AHI BOKU University Farmer FRGs *Woreda* Administration PA Administration (=k*ebele)* DAs Former doctoral student	ARARI SRMP-NG (Austrian Dev. Coop.) BOKU University Farmers *Woreda* Administration *Kebele* Administration DAs Doctoral student

APPENDIX 4

Enrolment and Participation in the two Case Studies

Activity	**Galessa**			**Ambober**		
	Participating Actors	***Participation level***	***Outputs***	***Participating Actors***	***Participation level***	***Outputs***
Step 1 Contacting officials	Government organisations (*woreda*, *kebele*/PA) Researchers	Gaining permission, removing potential obstacles	Official consent	Government organisations (*woreda*, *kebele*) Researchers, SRMP-NG Supervisor (via IT)	Gaining permission, removing potential obstacles	Official consent, cooperation of SRMP-NG Identification of adequate place
Step 2 Contacting individual farmers	Farmers (village leaders and their relatives) Researchers, DAs	Informing and consulting	Information flow Familiarity and trust	Farmers (village leaders, Watershed Committee) Researchers, DAs	Informing and consulting	Information flow Familiarity and trust Identification of adequate place and tree species Structures for researchers' entry
Step 3 Calling village meetings	Farmers (village leaders and selected village representatives) Researchers DAs	Informing and consulting Negotiating consent Information given to farmers by researchers/DAs	Informed farmers Familiarity and trust Structures for researchers' entry	Farmers (village leaders and selected village representatives, Watershed Committee) Researchers DAs Church SRMP-NG	Negotiating consent Information given to farmers by researchers/DAs Decision-making	Informed farmers Familiarity and trust Specific site delineated
Step 4 Participatory meetings	Farmers (village leaders and selected village representatives) Researchers DAs	Consulting Decision-making	Priority ranking (lists of farmers' problems and priorities)			
Step 5 Consensus building	Farmers (village leaders and selected village representatives) Researchers DAs	Informing Consulting Decision-making	Priority list compiled by researchers discussed and approved by farmers	Farmers (village leaders and Watershed Committee) DAs SRMP-NG	Decision-making	Structures for administration of exclosure established, bylaws developed, guard hired

Step 6 *Project Implementation*	Farmers (village leaders and selected village representatives) Researchers DAs	Participatory Research (on-farm experiments carried out jointly) Labour (SWC constructions, nursery, spring development etc.) FRGs (on-farm trials) Experience-sharing visits	Implementation of project activities Research results Learning experience (Limited) adoption	Farmers Militia (assistant) Researchers DAs	Labour (SWC constructions, planting, and assistance for biophysical research etc.) Research carried out by researcher / observation by farmers, informing Informal knowledge exchange Interviews FGDs	Implementation of project activities Research results Learning experience
Step 7 *Field days*	Farmers (village leaders and selected village representatives) Researchers DAs *Woreda* Visitors from abroad or from other organisations (supervisor)	Joint farmer–researcher presentations Consulting Informing Knowledge sharing	Information and demonstration, dissemination, knowledge sharing Positive image of project and researchers' work (e.g. to secure funding and international partnerships)	Farmers (village leaders and selected village representatives) Researchers DAs *Woreda* Church Visitors from abroad or from other organisations (supervisor)	Joint farmer–researcher presentations Consulting Informing Knowledge sharing	Information and demonstration, dissemination, knowledge sharing Positive image of project and researchers' work (e.g. to secure funding and international partnerships)
Step 8 *Project workshops*	Farmers (village leaders and selected village representatives) Researchers DAs *Woreda* Visitors from abroad or from other organisations (supervisor)	Researcher presentations, farmers present (approval by presence) Consulting Informing Knowledge sharing Consensus / agreement	Information and demonstration, dissemination, knowledge sharing Positive image of project and researchers' work Agreements for project implementation Support and continued funding by donors, policy-makers	Farmers (village leaders and selected village representatives) Researchers DAs *Woreda* Visitors from abroad or from other organisations (supervisor)	Researcher presentations, farmers present (approval by presence) Consulting Informing Knowledge sharing Consensus / agreement	Information and demonstration, dissemination, knowledge sharing Positive image of project and researchers' work Agreements for project implementation Support and continued funding by donors, policy-makers
Step 9 *International conferences*	Researchers	Researcher presentations, farmers absent Knowledge sharing	Evaluation by an international audience Support and continued funding by donors, policy-makers	Researchers	Researcher presentations, farmers absent Knowledge sharing	Evaluation by an international audience Support and continued funding by donors, policy-makers

APPENDIX 5

Taxonomic List of Trees and Shrubs mentioned (following Bekele-Tesemma 2007)

Scientific plant name	Local name	English name	Introduced/ indigenous	Case study site
Acacia decurrens	Katscha (Oromiffa)	Green / king wattle	Introduced	Galessa
Acacia abyssinica subsp. *abyssinica*	Grar (Amharic)	Acacia	Indigenous	Ambober
Albizzia schimperiana	Katschona (Amharic)	Large-podded albizia	Indigenous	Ambober
Arundinaria alpina	Lemana (Oromiffa)	Mountain bamboo	Indigenous	Galessa
Buddleia polystachya	Amfar (Oromiffa)	-	Indigenous	Galessa, Ambober
Carissa spinarum	Agam (Amharic)	-	Indigenous	Ambober
Carpunia aurea	Sik'ita (Amharic)	-	Indigenous	Ambober
Chamaecytisus proliferus	Mano (Oromiffa)	Tree lucern	Introduced	Galessa
Not known	Tschotschinga (Oromiffa)	-	Indigenous	Galessa
Cordia africana	Wanza (Amharic)	Large-leaved cordia	Indigenous	Ambober
Croton macrostachyus	Bisana (Amharic)	Broad-leaved croton	Indigenous	Ambober
Cupressus lusitanica	Yeferenji−tid (Amharic) or Yeferenji-gatira (Oromiffa)	Mexican cypress	Introduced	Galessa
Dombeya torrida subsp. *torrida*	Danissa (Oromiffa)	-	Indigenous	Galessa
Ensete ventricosum	Worke (Oromiffa)	Wild banana	Indigenous	Galessa
Eucalyptus camaldulensis	Key bahir zaf (Amharic, also used by Oromiffa speakers)	Red river gum	Introduced	Ambober
Eucalyptus globulus	Nech bahir zaf (Amharic, also used by Oromiffa speakers)	Tasmanian blue gum	Introduced	Galessa
Euphorbia tirucalli	Kinchib (Amharic)	Finger euphorbia	Indigenous	Ambober
Ficus thonningii	Shiwaha (Amharic)	-	Indigenous	Ambober
Hagenia abyssinica	Heto (Oromiffa), Kosso (Amharic)	-	Indigenous	Galessa
Juniperus procera	Gatira (Oromiffa), Tid (Amharic)	African juniper	Indigenous	Galessa
Olea europaea subsp. *cuspidata*	Weira (Amharic), Ejerssa (Oromiffa)	African wild olive	Indigenous	Galessa, Ambober
Podocarpus falcatus	Birbirsa (Oromiffa), Podo (English)	Podo	Indigenous	Galessa
Prunus persica	Kock (Amharic)	Peach	Introduced	Ambober
Not known	*Rejji* (Oromiffa)	-	Indigenous	Galessa
Rhamnus prinoides	Gesho (Amharic, Oromiffa)	-	Indigenous	Galessa, Ambober
Schefflera abyssinica	Gitam (Amharic), Lukai (Oromiffa)	-	Indigenous	Galessa, Ambober
Senecio gigas	Osole (Oromiffa)	-	Indigenous	Galessa