An analysis of the impact of land registration and certification on the sustainable use of farmlands in northwestern Ethiopia: a case study

by

ERMIAS ASHAGRIE ABEBE

Submitted in accordance with the requirements for the degree of

DOCTOR OF LITERATURE AND PHILOSOPHY

in the subject of

DEVELOPMENT STUDIES

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: DR DA KOTZÉ

NOVEMBER 2014

Student Number: 4545-005-6

DECLARATION

I declare that ‘An analysis of the impact of land registration and certification on the sustainable use of farmlands in northwestern Ethiopia: a case study’ is my own work and that all sources that I have used or quoted have been indicated and acknowledged by means of complete references. I also hereby certify that the work embodied in this thesis has not already been submitted, either in whole or in part, for any other degree in this University or other institute of higher learning.

5 November 2014

ERMIAS ASHAGRIE ABEBE **DATE**

ACKNOWLEDGEMENTS

First and always, I give thanks and honour to the Almighty God, my saviour, for obvious reasons.

I am sincerely grateful to my supervisor, Dr Derica Kotzé, whose passionate guidance and supervision made this study possible. She assisted me from the initial stage to the fruition of this study. In addition, I would like to extend sincere thanks to Temechew Mekasha, GIS specialist, who assisted me during the selection of study sites with the aid of a topographic map. He also supported me by plotting all the locational maps included in this thesis.

My heartfelt thanks must go to *Ato* Assefa Molla, *Ato* Zelalem Tesfayie, *Ato* Agegnehu Ayiechew, *Ato* Matebe Wondie, *Ato* Kassahun Yibrie and *Ato* Birhanu Worku for their valuable assistance during primary data collection. Four of them served as research assistants and were fully involved in selecting study respondents, moderating the FGDs and supervising the enumerators deployed for interviews. I also would like to extend my appreciation and thanks to all study respondents. I further wish to express my sincere thanks and appreciation to Askal Teklu, *Ato* Aschalew Amanu, *Ato* Esubalew Yihunie, *Ato* Aweke Nibret and *Ato* Tadele Alemayehu for their assistance in the fieldwork.

Whenever the going was tough with this study, I got encouragement from my sweet Mulugojjam Teklu. My sincere thanks goes to her for such love and courage that complemented the difficult journey I passed to pursue PhD work. This study demanded long hours of work, sometimes away in the field, at the expense of my family, yet they stood by me and gave me the necessary encouragement and support. To my dear wife, Muluyie, and Tewabech Wellelaw who shoulder the major nursing responsibilities for my daughter (Tinbite), I thank you for your understanding and patience with me for the many times I had to stay away from home because of this study. Moreover, I got encouragement from friends such as Dr Mulugeta Teka, Eshete Teshome (Shudi), *Ato* Gashaw Abebe and *Ato* Surafel Melak. My sincere thanks go to all such friends.

I would like to extend sincere thanks to my youngest brothers Dr Minale, Dr Endale and *Ato* Selamu Ashagrie for their psychological, material and spiritual support during the study period. I also thank *W/ro* Yeshi Teketel and *Ato* Ashagrie Abebe for their daily prayers and successful parenting.

My heartfelt thanks further go to *Ato* Yoseph Mekonen, *Ato* Feleke Eshete, *Ato* Kassahun Fantayie, *W/ro* Hulager Teklu, *W/ro* Shewayie Hirba, *W/ro* Betha Kebede, *Ato* Belayneh Asres, *Ato* Yidersal Denberu, *Ato* Teramaj Wale, *Ato* Teshome Mebratu, *Ato* Alazar Tilahun, *Ato* Aschalew Deguma and *Ato* Asefa Yesouf.

Finally yet importantly, my sincere gratitude goes to the management of Bahir Dar University for the career development opportunity and flexible working schedule that made this study possible.

ABSTRACT

This study analyses the impact of land registration and certification scheme on sustainable use of farmlands in Debre Mawi and Densa Bahta rural *kebeles* of Amhara region in northwestern Ethiopia, with a view to contributing to the theoretical debate on tenure security and more realistic policy advocacy on the sustainable use of farmlands. Within the framework of qualitative research methodology, the case study approach helps to observe and understand the relationship between land titling and sustainable use of farmlands in Densa Bahta and Debre Mawi *kebeles* of the Amhara region in Ethiopia. Specific methods employed were focus group discussions, in-depth interviews and observation, complemented by context analyses of relevant documents. It was found that land titling has contributed to a high perception of security of land tenure among study respondents. However, results show that land titling has both positive and negative impacts on sustainable use of farmlands. The positive impact of land titling is ascribed to its assurance effect and legal obligation imposed on farmers to adopt proper land management practices. The negative impact of land titling arises from its failure to address the existing inequality in possession of farmlands among the village communities. Failure of farmers' high perceptions of their security of land tenure to translate into sustainable land use practices has implications for the relative importance of productive asset endowments, self-efficacy and risk perception on the sustainable use of farmlands in the Amhara region. Interviewees that follow unsustainable farming practices were endowed with relatively lower pieces of farmland and disadvantaged in possession of other productive assets. They also demonstrated a low level of self-efficacy and a risk-averse attitude to adopting conservation technologies, as they possessed smaller sizes of farmland compared with the village and regional average. The study urges a holistic approach and comprehensive analytical framework to understand the synergy of several factors that affect the sustainable use of farmlands.

KEY TERMS: Land tenure; Sustainable land use; Land titling; Ethiopia; Amhara; Debre Mawi; Densa Bahta; Farming system; Livelihood assets; Conservation technologies; Sustainable farming; Property rights; Social learning.

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List of Acronyms and Abbreviations

ACSI	Amhara Credit and Saving Institution
ADLI	Agricultural Development Led Industrialization
AIDS	Acquired Immune Deficiency Syndrome
ANRS	Amhara National Regional State
BoA	Bureau of Agriculture
BoFED	Bureau of Finance and Economic Development
BoRD	Bureau of Rural Development
CBOs	Community Based Organizations
CSA	Central Statistical Authority
CW	Concern Worldwide
DA	Development Agent
DFI	Direct Foreign Investment
DFID	UK Department for International Development
EBSCO	Electronic Business Source Complete
EEA	Ethiopian Economic Association
EEPRI	Ethiopian Economic Policy Research Institute
EPLAUA	Environmental Protection Land Administration and Use Authority
ETB	Ethiopian Birr
EU	European Union
FAO	Food and Agricultural Organization
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GER	Gross Enrolment Ratio
GIS	Geographic Information System
GNP	Gross National Product
GPS	Geographic Positioning System
ha	Hectare
HEWs	Health Extension Workers
HIV	Human Immune Virus
HP	Health Post
IFPRI	International Food Policy Research Institute
IIRR	International Institute of Rural Reconstruction
ISI	Import Substitution Industrialization
IUCN	International Union for Conservation of Nature and Natural Resources
Kg	Kilogram
Km	Kilometre
LAC	Land Administration Committee
masl	metres above sea level
mbsl	meters below sea level

MDGs	Millennium Development Goals
MFIs	Micro Finance Institutions
mm	Millimetres
MoA	Ministry of Agriculture
MoARD	Ministry of Agriculture and Rural Development
MoE	Ministry of Education
MoFED	Ministry of Finance and Economic Development
MoLSA	Ministry of Labour and Social Affairs
MoWR	Ministry of Water Resources
MSE	Micro and Small scale Enterprise
MSEDA	Micro and Small Scale Enterprise Development Agency
NGO	Non Governmental Organization
NLA	National Learning Assessment
PA	Peasant Association
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PCC	Population Census Commission
PCI	Per Capita Income
PRA	Participatory and Rapid Assessments
PSNP	Productive Safety Net Program
RGDP	Regional Gross Domestic Product
RDPS	Rural Development Polices and Strategies
SARDP	SIDA Amhara Rural Development Program
SDPRP	Sustainable Development and Poverty Reduction Program
SIDA	Swedish International Development Agency
SLA	Sustainable Livelihoods Approach
SLF	Sustainable Livelihood Framework
SNNPR	Southern Nations Nationalities and People Region
SSA	Sub Saharan Africa
TLU	Tropical Livestock Unit
UNECA	United Nations' Economic Commission for Africa
UNISA	University of South Africa
UK	United Kingdom
US	United States
USAID	U.S. Agency for International Development
WBISPP	Woody Biomass Inventory and Strategic Planning Project
WCED	World Commission on Environment and Development
WCS	World Conservation Strategy

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

The aim of this research was to analyse the impact of the land registration and certification scheme on the sustainable use of farmlands in northwestern Ethiopia, with a view to contributing to the theoretical debate on land tenure security and to more realistic policy advocacy. The effect of land tenure security, which is expected to accrue from land registration and certification, on sustainable land management is a contentious area in the literature. This is mainly because of the inconclusive empirical results that arise from methodological and contextual differences.

The study followed a qualitative research methodology and approach in which a case study design was used. The study is limited to observing and understanding the relationship between land registration and certification (henceforth certification) and sustainable use of farmlands in Densa Bahta and Debre Mawi rural *kebeles* in Yilmana Densa district *(woreda)*[1] of Amhara National Regional State (hereafter referred to as Amhara region). Amhara region[2] is located in the northwestern part of Ethiopia, where a low-cost land registration and certification scheme was launched in 2003. To analyse the impact of this new policy intervention on sustainable use of farmlands, primary data were gathered from 96 respondents[3] from the two case study sites *(kebeles)* of Amhara region (see section 6.4.2). A generic analytical framework was used in this study that combines the sustainable livelihood framework (SLF) of the Department for International Development (DFID 2001) and the farming system model of Leeuwis and Van den Ban (2004) (see sections 3.2, 3.3 and 3.4). The analytical framework helped to understand the synergy of multiple variables that mediate sustainable land management practice among study respondents selected from the case study *kebele*s.

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[1] *Woreda* and *kebele* denote local administration hierarchies in the Ethiopian national language (Amharic). District-level and community-level administration would be their equivalents in English. Each *woreda* has a number of smaller administrative units called *kebele*. Each *kebele* administration manages three to five adjacent villages *(got)*. The *kebeles* (areas with an average population of 5000) are the prime contact level for most development interventions in Ethiopia.

[2] Ethiopia is currently divided into nine ethnic-based politico-administrative units called *killils* (regions) and two city administration structures, each of which is further divided into *woreda*. The current decentralized administration system defined the duties and responsibilities of the three-tiered governance structure, that is, federal government, regional state, and *woreda* administration.

[3] The respondents were 60 focus group discussion participants and 36 individual interviewees. They were disaggregated into three groups of land managers (top, moderate and low).

The purpose of this chapter is to present the background of the research topic (section 1.2) and the case study area (section 1.3), along with a brief discussion about the evolution and status of land tenure policies in Ethiopia (section 1.4). This is followed by a discussion of the research problem in the context of the study region (section 1.5), and objectives of the study (section 1.6). The chapter also outlines the motivation for the study and its significance (section 1.7). The chapter provides a brief description of the methodology (section 1.8), ethical issues (section 1.9) and the organization of the study report (section 1.10). The last section provides a short conclusion.

1.2 Background of the research topic

Land tenure is the system of rights and institutions that govern 'access to' and 'use of' land (Binswanger & McIntire 1987; Heltberg 2002:190). However, it varies from one context to another. Common land tenure systems are freehold (private), state (public) and customary (traditional) (EEA 2002:18; Feder & Feeny 1991; Heltberg 2002:193-194). A freehold land tenure system is characterized by private ownership of land, and provides the owners full rights to use, rent or sell their land. It is conventionally believed that this type of tenure system provides incentives to landowners to utilize land in a sustainable manner. A state tenure system is characterized by state ownership of land, and provides the state with the right to allocate land and its use administratively. Although provision of equity through equal access to land might be a positive attribute of a state tenure system, frequent land redistribution often provides little or no incentives to landholders to utilize land in a sustainable manner. The customary land tenure system is characterized by communal ownership of land, in which access and use rights are defined at community or clan level, and is more relevant to subsistence farming systems, where population density is low. In addition, land tenure systems may adjust harmoniously to satisfy the evolving functional needs of agricultural development and population growth. The evolutionary theory of land tenure in sub-Saharan Africa for example asserts that customary land tenure systems have evolved into private holdings, owing to population growth, market integration, and technological progress (Binswanger & McIntire 1987:76; Binswanger, Deininger & Feder 1993:1244). Moreover, formal land administration systems emerged as governments needed coherent and fair tax collection systems for their services (EEA 2002; Heltberg 2002). According to many scholars (for example Bugri 2008; Feder & Nishio 1998; Place 2009), the accepted theoretical framework for examining and evaluating formal land administration systems is the achievement of sustainable development.

Sustainable development urges good governance that promotes a land tenure system compatible with economic growth, social equity and environmental protection (Wallace & Williamson 2006:125).

'Land tenure' is another name for property rights bestowed on the land. Property rights in land can be better described as a bundle of rights to claim over future income or benefits expected from a given land or field (Heltberg 2002). This bundle consists of access, withdrawal, management, exclusion and alienation rights (Schlager & Ostrom 1992). Private property rights to land (complete land title) are interpreted as holding all five[4] sets of rights. Literature distinguishes between four broad categories of property rights in land. Each of these has a defined owner, ownership rights and owner duties. The claims over future income expected from a given land, which arise from a bundle of rights, could be broadly disaggregated into use rights (the rights to grow crops, perennials, and to modify the land) and transfer rights (the rights to sell, rent, gift, mortgage, pledge or bequeath the field). The attributes of the four property rights in land are summarized as follows (EEA 2002; Feder & Feeny 1991; Heltberg 2002):

1. Private property right: The ideal or perfect type of private property right is complete, secure, and transferable, and provides the holder with the rights of possession, transfer, use, change and distraction of the asset.
2. Common property right: This term refers to land under communal ownership where access rules are defined for community or clan membership.
3. State property right: It refers to land under state ownership for which the state enforces access and conservation rules.
4. Open access: It refers to the condition of no property claims or a state of 'non-property'. Thus, with open access, the rights of the owner are replaced by a state of anarchy in which anybody can capture the benefits of a resource.

'The tragedy of the commons' is the title of an article that has influenced attitudes to open access and common property (Hardin 1968). Hardin used the example of grazing land that is open to all comers. In this tenure system, each herdsman keeps as many animals as possible on the pasture, which will maximize his future benefits stream, while the cost of accommodating each additional animal is shared among all the herdsmen. Each herdsman imposes an external

[4] Access and withdrawal rights are commonly termed as 'use rights', while management, exclusion and alienation rights are called 'transfer rights'.

cost on all other herdsmen in terms of reduced resource availability when he increases the number of animals he raises. Eventually, this system leads to destruction of the common pasture. When everybody owns the resource, nobody has incentives to conserve the pasture for future use. The essence of Hardin's argument is that common ownership of pasture and private ownership of animals create conflict between the group's interest and that of the individual, and it is the group's interest that is overridden. In this way, he established a casual connection between the land holding system and resource management. From this, he concluded that the only way out of the paradox lay in privatizing resources or in stating relations backed by external coercive sanctions (Hardin 1968:1245-1247; see also Heltberg 2002; Ostrom 1990). Hardin is often criticized because he confused common property with open access, failing to distinguish between collective property and the property of nobody. Common property denotes resources under communal ownership in which property rights could be vested in the tribe, the village or the clan, while open access refers to lack of ownership and control (Heltberg 2002:193). Resources under open access are prone to degradation since potential users' access is free and unregulated.

The policy implication of Hardin's hypothesis is vesting property rights to land in an individual or the state to avoid the degradation of land resources.[5] Nonetheless, vesting property rights in an individual echoed more in the contemporary globe owing to the influence of neoliberal development theory. This theory is influencing land reform policies of the developing world towards uniformity, based on the economic theory of property rights (Place 2009:1332). The economic theory of property rights[6] asserts that clearly defined individual property rights to land are a crucial factor in shaping productivity, efficiency and equity in agrarian societies. The assumption of rational behaviour[7] of economic agents, which states that economic agents attempt to maximize their utility, given information and risk constraints, is the basic tenet of this theory (Demsetz 1967:348-358). Mainstream economists contend that private property rights to land are vital in guiding incentives to achieve sustainable use of land resources, since this helps in a greater internalization of externalities along with a freedom of

[5] The tragedy of the commons hypothesis is based on the view that individuals or states make better resource managers than user communities.

[6] Coase (1960) and Demsetz (1967) present the basic economic models of property rights. Coase assumes authoritative allocation, while Demsetz assumes autonomous evolution of property rights. Section 2.3.1 provides a brief discussion about the concept of property rights bestowed to land (land tenure security) and its measurement in empirical literature.

[7] The individual is seen as the only actor who, in the course of pursuing his or her self-interest, is potentially capable of marrying the demands of the present with those of the future and thereby making optimal use of resources over which he or she had private property rights.

contract in land market transactions. The general implication of the theory is to avoid unsustainable use of land resources, privatizing land rights and granting a land certificate. Secure and easily transferable land rights are thus theoretically attractive to boost economic agents' attempt in land augmenting conservation investment (Deininger & Jin 2006:1245) to redress critical problems of low agricultural production, poverty and land degradation (see section 2.3.2).

The economic theory of property rights presupposes that privatizing land rights contributes to sustainable land use by stimulating long-term investment in order to improve soil fertility and land productivity. The theory uses transaction costs and imperfect information approaches to analyse the merits of private property rights to land, compared with land tenure systems characterized by customary and state ownership arrangements. The theory contends that formalizing land rights buttresses the investment incentive, since it helps to reduce the economic costs of land litigation and transaction costs of the credit market (Barrows & Roth 1990). Supporters of the economic theory of property rights argue that in rural areas of most developing countries, tenure security accorded by formally registered land title is one of the crucial factors affecting the way households utilize their assets. If tenure is secure, the standard of living is relatively high, given household resources and an environment conducive to production. If tenure becomes insecure, the household becomes less productive, and the standard of living declines. This affects the resource base of the household, forcing the family to reallocate labour and income in a way that may not yield the original level of wellbeing. A lower level of household income can result in a multitude of adverse consequences, such as lower nutritional status, poor health, reduced schooling for children, as incomes fail to cover schooling costs and the demand for child labour rises, as well as depletion of the productive asset base. The depletion of productive assets can affect future viability and sustainability of the household unit and lead to food insecurity and poverty (Binswanger & McIntire 1987; Deininger & Jin 2006; EEA 2002:3).

In many settings, property rights are complex and overlapping, so that their registration in the form of an individual property title may give rise to social crises and political unrest (Deininger, Ali, Holden & Zevenbergen 2008:1789; Feder 1999:4-7). These adverse social consequences occur in a context where information asymmetry and unequal opportunities exist among the richer and poorer farmers for claiming their right. The asymmetry of information and discrepancy of capability to cover up-front expenditures of formalizing land rights could result in land grabbing by the powerful and better-connected elites. This would have the consequence of accumulation of lands by less efficient operators, non-equitable terms of the transaction in the land market, and distorted credit market in favour of 'inefficient but wealthier' operators (Feder 1999:4-7; Fitzpatrick 2006:1016-1021). In addition, the economic theory of property rights fails to acknowledge the synergy that may evolve among social, economic, environmental and political dimensions of sustainable development (see also Fitzpatrick 2006; Schlager & Ostrom 1992). Indeed, the predominant analytical approach used in studying the land tenure systems has been an economic one since the end of the Cold War (EEA 2002:15). The neoclassical economics theory about the formation and evolution of private property rights to land has been contested in the contemporary world (Fitzpatrick 2006). This is owing to a shift in focus in the land tenure debate from equity towards efficiency in the transition from a socialist mode of production towards a market-oriented system (EEA 2002:15; Wallace & Williamson 2006:125). Accordingly, individual 'property rights in land are contemporary issues in the political economy' of sustainable development (Besley 1995:903; Fitzpatrick 2006; Heltberg 2002; Platteau 1996). (A brief discussion of the relationship between land reform and sustainable development appears in section 2.3.)

The proliferation of land titling[8] programmes, which aim principally at growth, peace and sustainable development, is controversial in the African context. Adherents of this land reform justify their argument based on the three conventional views. First, a reduction in the probability of being evicted or otherwise losing land rights provides land users with greater assurance that they will enjoy the fruits of their labour and investment, thereby encouraging them to make long-term investments for sustainable use of farmlands (Besley 1995:909; Platteau 1996:36). It also reduces the probability of unproductive spending on conflict, which has a far-reaching impact on productivity and equity (Deininger & Binswanger 1999:250). Second, transfer rights, through rental or sale, accorded by formal land titling have a double pronged effect in enhancing land-related investment. On the one hand, titled land acquires collateral value to access institutional loans that could finance agricultural and non-agricultural investment. On the other hand, easy liquidation of land and the investments embedded in it, in the case of exogenous shock, increases its expected return to boost land-related investments (Brasselle, Gaspart & Platteau 2002:374). Easy liquidation constitutes a

[8] The term 'titling' is borrowed from Feder and Onchan (1987) and used interchangeably with land certification in this thesis. Though the term encompasses formalizing 'full title deeds' and 'certificate of utilization' in the context of Thailand, the rural land certification and registration scheme of Ethiopia only formalizes certificate of utilization.

precondition for land transactions to more efficient uses, thus maximizing output through production efficiency, and creating the preconditions for labour to move from agriculture to non-agricultural pursuits in the broader context of economic development (Platteau 1996: 37). Third, a formalized low-cost way to demarcate property rights in land is crucial to financial market development in a context where formal lending institutions have imperfect information about borrowers (Brasselle et al 2002:374; De Soto 2000).

On the other hand, many scholars criticize the theoretical benefits of land titling programmes. They argue that getting Africa on a path of land reform that facilitates efficient, equitable and sustainable use of farmlands requires a contextual understanding of the intended beneficiaries and their environment. Their scepticism is supported by empirical studies of Africa (eg Gavian & Fafchamps 1996; Pinckney & Kimuyu 1994; Place & Hazell 1993; Place & Otsuka 2001), which show that land titling has little effect on investment and farm income. This is the result of little or no use of titles for collateral because of incomplete formal and informal capital and land markets, and uncertainty about the value of the document in cases of conflict. In addition, issues of property ownership and permanent land transfer are still a concern in land titling programmes of some countries owing to a host of legal restrictions. For instance, a plethora of legal restrictions accompanied formalizing land rights on transfer and ownership rights, ranging from total prohibition to moderate sanctions in Ethiopia and other African countries (Beyene 2004:63; Deininger et al 2008:1789; Place & Hazell 1993:19).

In theory, legal restrictions on transfer and ownership rights constrain the development of fully fledged land markets. The existence of formal land markets in rural areas is vital for the development of financial institutions, allocation of land to efficient uses and migration of labour towards sectors and areas where its productivity is higher. Indeed these benefits of formal land market could be achieved if other factor markets are equally and efficiently operational in rural areas (EEA 2002:5). Place and Hazell (1993:19) for instance reveal that the virtual absence of institutional lending in Ghana, Kenya and Rwanda arose from other more serious constraints than land titling. Equally, Deininger and Binswanger (1999:250-251) contend that the importance and value of permanent transfer of use or ownership rights to land might be negligible in a context where non-agricultural opportunities and regional migration are limited.

Overall, the notion that greater tenure security provides adequate incentives to land-related investment is an important element in the literature (eg Besley 1995 in Ghana; Feder & Onchan 1987 in Thailand; Gavian & Fafchamps 1996 in Niger; Lin 1992 in China). However, empirical studies in Africa and elsewhere have produced inconclusive results on the relationship between tenure security and land-related investment (see Brasselle et al (2002:377) for a summary table of African studies). In spite of the conventional belief, only a few studies have confirmed that tenure insecurity is a serious impediment to land-related investments, confined largely to Asia and Latin America (Ayalew, Dercon & Gautam 2005:6; Deininger & Jin 2006:1248). Additionally, only a few studies have confirmed the 'mono-directional relationship' (Neef 2001:125) and some have affirmed reverse causality (eg Besley 1995; Deininger & Jin 2006; Place & Otsuka 2001; Sjaastad & Bromley 1997). Moreover, some (eg Brasselle et al 2002; Rahmato 2004; Pinckney & Kimuyu 1994; Platteau 1996) argue that the customary tenure system in Africa, where it exists, has the necessary elements to stimulate small-scale investment. Consequently, they underscore that formalizing land rights alone might not be a panacea for problems of low agricultural investment, unsustainable land use and low productivity. This casts considerable doubt on the effect of ambitious land certification and registration schemes for long-term farmland augmenting investment. As Besley (1995:936) notes, there remains a need for a proper understanding of the evolution of property rights along with careful empirical investigation into the links between land rights, long-term investment and sustainable land use. Feder and Nishio (1998:28) also note:

> [Our] model only provides a general framework, and the extent to which it applies to a given country depends largely on the policies, traditions, culture and other specific factors.

1.3 Ethiopia as case study area

Ethiopia covers a geographic area of approximately 437 600 square miles or 1 133 380 square kilometres (Murison 2004:407). Administratively the country is sub-divided into nine regional states and two city administrations. On the principle of decentralized administration, regional states and city administrations have the authority to manage and govern their political, economic and social affairs. Proclamations and regulations have been issued to define the duties and responsibilities of the three-tiered administrative structure of the Federal Democratic Republic of Ethiopia (FDRE) since 1991, that is, federal government, regional state and *woreda* administration. Diagram 1.1 shows the map of Ethiopia by regions.

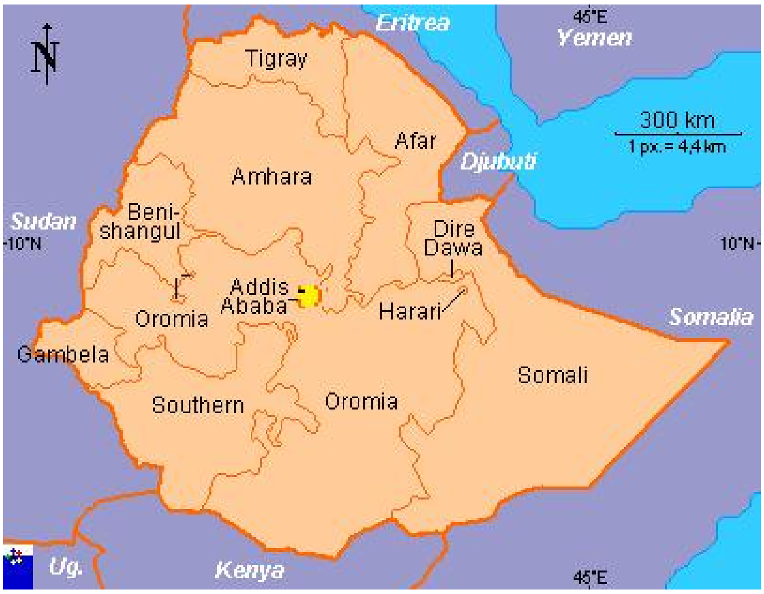

Diagram 1.1 Map of Ethiopia by regions

Ethiopia has an agricultural tradition that is over 2500 years old (Elias 2002:3). However, the land was brought into cultivation at different times in history. The northern part of the country has experienced extensive cultivation for a long time, whereas the southern part of the country, which shows relatively less soil degradation, was brought into cultivation in the last couple of centuries (Hurni 1988:129). In addition, as a landlocked economy with few natural resources, growth in agriculture remains a crucial part of an overall economic growth and poverty reduction strategy. However, the agricultural sector is stagnant and characterized by perpetual low productivity. A number of reasons such as drought, war, pests, land tenure insecurity, population pressure, soil erosion, overgrazing, deforestation, lack of efficient rural institutions, stagnant technology, distorted economic policies, and weak institutional support are usually mentioned for the country's agricultural sector stagnation (Amha 2004:224-225; Shiferaw & Holden 2000:221). In fact, the reasons for stagnation 'are many and complex, but they can be broadly grouped into soil degradation and policy related issues' (Elias 2002:1).

These explanations often lead to solutions that come from outside the community that is facing the multitude of problems. The community's indigenous knowledge of resource management, local institutions and coping mechanisms does not receive sufficient attention in policy debate and technology generation (Adal 2002:27; Elias 2002:4-9; Shiferaw & Holden 2000:221). Accordingly, many soil and water conservation projects have been implemented in the highlands of Ethiopia, on which millions of dollars have been spent since the 1980s (Amsalu & De Graaff 2007:295; Bekele & Drake 2003:438; Shiferaw & Holden 1998:233; Shiferaw & Holden 1999:740). In addition, land-use policies have been contested in political and development debates for over four decades among 'outsiders' (Chambers 1983), since land is the main asset and source of livelihood for the majority of the population. Many believe that land tenure security is of relevance to the policy debate in Ethiopia, since insecurity is higher than other African countries (Deininger & Jin 2006:1277) and good land management is central to sustainable agrarian development (Deininger & Jin 2006:1277; EEA 2002:3). It is also believed that 'international policy discourses on decentralization and community empowerment have infiltrated the political debate and subsequently land policy documents' in Ethiopia (Crewett & Korf 2008:204).

The current government attempted to accommodate contemporary debates by embarking on a large-scale[9] certification scheme in four major regions (Tigray, Amhara, Oromia, and SNNP) of the country. The objectives of this scheme were improved agricultural productivity, land-related investment, and sustainable land management practices, by enhancing the perception of tenure security among smallholders (Crewett & Korf 2008; Deininger, Ali & Alemu 2011). The endeavour had reached more than 6 million households by late 2005 in a participatory low-cost process to delineate borders and issue land-use certificates (Deininger, Ali & Alemu 2008:1793). The rationale behind the scheme was to address the problems of land and environmental degradation, and to create a more enabling environment for investment in the agricultural sector (Crewett & Korf 2008; Deininger et al 2011; Gebreselassie 2006).

The current land tenure system of Ethiopia is characterized by state ownership of all rural and urban lands. The land-user certificate, whose official title is 'Book of Rural Land Possession', is provided to smallholders, while land remains a state property. Accordingly, issues of property ownership and permanent land transfer are still a concern and, hence, the viability of the certification scheme in achieving its intended objectives is controversial. First, though land rental is permitted by law, continued enjoyment of land rights is contingent on permanent physical residence in the village. The law limits the proportion of land for rent and the maximum duration of rental contracts. Second, land mortgaging and selling are prohibited. The absence of efficient land market transactions could restrain the development of the

[9] The Ethiopian land titling programme is the largest land administration programme carried out over the last decade in Africa, and possibly the world (Deininger et al 2011).

financial sector, off-farm employment opportunities and the transfer of factors of production to more efficient uses. Third, a number of grey areas between federal and regional laws lead to confusion and give room for bureaucratic discretion (Beyene 2004:63; Crewett & Korf 2008; Deininger et al 2008:71). This could also lead to arbitrary violation of farmers' land-use rights by local authorities and institutions, which would erode their confidence in investing (Gebreselassie 2006:12). Fourth, the legal framework has some caveats for future land redistribution and provision of inadequate compensations upon expropriation, which really pose the issue of land tenure insecurity in contemporary Ethiopia (Crewett & Korf 2008; Rahmato 2009). Fifth, the country's ethnic federalism discourages and even suppresses an individual farmer's initiative to engage in farming and related investment in other regions[10] (EEA 2002; Gebreselassie 2006).

Section 1.4 examines the evolution of Ethiopian land tenure systems and discusses current land tenure policy and contemporary debate.

1.4 Evolution and status of land tenure policies in Ethiopia

Ethiopia is a landlocked country in the horn of Africa, covering an area of 1 133 380 square kilometres. It is the second most populous country in sub-Saharan Africa next to Nigeria (Murison 2004:407) (see Diagram 1.1 above). The total population of the country was 74 million in 2007, with an annual growth rate of 2.6 per cent (FDRE-PCC 2008). The country's economy is sustained primarily through agriculture, which contributes the largest share to the country's GDP, total export earnings and employment generation (see section 4.3). Subsistence farming engages over 80% of the total population, contributing almost half of the GDP, but frequent droughts and poor agricultural systems have undermined this sector's productivity (MoFED 2005). In addition, land and environmental degradation, land fragmentation, combined with a rising number of landless people in rural areas, and lack of proper incentives for land-related investment are cited as major reasons for stagnant agricultural production (EEA 2002:98). Consequently, an ever-growing population, coupled

[10] The current Ethiopian government resorted to 'ethnic federalism' at the end of the civil war that had prevailed in the country for decades. As a result, regional states were established that were based on the dominant ethnic group in a particular locality. Unlike the resettlement programmes of the previous government, the current government-sponsored large-scale resettlement programme was confined to a given administrative region, which is claimed by policy makers to be a factor that could facilitate the integration of settlers in the recipient community. However, it could indicate the difficulty faced by Ethiopian farmers in accessing land outside their region.

with tenure insecurity or absence of clear property rights, has resulted in the overexploitation of natural resources, especially farmlands, since the mid twentieth century (Adal 2002; EEA 2002; Gebreselassie 2006). In this subsistence production system, land is the most extensively used resource to expand agricultural production, even to ecologically fragile areas at the expense of future uses and generations (EEA 2002:26).

Changes in government have been accompanied by alterations to land-use policy in Ethiopia. Hence, three land-tenure regimes have existed under three distinct political regimes since the beginning of the twentieth century.[11] These are the feudal system of the pre-1975 period; state ownership of the socialist system of 1975–1991; and the semi-liberal and market-oriented system from 1991 to date. Thus, the evolution of these land tenure systems is important in discussing the current land tenure policy and contemporary debate.

Broadly speaking, the pre-1975 land tenure system had diversified arrangements throughout the country and hindered any major land reform (EEA 2002:21). A variety of classifications and approaches are used in the literature to describe this land tenure system. However, for simplicity, Adal's (2002) classifications are used here. According to Adal (2002:3), there were four types of tenure arrangements in the feudal[12] system: *rist* or kinship, private, church and state holding system.

The *rist* or kinship system was the dominant form of tenure arrangement, with some exceptions, in the northern part of the country. It was based on the principle of acknowledging access to land (use and transfer rights without land alienation) by all descendants of a common ancestor in an ambilineal way.[13] It did not guarantee access to land to certain segments of the

[11] The political economy of the pre-1975 period was characterized by a feudal system that encouraged large-scale private commercial farming and import substitution industrialization. The period of 1975 to 1991 was guided by the ideology of socialism in which large-scale private commercial farms were converted to state farms, along with the establishment of farmers' agricultural cooperatives within a command economic system to pursue import substitution industrialization. The post 1991 period has been guided by a 'developmentalist state' ideology that favours multifold prospects of smallholders in a semi-liberal economic system in the face of globalization. The current state also adheres to export-oriented industrialization and foreign direct investment options to bring the required structural transformation in the Ethiopian economy.

[12] The system of feudalism existed in Ethiopia for over a century and was characterized by a land tenure system that varied slightly from one emperor to another. Because of this, the researcher considered the land tenure system of Emperor Haile Selassie, who ruled the country from 1930 to 1974. In this thesis, the term 'feudal system' is used interchangeably with 'imperial regime'.

[13] Land can be claimed through any combination of male and female ancestors. That is, unlike most traditional African systems of land tenure, it is ambilineal (cognatic descent) rather than unilineal. Both male and female

society such as blacksmiths, weavers, and tanners. Within this tenure system, there were two variants of land rights: *rist* and *gult*. *Rist* rights were use rights to a share of ancestral land holdings that cannot be owned or alienated. The individuals or institutions that held land as *gult* had the right to collect taxes from those who tilled *gult* holdings. *Gult* rights were typical forms of compensations for officials before government salaries were instituted. Although *rist* holders were not tenants, their hereditary user rights to the land was conditional on meeting taxes and service obligations associated with those rights, and failure to do so might lead to displacement. The *rist* holder was thus supposed to live near the land for which he or she was claiming. Reduced landlessness and tenancy were the positive attributes of this tenure system, while diminution of holdings, land fragmentation, and persistent litigation over land access were its serious problems (Adal 2002:3-4; Kebede 2002:119-123). This system thus provided 'little incentive to invest and innovate' sustainable farming practices (Beyene 2004:58).[14]

Private tenure was the dominant system in the last days of the imperial regime, affecting the livelihood of some 60 per cent of peasants and 65 per cent of the country's population. It was created largely through a land grant system for those who were loyal to the regime. These land grants were made mainly to soldiers, civil servants, peasants moving southwards owing to land scarcity in the north, local village and clan chiefs, church officials and institutions that facilitated the expansion of the Coptic religion, and provincial elites close to the crown (Adal 2002:4; Ellis 1980:526; Kebede 2002:123-7). Nonetheless, private holders had no absolute transfer and ownership rights, and it was different from the Western concept of freehold, since all land under private tenure was originally state property (Rahmato 2009). Serious land concentration, exploitative tenancy, and tenure insecurity were major problems created by this system (Adal 2002:4; Ellis 1980:526; Kebede 2002:123-7). It gave legal power to landlords to evict tenants from the land they cultivated, and discouraged farmers from investing in long-term land-augmenting practices, including soil conservation and fertility maintenance (Elias 2002:44). Moreover, particularly in the south, land was concentrated in the hands of a few, while there were many 'land-starved' farmers. A significant amount of agricultural land was held by a few elites for social prestige and speculation, as opposed to national development

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children can inherit land from their parents. Hence, the head of a household could claim land from *rist* rights of his parents, as well as his wife's parents (see Kebede 2002:119-120).

[14] *Rist* is a communal form of land tenure that prevailed in northern Ethiopia (currently known as Amhara and Tigray regions) in which all individual members of a particular community claim their access and use right for a common property of their ancestors. There had been periodic land redistributions to accommodate claims, particularly by the generation of young peasants (Jemma 2001). See also Kebede (2002) and Rahmato (2009) for comprehensive discussions and history of the Ethiopian land tenure systems.

objectives (Adal 2002:8-10; Ellis 1980:525). The national development objectives reflected in the three consecutive five-year plans of the imperial regime involved a transition from a subsistence economy to an agro-industrial economy. The emphasis was on improving agricultural productivity by promoting commercial agricultural ventures, along with establishing agro-processing industries (Ellis 1980:529-560).

The Ethiopian Orthodox Church was an important landholding entity during the imperial regime. Its holdings were located in both south and north, with a disproportionate share in the southern part of the country. Apart from the church compound, church lands were given as *semon* land and *gult* land. *Semon* lands were placed at the disposal of functionaries of the church, instead of cash salaries, in appreciation of their services to the church. *Gult* lands were given to administrators of churches and the high priests. Though the church had use rights over those holdings, it rented or collected tribute or taxes over them (Adal 2002:4-5). The positive aspect of church tenure was the preservation of biodiversity on some holdings that was retained in the post-1975 period. Churches that planted commercial and indigenous trees on *semon* holdings adjacent to their compound remained examples of environmental protection (Rahmato 2001:12-13).

Government tenure was established on lands snatched from people in pastoral and other areas. It is estimated that nearly 47 per cent of the country and 12 per cent of its agricultural lands were held under this title (Adal 2002:5). In general, in the pre-1975 period, lands were underutilized and concentrated in the hands of absentee landlords, while arbitrary evictions posed insecurity to the majority of peasants. This 'high inequality of landownership reduced productivity and investment and led to political grievances and eventually overthrow of the imperial regime' (Deininger et al 2008:1789). The political and social question of tenure insecurity was explicitly expressed in events leading to the Ethiopian Revolution of 1974. 'Land to the tiller!' *(Meret larashu)* was the rallying cry of the student and the opposition movement that led to radical land reform in 1975 (Helland 1999:3).

The 1975 land reform of the Derg[15] was a radical measure in abolishing the economic, social and political administrations of the older land tenure system. It abolished tenant-landlord

[15] 'Derg' is a word taken from Geez (language used by the Ethiopian Orthodox Church) that means 'consultation team or committee'. Derg is the name given to the military junta that overthrew the imperial regime, and declared

relationships and benefited social groups that did not traditionally own land, such as blacksmiths, weavers, and tanners (Kebede 2002:128). Proclamation 31/1975 provided for public ownership of all rural lands; distribution of land to the tillers; prohibition of the transfer of use rights by sale, exchange, succession, mortgage or lease; setting a limit of ten hectares for a family; and prohibiting an able adult from using hired labour to cultivate his holdings (Adal 2002:10; Beyene 2004:59). The power of administering land was vested in the Ministry of Land Reform and Administration through peasant associations at grassroots level (Adal 2002:11; Haile Gebriel 2004:84).

As a result, the Derg regime adopted a socialist ideology, shifted the complex feudal land tenure system towards mono ownership, and vested it in the state. Farmers were given only land-use rights (Kebede 2002:125). Absentee landlordism was eliminated, and owner cultivation became legal. Few former landlords retained holdings for their own cultivation based on the criterion of family size that was used for land allocation (Holden & Yohannes 2002:574). However, this uniform land reform failed to take into account the diverse needs of the country and was least relevant to the northern part (Beyene 2004:59). In addition, it was restrictive in such a way that the pillars of property rights, namely transferability and security, were constrained.

The land tenure system of the Derg forced peasants to endure a periodic redistribution of land to accommodate new claimants, with the net effects of levelling down, diminution of individual holdings, and tenure insecurity. Additionally, there was arbitrary land eviction in many parts of the country in the name of villagization,[16] resettlement,[17] establishment of agricultural producers' cooperatives, state farms and related policies of socialism. Though the regime introduced a 'mixed economy'[18] reform in 1990, absence of clear property rights, fragmentation of holdings and a number of institutional disincentives jeopardized sustainable smallholder farming (Adal 2002:11-18) and were the main reasons for the deterioration of traditional land management (Rahmato 2001:38). The pre-reform policies executed by the

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a regime known as 'Provisional Military Administrative Derg'. Thus, Derg is synonymous with Provisional Military Administrative Council (PMAC).

[16] 'Villagization' consolidates fragmented households around the central place of their locality.

[17] 'Resettlement' consolidates households by displacing them to other localities that are believed to have higher potential of cultivable lands.

[18] Following the introduction of a new macroeconomic framework called 'Perestroika' by President Michael Gorvachev of the USSR, the Derg regime introduced a 'mixed economy' philosophy that tried to blend the ideals of socialism with the neo-liberal doctrine of the Western world.

regime also resulted in unsustainable land use and administration. Many state farms and cooperatives were inefficient (Brune 1988; EEA 2002), although they received government subsidies and the best lands were allocated to them (Kebede 2002:131). Moreover, villagization and resettlement programmes[19] resulted in massive deforestation (Kebede 2002:130) and soil erosion (Rahmato 2001:38). The justification for villagization and resettlement was to facilitate rapid improvement in the living standards of subsistence farmers by consolidating them in development villages, which enabled better access to basic social services and created more interactive rural communities. Basic drive to this type of village *(kebele)* structure is to accelerate community development as well as provide opportunities for more efficient use of land and other resources. However, after the announcement of the mixed economy reform in March 1990, hundreds of thousands of farmers abandoned the villagization and resettlement schemes into which they had been driven against their will (see Kebede 2002; Rahmato 2009).

The mixed economy reform stopped the periodic redistribution of land, disbanded all producers' cooperatives, and conferred transferable and lifelong leases on holders of rural lands. The ban on temporary land lease was lifted, and farmer-to-farmer land contracts become official, but the reform did not establish institutional mechanisms to develop formal land markets. In addition, the division of the producers' cooperatives among members caused serious tension between members and the rest of the community in rural villages since members received larger and more fertile land than the village averages (Kebede 2002:129-131).

After the downfall of the Derg in 1991, nobody was certain what course the new government would take regarding land tenure. The Transitional Government of Ethiopia declared that the issue of land tenure would be settled in the process of developing a new federal constitution. By the full agreement of regional parliaments and a two-third majority in a nationwide referendum (EEA 2002:26), public ownership of land was securely deposited as one of the articles of the 1995 constitution. Consequently, the post-1975 tenure system was enshrined in the constitution, and land remained public property, while the semi-liberal regime that

[19] The programmes were executed in the 1980s, but failed to create the development benefits they were supposed to bring about (Rahmato 2009:251-252).

assumed power in 1991 adopted structural adjustment programmes[20] initiated by the World Bank.

The current Ethiopian constitution asserts that all land belongs to the state and peoples of Ethiopia, and will not be subject to sale or to other means of exchange (FDRE 1995, Article 40.3). The right to ownership of rural and urban land is vested in the state, and peasants and pastoralists are granted only land-use rights (FDRE 1995: Article 40.4). In view of this, it is generally argued that there are no fundamental differences between the legal framework of the Derg and that of the present government on rural land-use matters (Adal 2002:18). Adal adds that those belated policy changes made by the Derg in its mixed economy reform seemed to have been consolidated, rather than changed in contemporary Ethiopia. ‘Current policies are the continuation of those changes introduced around the last days of the Derg’ (EEA 2002:27).

However, there are notable differences between the legal framework of the Derg and that of the current regime. First, most of the constraints have been relaxed in the current period. Except for buying and selling land, the legal framework allows sharecropping, short-term lease, and the transfer of land-use rights to legal heirs. The restrictions on maximum land holding of 10 hectares per family, and prohibition of hired labour were not included in the 1995 constitution. Second, the constitution guarantees free use rights to peasants and pastoralists, who may claim compensation for improvements on expropriation (FDRE 1995: Article 40.7). Federal Land Administration Proclamation 456/2005 states the conditions of land expropriation and important items that will be considered for compensation. These may be seen as encouraging farmers in long-term investment and sustainable land use. Third, the constitution grants regional states the authority to administer land and other natural resources, as long as they are consistent with federal law (FDRE 1995: Article 52.2d). This provision has resulted in discrepancies in laws and implementation across regions on issues of redistribution, definition of land-use rights, and titling (Crewett & Korf 2008:208). Fourth, the subsequent Federal Rural Land Administration Proclamation 89/1997 details the conditions under which the regional states accomplish land redistribution in rural areas (FDRE 1997, Article 2, 6). This meant reduced frequency of land redistribution. Fifth, the most recent Federal Land Administration and Land Use Proclamation 456/2005, which replaced 89/1997, affirms a

[20] The new government adopted structural adjustment programmes that abolished agricultural price controls and followed an Agricultural Development Led Industrialization (ADLI) policy to increase agricultural productivity and spur growth linkages with the rest of the economy (see IFPRI 2010).

perpetual use right on farmers' holdings, which will be strengthened by issuing certificates and keeping registers (FDRE 2005). The provision of lifetime land use rights based on this proclamation may be seen as a fundamental evolution to demystify a prolonged fear of expropriation among Ethiopian farmers. Table 1.1 below summarizes the evolution and status of rural land policies in Ethiopia under the three political regimes.

Table 1.1 Evolution and status of rural land tenure polices in Ethiopia

Period	Location	Use	Lease	Donate	Inherit	Mortgage	Sale	Getting land certificate
Pre-1975	Northern	√	√	√	√	X	X	X
	Southern	√	√	√	√	√	√	X
1975-1991	Everywhere	√	X	X	√	X	X	X
Post 1991	Slight variation across regional states	√	√	√	√	X	X	√
√ means rights are allowed			X means rights are prohibited					

Despite this evolution in land policies, rural land policy has remained one of the most serious sources of disagreement and focus of debate among politicians, academics and development practitioners in contemporary Ethiopia. The prohibition of land sale rights, which is common to the three political regimes, is a source of disagreement about the effect of the current tenure system on land-related investment and management, factor mobility, and development of non-farm sectors.

Observers (eg Adal 2002; Crewett & Korf 2008; Jemma 2001; Rahmato 2004) note that the contemporary land policy debate is influenced by ideological considerations, rather than being based on micro-level empirical study. Two political discourses may be distinguished: the discourse of fairness and state protection that favours state ownership; and the neoclassical discourse that adheres to privatization and efficiency. Thus, most present-day debates concentrate on ownership issues and put forward ironical solutions: state ownership versus private ownership (Adal 2002; Crewett & Korf 2008). Adal (2002:28) notes:

> The current debate on the land issues focuses on ownership and on private-state dichotomy. State ownership of land has been strongly advocated by the ruling party and some other students in the field while private ownership is favoured by Western

economic advisors, international organizations like the World Bank, many opposition political parties and some scholars as well.

The political debate between the two ideologies escalated during the third national election campaigns of 2005 (Rahmato 2009:190-191). On the one hand, the ruling party favours state ownership of land, and government officials argue that provision of land certificates in a land tenure system characterized by state ownership is equivalent to private ownership, since landholders have lifetime user rights (Gebreselassie 2006; Rahmato 2009). The government substantiates its position according to two justifications. The first is to prevent undesirable farmer migration to urban areas owing to land sales to a few capitalists (Beyene 2004:62). Though this justification 'places imperial landlords and capitalist farmers on equal par' (Crewett & Korf 2008:205), it is 'precautionary' about and 'anticipatory' of (Haile Gebriel 2004:89) unintended outcomes of private ownership of land. The second justification is to guarantee land for emergent population (Beyene 2004:62). It is based on the belief that state ownership addresses the issue of fairness and equity better than private ownership. On the other hand, some scholars and popular opposition political parties argue that owner-operated farms are desirable for equity and efficiency. Holding a certificate of land use is not equivalent to private property rights in land. It is secured individual rights to land that provide collateral for further investment, which will lead automatically to socially and economically desirable land market transactions (EEA 2002:28-29). It is also argued that prohibiting private ownership implies the exclusion of smallholders from the opportunities that could come with capitalism (Beyene 2004:74). Thus, those in favour of private ownership assert that state ownership creates barriers to the synergy of rural land markets and disincentives to sustainable farming as it perpetuates the legacies of the Derg, which created tenure insecurity, fragmentation of plots and resource degradation. However, there are no thoroughly investigated cases that substantiate these opposing viewpoints (Crewett & Korf 2008; Jemma 2001).

Other positions fall between these ideological stands. Some scholars promote a compromise that formalizes land rentals. They assert that formalizing the informal land rental markets seems to be a logical strategy to reduce inefficiency in the agricultural sector (EEA 2002; Haile Gebriel 2004; Holden, Shiferaw & Pender 2001). Rahmato suggests a third approach, that is, community or associative ownership of land (Rahmato 1994:13-15). He (2004:13) argues that the disincentives of sustainable land use are tenure insecurity and small plots, coinciding with increasing rural population and intra-household competition over parents' holdings. He suggests that customary or traditional land tenure systems have the necessary elements to stimulate sustainable land use. Equally, others argue that tenure security, not land ownership, determines the sustainable use of farmlands. For example, Gebreselassie regarded the assurance effect associated with the current land-use policy as an alternative option to demystify the widespread insecurity of land tenure in rural areas. He notes that 'recent attempts at providing systems of land registration through certification may be one route' in providing assurances for perceived tenure security to enhance land-related investment and sustainable farming behaviour (Gebreselassie 2006:18).

Crewett and Korf (2008) note that the land tenure debate is guided by ideological stands, and contend that the principles of both fairness and efficiency are considered along with contradictory bureaucratic practices in the new 'populist' land policy. They note that 'policy texts' (regulatory provisions) are a hybrid of fairness and efficiency, which pleases donor agencies on their contextual relevance, while the implementation discourse focuses on selected texts that promise the current regime to be popular with the rural peasantry. 'It aimed at increasing "subjective" tenure security, ie the perceptions of farmers about the security of their property rights to their land plots, and their satisfaction with the ruling regime's policies' (Crewett & Korf 2008:211). Thus, development objectives in the policy document such as improved agricultural productivity, land-related investment and sustainable land management are not likely to happen through the provision of user certificates (Crewett & Korf 2008:214).

In general, whether the land registration and certification scheme has an impact on investment and land management, farm labour mobility and the development of the non-farm sector remains an important policy question. It is a sensitive issue. The debate has been mainly among professionals, academicians, opposition groups and the government, while the perceptions of indigenous people have seldom been taken into account. Besides, there is a dearth of empirical studies of the impacts of the current land tenure system on sustainable farming practices.

Against this background, this study explored the perspective of farmers as an important factor in shaping sustainable farming practices, for two reasons. First, in Ethiopia land tenure security alone might not be a sufficient condition for sustainable land management and farming behaviour (Yesuf 2004:205). Second, the issue of land tenure in the contemporary neoliberal globalization period requires broader understanding than in the past (Haile Gebriel 2004:85-88). Therefore, this study intends to contribute to the literature by providing empirical micro-level evidence. It adopted a holistic approach that followed an interactive process over time, using participatory data-gathering tools and techniques, among study respondents from two rural *kebeles* as case studies. Section 1.5 provides the contextual setting for the study area and explains the research problem of this study.

1.5 Research problem

The way in which land tenure is instituted and the consequent perception of tenure security among landholders may directly affect the way in which farmlands are managed (Besley 1995; Platteau 1996; Sjaastad & Bromley 1997). This may have consequences on efficiency as well as sustainability (Deininger & Jin 2006; Holden & Yohannes 2002). To enhance the perception of tenure security among landholders, there is a movement towards formalizing rural land holdings through registered title (Atwood 1990; Fitzpatrick 2006; Place 2009; Platteau 1996). Land tenure security that accrues from land registration removes uncertainty over whether landowners can reap the benefits of their long-term investments (Besley 1995; Deininger & Jin 2006; Feder & Nishio 1998). In view of this, the registration scheme was launched in Ethiopia to enhance the perception of security of tenure among smallholders in order to improve agricultural production and sustainable use of farmlands (Deininger et al 2011).

However, the literature on the relationship between security of tenure and sustainable land management has yielded inconclusive results in the African context. This is partly because the efficacy of land policy in advancing agricultural development and sustainable land management practices depends on other variables, including socio-cultural, political, and geographical factors (Bugri 2008; Gebreselassie 2006; Place 2009). The Amhara region is located in northwestern Ethiopia, where agricultural lands have experienced extensive cultivation for centuries, causing high soil degradation. The region covers a total area of 152 560 square kilometres (BoFED 2006:9) with an estimated population of 17.2 million in 2007 (FDRE-PCC 2008:83). This accounts for roughly 23 per cent of the total population of Ethiopia, while in terms of area, the region constitutes only 15 per cent of the country (BoFED 2011a:4). Approximately 87 per cent of the region's population are rural and are engaged principally in subsistence agriculture, while the remaining 13 per cent are urban dwellers employed mainly in the industry and services sectors (BoFED 2011a:4). The land tenure system, with state ownership of land as its main feature, is regarded as a major contributor to stagnant agricultural production, degradation of farmlands, and agrarian immobility in the region (EEA 2002; Gebreselassie 2006; Rahmato 2009).

Agricultural development is the basis for overall economic transformation, and efforts are geared towards a sustainable increase in productivity by giving due attention to natural resource rehabilitation and conservation. The most recent policy intervention after the 1997 land redistribution provides land certificates to smallholders for the plots they cultivate. The policy aims to enhance farmers' perception of land tenure security for improved agricultural productivity and sustainable use of farmlands. Other social services are provided to reduce the accelerated pressure of population growth on farmlands. The average population density of the region is 116 persons per square kilometre, which is more than twice the national average of 48 persons per square kilometre (BoFED 2011a:7). The majority of the population are below 25 years, which signifies the momentum of the population boom (see section 5.2.2 for a brief discussion).

Most of the region's population are engaged in subsistence agriculture, and are concentrated in the highlands where the soil is depleted, vegetation cover is damaged, and the rainfall pattern and amount are deteriorating. Extensive subsistence agriculture on environmentally fragile areas has an exacerbating effect on the carrying capacity of the land, depletes resources and degrades the environment, in particular through human-induced soil erosion during the rainy season (BoFED 2006:40; BoRD 2003:62; Rahmato 2001:7). Sustainable land management through conservation technologies is rare among smallholders in the region. Accordingly, degradation of agricultural lands is a core problem of development. Possible causes include increased population, the absence of non-farm employment, the current land policy, which discourages rural-urban migration, and ethnic federalism, which restricts the movement of farmers to other regions endowed with more abundant farmlands (EEA 2002:28; Gebreselassie 2006:5). These result in small plots per household that may not even be productive with improved technologies (EEA 2002:58; Rahmato 2009:307). Small plots may also restrain the practice of fallowing and other traditional conservation methods to maintain soil fertility (Gebreselassie 2006:8; Kebede 2002:130; McCann 1995:57; Pender & Gebremedhin 2007:399; Rahmato 2009:124; Shiferaw & Holden 1999:740). Declining soil quality and fertility result in lower per capita food production and household income. This aggravates the core problem because households endowed with lower productive assets may not adopt sustainable land management practices. Selling crop residue and animal manure for fuel instead of using it to augment soil fertility is also a common practice of low-income households (McCann 1995:58; Pender & Gebremedhin 2007:439; Shiferaw & Holden 1999:740). The vicious circle between poverty and land degradation is thus an outcome of cumulative policy disincentives experienced by smallholders in the region.

Disincentives include tenure insecurity, compulsory grain quota at lower price, restrictions on input and product markets, and concentration of research and production packages towards resource-rich farmers and high-potential areas (BoRD 2003:27). Agricultural and rural development practices follow a delivery-oriented package system that overlooks farmers' innovations, indigenous knowledge, and household assets (natural, physical and social). The research agenda is set by researchers and passed through a peer review process, which makes farmers' role in technology generation passive. Equally, the policy agenda is debated among politicians, professionals and policy advisors that often neglect the 'wisdom' of local farmers and micro-level empirical study (Adal 2002:27; Elias 2002:4-9; Shiferaw & Holden 2000:221). In the same vein, the current rural land-use policy of the region, which aims at improved agricultural productivity, land-related investment, and sustainable land use, is contested among these actors. Indeed, in theoretical and empirical debates, the disincentives of land-use policies are blamed directly for the degradation of farmlands in the region. Goals towards environmental protection and improved land management have thus been included in the most recent land administration policy (ANRS 2006). (See also sections 1.3, 1.4, 4.2, 5.2.2.)

Amhara National Regional State (ANRS) has passed three major land laws since it came into existence in 1992. The first was the land redistribution law (Proclamation Number 16/1996 on the Re-allotment of the Possession of Rural Land), which was implemented in some areas of the region in which the social equity criterion (head count) was replaced by political criteria (Adal 2002:20).[21] Land was given to landless youth and returned ex-soldiers in the region by

[21] The 1997 land redistribution, which is based on Proclamation 16/1996, is criticized in literature for politicization of its implementation. The application of the policy was limited to those areas of the Amhara region that were not under the control of the Ethiopian People's Revolutionary and Democratic Front (EPRDF) before the fall of the Derg in 1991. This top-down policy intervention categorized smallholders along 'class' lines. Household heads that were classified as 'remaining feudal' or 'former bureaucrat' were allowed to keep only one hectare of land, while others could keep up to three hectares (Adal 2002; Gebreselassie 2006; Jemma 2001). EPRDF claims that the intervention benefited over 250,000 landless women in the region.

reducing the holdings of farmers who were reportedly associated with previous governments in the 1997 land redistribution (Adal 2002:20; Gebreselassie 2006). This redistribution has affected land covered by perennials, and compensation was not made to former operators, which is contrary to the provisions of the constitution (Holden & Yohannes 2002:577).[22] The second major land law was the proclamation on Rural Land Administration and Use, Proclamation 46/2000, issued in 2000. The third was the revised rural land administration and use Proclamation 133/2006. Proclamations 46/2000 and 133/2006 are the basis for the current certification scheme. Both legislations specify the rights and obligations of certificate holders in a similar manner. Rights to land come with a number of conditionalities with which the rights holder is obliged to comply. Briefly, they include good management of land, undertaking soil and water conservation measures, ability to cultivate the land continuously, and permanent residence in the locality (ANRS 2006: Article 8).

In addition, the regional state formulated the Environmental Protection Land Administration and Use Authority (EPLAUA), by restructuring the Bureau of Agriculture. As well as the regional office, EPLAUA has desks at district level. These desks carry out[23] the rural land certification process. Even if most of the provisions are adopted directly from the federal constitution, the regional proclamation lists the incentives and obligations associated with environmental protection and improved land management. The user has the right to be the holder of a piece of land, to create all assets on the land, to transfer an asset he or she has created, not to be displaced from his or her holding, to use his or her land for agricultural and natural resource development and other activities, to rent a piece of land, to bequeath the holding, to transfer it as a gift, and the like (ANRS 2006, Article 8). Article 8(1) prohibits further land redistribution, except for irrigable pieces of land to benefit the majority of land users. The proclamation also specifies, except for a fallowing period, that if the holder fails to cultivate the land in every production season, his or her landuse rights will be terminated. It imposes a number of obligations on sustainable land management practices as requisites to

[22] Article 40, Sub articles 4 and 5 of the constitution state that peasants and pastoralists have a right to access land free of charge for cultivation and grazing. In addition, they are granted constitutional rights against displacement from their possessions and to obtain compensation on expropriation (FDRE 1995:98).

[23] Though district desks are the lower-level public sector offices that pursue land registration and certification programmes, the village-level certification process follows a sequence of information campaign and committee formation, field adjudication and distribution of registration receipts, and eventually issuance of land certificates. Following a meeting describing the programme, a land use and administration committee (LAC) is elected by popular vote at village level, which assumes responsibility for implementing a labour-intensive and field-based registration process.

retaining user rights (ANRS 2006: Article 20).[24] Thus, the proclamation 'specifies both rights and duties' of a certificate holder (Schlager & Ostrom 1992:250). Effective duties thus impose costs on farmers, while effective rights confer benefits (Sjaastad & Bromley 2000:368).

The Amhara land registration and certification programme started in 2003. By late 2005, 2.4 million households (79%) had been registered, 1.3 million provisional certificates had been issued free of charge, and common property resources had been demarcated (Deininger et al 2008:1793). A major feature of the programme is low-cost and decentralized implementation through elected land-use and administration committees (LACs) at village level (see Deininger et al 2008; Deininger et al 2011). The programme promotes gender equality by issuing a land certificate that assures joint land ownership of spouses (see Annex III for the components of the booklet). All these attempts aim primarily at enhancing tenure security for increased investment and sustainable land use, but do not provide the farmer with rights to mortgage or sell the land. The programme thus departs from the approach of traditional land titling that is common elsewhere by issuing non-alienable use right certificates rather than full title deeds.

Though the new rural land-use policy details incentives and obligations to ensure sustainable use of farmlands, empirical evidence is scant. It has not been possible to locate any study that has investigated the effects of land certification on viable land use in the region. A general survey of the literature in a related domain yielded inconclusive results about the effects of land titling[25] on sustainable farming (see sections 1.2 and 2.3.2). In theory, land tenure security accrued from a registered title provides the incentives and resources to farm households for conservation investment. Nonetheless, the net impact of land tenure security on conservation investment would probably vary over time, space, and even types of investment in the same locality (section 2.3.2). In view of this, many scholars (eg Ayalew et al 2005; Bugri 2008; Deininger & Jin 2006; Deininger et al 2011; Place 2009) have suggested a context-specific study in order to understand the impacts of land tenure security on sustainable use of farmlands.

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[24] According to Regulation 51/2007, issued to implement Proclamation, 133/2006, any holder has an obligation to undertake soil and water conservation activities in accordance with customary practice and modern land use method given to him or her through a professional counselling service. In addition, any holder whose land is near a bank of river or gully area must plough his or her land at a distance from the river or gully that is determined by the land administration authority.

[25] The term 'land titling' is used interchangeably with the land certification and registration scheme pursued in the context of the study area. It is debatable whether this scheme can be called title registration, but for the purpose of this study, the researcher assumes that what is being undertaken in rural Ethiopia is a form of title registration.

The research problem of this study is whether the current land registration and certification scheme promotes ecologically sustainable use of farmlands in Amhara region in northwestern Ethiopia. In doing so, the research deals with these research questions.

Research questions

- Which theoretical framework provides a comprehensive understanding of the impact of land tenure security on sustainable use of farmlands?
- What kind of analytical framework helps to identify variables and factors that determine sustained adoption of conservation investment for the sustainable use of farmlands?
- What are the dominant farming system models, livelihood assets and strategies in the Amhara region and the case study sites of Debre Mawi and Densa Bahta rural *kebeles*?
- What are the views, knowledge and attitudes of farmers to the impact of land certification and registration on the ecologically sustainable use of farmlands in the case study sites?
- Which variables and factors affect farming and sustainable land-use practices in Amhara region?
- Which measures could be implemented to promote ecologically sustainable farmland-use practices in Amhara region?

1.6 Research objectives

The primary objective of this study is to analyse the impact of the land registration and certification scheme on sustainable use of farmlands in Debre Mawi and Densa Bahta *kebeles* of Amhara region (case study sites selected from Yilmana Densa *woreda* in northwestern Ethiopia). To achieve the primary objective, these secondary objectives have been set:

1. To provide a theoretical framework for the analysis of the relationship between security of tenure and sustainable use of farmlands by outlining sustainable development approaches, the economic theory of property rights and land tenure security from a sustainable development perspective
2. To explain the SLF and farming model from a sustainable point of view as an analytical framework for the study

3. To discuss the Ethiopian context with the focus on dominant farming system models, livelihood assets and livelihood strategies in rural Ethiopia
4. To provide a contextual analysis of dominant farming systems and rural livelihoods assets and strategies in the Amhara region and the case study sites (Debre Mawi and Densa Bahta *kebeles*)
5. To provide an explanation of the methodological approach applied in this study
6. To examine the views, knowledge, and attitudes of farmers to the impact of land certification and registration on the ecologically sustainable use of farmlands in the case study sites
7. To investigate variables and factors that affect the sustainable use of farmlands in Amhara region by using a generic analytical framework
8. To recommend policy guidelines to promote ecologically sustainable use of farmlands in Amhara region

1.7 Rationale of the study

The inspiration for undertaking this research arose from the researcher's previous career as a development practitioner and inclination towards population and environmental issues in his current location. In this endeavour, the researcher observed two grey areas that require further investigation. First, the researcher has come across many failed soil and water conservation projects initiated in a technocratic approach. Second, many of the existing research findings and project evaluation reports focused on tangible quantitative data that suit to statistical analysis, while intangible (qualitative) aspects of sustainable farming practices were overlooked. Thus, the researcher is motivated to investigate 'the reality from inside rather than outside' (Sarantakos 1998:125) by undertaking this research. Obviously, in development work, research is undertaken for two main reasons: first, to inform a pragmatic solution for the research problem under investigation; and, second, to learn more about issues with a view to influencing policy (Laws 2003).

Despite increasing interest by researchers in the subject matter, there is a gap in the literature that explains the links between land tenure security and sustainable farming in Ethiopia in line with the framework of sustainable development. Researchers have left grey areas to uncover context-specific factors that mediate sustainable farming practice. Earlier studies indicated a dramatic decline in soil fertility in agricultural land in Ethiopia and generalized that disaster is looming (eg FAO 1986; Hurni 1988). The next group of researchers (eg EEA 2002; Deininger & Jin 2006) attempted to link agricultural productivity and associated land-related investment with political developments in the country, and generalized that the constraints of Ethiopian agriculture are related to tenure systems and institutional disincentives of successive regimes. These predictions and generalizations are based on cross-sectional data that assume that, at national level, farmers will continue to degrade agricultural land through extensive cultivation and mismanagement. The validity of such generalizations is doubtful, given the diverse farming systems and complex nature of farmers' land management. Indeed, they used a representative sample to accommodate the diversity in agro-climatic conditions, but not socioeconomic conditions of the country.

The few recent works that use household-level panel data (eg Ayalew et al 2005; Deininger et al 2011; Mekonnen 2009) and cross-sectional data (eg Amsalu & De Graff 2007; Gebremedhin & Swinton 2003; Holden & Yohannes 2002) focused on investigating the determinants of land-related investments and yielded inconclusive results. They attempted to relate perceived tenure security to various types of investment and to show the propensity to invest using an econometric model, while disregarding variables of tacit knowledge. They thus missed dynamic qualitative aspects of sustainable farming practices in their economics reductionism. Those who used cross-sectional data failed to deal with the possibility of land-related investment in explaining or determining tenure security in their econometric modelling. Econometric models that help to deal with this endogeneity problem of tenure security are available in the existing body of knowledge (for example see Ayalew et al 2005; Besley 1995; Brasselle et al 2002; Mekonnen 2009).

Demeke and Hunde's (2004) national study is a similar post-positivist knowledge claim. They emphasized the negative effects of population pressure and declining farm size on sustainable use of farmlands. However, theoretical arguments (eg Pender 1998; Scherr 2000) and empirical works (eg Critchley 2010; Pender & Gebremedhin 2007; Tiffen & Mortimore 1994) show that population growth eventually induces sustainable land management when tenure is relatively secure, and there are favourable conditions for suitable conservation technologies. In addition, the random sampling techniques used by all these surveys have limitations in providing adequate perception results (Babbie 2010:287). There is a great deal of variation in defining and measuring the concepts of 'security of tenure' and 'sustainable use of farmlands'. Moreover, most of the literature sampled for review follows a nomothetic approach to testing hypotheses derived from the theoretical paradigms scholars support (for example see Amsalu & De Graaff 2007; Ayalew et al 2005; Bekele & Drake 2003; Deininger et al 2011; Shiferaw & Holden 1999).

According to many scholars (for example Bugri 2008; Feder & Nishio 1998; Place 2009), the accepted theoretical framework for examining and evaluating formal land administration systems is the achievement of sustainable development. Sustainable development urges good governance that promotes a land tenure system compatible with economic growth, social equity and environmental protection (Wallace & Williamson 2006:125). The synergy among these dimensions calls for prior multidisciplinary rigorous analysis of the possible contextual effects of the envisioned land reform programme. The political sensitivity of land reform issues dictates pilot approaches to be explored before policy interventions are launched on a large scale (Deininger & Binswanger 1999:249). In this endeavour, a decentralized land administration approach is appreciated in the twenty-first century (EEA 2002:5; Place 2009:1333). Land reform is increasingly viewed as an integral element of a broader development process rather than a narrow technical intervention. A study of land reforms in thirty countries indicated that countries that pursue comprehensive and egalitarian land reform ameliorated rural poverty in a relatively short period, and laid permanent foundations for all-round sustainable development (Sobhan 1993). Moreover, effective land reform is accompanied by other institutional innovations and policy reforms (EEA 2002:18), in particular, reforms that could reduce price distortions, and promote efficient operation of other factor markets in rural areas that are vital to realize the attractive theoretical benefits of security of tenure on the sustainable use of farmlands (Atwood 1990; Barbier, Sanchez, Thomas & Wagner 1997:897).

This research thus sheds light on these theoretical and methodological gaps for a complete and in-depth understanding of the research topic, which is the relationship between perception of land tenure security and sustainable farming practise. Its output can contribute to more targeted interventions that assure security of tenure and offer opportunities for social, economic, environmental and political dimensions of sustainable development. Unless a holistic approach is applied to contextual solutions, the current focus on formalizing property rights in land to ensure the sustainable use of farmlands may not achieve the desired results (Bugri 2008; Crewett & Korf 2008; Heltberg 2002). For these reasons, this study challenges the epistemological positions of the neoliberal development perspective. This study considered the sustainable livelihood framework (SLF) developed by DFID (2001) and Leeuwis and Van den Ban's (2004) farming system model to identify variables that determine continued adoption of conservation investment and sustainable use of farmlands. The continuous iteration between practical fieldwork, analysis and reflection in this study helped to uncover the nature, pattern and extent of the relationships among multiple variables that determine the sustainable use of farmlands (Gagliardi 2008; Van de Flier & Braun 2002). A generic analytical framework that combines the SLF and the farming system model was used. This framework served as a basis for observing and understanding the synergy of multiple variables that mediate sustainable land management practice among study respondents selected from the case study *kebeles*. The next section outlines the research methodology of this study.

1.8 Research methodology

The research methodology is informed by the interpretivism paradigm, which appreciates the diversity of human experience within their lived reality. The overall approach is qualitative research, in which a case study design is used (Babbie 2010; Creswell 2009; Sarantakos 1998). Qualitative research involves studies that do not attempt to quantify their results through statistical summary or analysis, but are characterized by adherence to a diverse array of orientations and strategies for maximizing the trustworthiness of study procedures and results (Babbie 2010; Creswell 2009). It seeks to describe aspects of behaviour and other factors that are studied in the social sciences and humanities. A qualitative research approach was favoured in this study since a complex understanding of the issue at micro-level is required (Babbie 2010). The researcher opted for the case study design and adoption of various data collection techniques that help to improve data reliability and validity, which is commonly affected by the subjective nature of qualitative data (Sarantakos 1998). The research design and paradigm are discussed briefly in sections 6.2 and 6.3. To provide a comparative empirical analysis, two case study sites (rural *kebeles*) were selected from the Amhara region.

Amhara is one of four major regions in Ethiopia in which the country has pursued a large-scale and aggressive land certification programme over the last decade (Deininger et al 2011). This region is characterized by homogeneous farming practice. The main ethnic groups in the region are the Amharas, who speak Amarigina (Amharic) as their first language and comprise 90 per cent of the region's population. Other ethnic groups include the Awi (Agew) people, who speak Agewigna; the Oromo, who speak Afan Oromo; and many other smaller groups. The majority of the population of the region are followers of Orthodox Christianity, followed by Islam (BoFED 2006; FDRE-PCC 2008:193). A topographic map was used to select the two case study sites. These are Debre Mawi and Densa Bahta *kebeles*, which are located in Yilmana Densa *woreda*. Debre Mawi is steeper and expected to have a shortage of arable land and higher land degradation. Densa Bahta is flat and assumed to have a better availability of arable land and relatively less land degradation. Thus, the main criteria used to select the study villages based on flatness and steepness of topography provide scientific validity to undertake a 'comparative case study' [26](Babbie 2010:311) in a qualitative field research. Details of the sampling procedure for the study region, *woreda* and *kebeles* are explained briefly in section 6.4.1.

Primary data were collected using participatory techniques such as participatory observation, focus group discussions (FGDs) and individual interviews. Transect walks[27] were conducted in the two case study sites to select study respondents using the farm-plot sampling technique instead of household sampling. In addition, the opinions and judgments of village-level agricultural extension workers were considered in order to obtain the required number of study respondents. Care was taken to select as many diverse study respondents as possible for individual and group interviews based on farm management, which is disaggregated into high, moderate, and low strata. Using a 'quota sampling' technique on these three categories of land management, a total of 48 study respondents were selected per study *kebele*, of which 18 participated in individual interviews and 30 in FGDs. Details of the purposive sampling procedure are explained in section 6.4.2. An explanation of data collection tools and techniques appears in section 6.5.

This research study, which employed various field research techniques, coupled with historical and archival records, aims to understand the relationship between security of tenure and sustainable use of farmlands in Amhara region in northwestern Ethiopia. An important outcome in this study was to obtain more accurate and rich data regarding the underlying

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[26] 'A multiple case study enables the researcher to explore differences in and between cases. The goal is to replicate findings across cases. Because comparisons are drawn, it is imperative that cases should be chosen carefully so that the researcher can predict similar results across cases, or contrasting results based on a theory' (Yin 2003:47). Accordingly, the main criticism of case study method, which is the limited generalization of what may be observed in a single instance of some phenomenon, could be reduced by undertaking a comparative case study across multiple cases (Babbie 2010).

[27] Transect walks are usually done in a group across a given study site to develop transects, or cross-sectional diagrams of the study site in order to observe, discuss and register endowments and problems (Mikkelsen 2005).

determinants of smallholders' decisions about sustainable land management. The study respondents' knowledge of and attitude towards land tenure security and viable use of farmlands are examined from responses to open- and closed-ended statements in the primary data-gathering instruments. Open-ended topic guides were designed for FGDs, while the in-depth interview questionnaire comprised open- and close-ended questions. Close-ended questions with Likert scale comprise five responses such as 'Strongly agree', 'Agree', 'No opinion', 'Disagree' and 'Strongly disagree' for positive and negative statements. Close-ended questions with binary scale, however, provided only 'Yes' or 'No' options. The research methodology is discussed in detail in Chapter 6.

1.9 Ethical considerations

The entire research process and procedures of the study were conducted in due consideration of the ethical principles that social research should follow. The researcher followed proper procedures to secure permission from government officials and community leaders to conduct the study in the selected villages, without giving any false impressions about himself and the research project. The ethical issues applied to research respondents included informed contest, privacy, anonymity and confidentiality (Babbie 2010:64-69; Sarantakos 1998:23-25). Accordingly, standard ethical principles of qualitative research were adhered to in both primary and secondary data collection and processing. Data triangulation was conducted to ensure data quality and accuracy. The validity and accuracy of primary data were maximized through provision of adequate training to the enumerators, use of measures less dependent on the subjectivity of enumerators, simplifying the formulation of questions, and translating instruments into the local language, Amarigna. All but one of the six FGDs were facilitated by the researcher, which provided an opportunity to supervise each step in order to address ethical standards and ensure data quality and accuracy. This role gave the researcher an opportunity to respect the human subjects of the enquiry, have proper communication with study respondents, check data accuracy, and carry out initial data analyses that served as a basis for modifying instruments in the research process. After obtaining the unanimous consent of study respondents to use a recording device, all FGDs were audiotaped during face-to-face conversations, which were transcribed and crosschecked with minutes or notes taken by assistant facilitators to ensure that the report was written accurately with appropriate interpretation of results, free from data fabrication and falsification. Details of the ethical considerations appear in section 6.6.

1.10 Organization of the thesis

The research report has eight chapters, and the rest of the chapters are organized in the following manner. Chapter 2 discusses the theoretical framework for the analysis of the relationship between security of tenure and sustainable use of farmlands by outlining sustainable development approaches, the economic theory of property rights and land tenure security from a sustainable development perspective. It examines the concept of sustainable development along with an examination of approaches to sustainable development and the discourse of development approaches to deal with soil degradation and sustainable use of farmlands. In addition, the chapter addresses the relationship between land reform and sustainable development in which emphasis is given to examining the concept of land tenure security and the economic theory of property rights as subtopics. Moreover, the chapter examines the debates of sustainable land management and the controversy of the nexus between population density and land degradation. The classical school, the neo-Malthusian view, Boserup's model, and the model of neoclassical economics are emphasized to structure the debates associated with sustainable development in general and sustainable land management in particular.

Chapter 3 outlines the analytical framework of the study and explains the sustainable livelihoods framework and farming system model from a sustainable point of view. The chapter examines the sustainable livelihood framework of the Department for International Development (DFID UK). In addition, the chapter examines the farming system model that highlights the theoretical perspectives of indigenous knowledge and social learning in shaping an individual farmers' cognitive system towards sustainable land management practices. The chapter finally presents the analytical framework used in this study, which is a generic hybrid of the sustainable livelihood framework and the farming system model presented in the chapter.

Chapter 4 explains the Ethiopian context with the focus on the dominant farming system models and rural livelihoods framework, including the livelihood assets and strategies in rural Ethiopia (macro-level scenario). The chapter discusses the role of land in rural Ethiopia. This is followed by an analysis of agricultural development trends and the contributions of the sector in the Ethiopian economy. It also examines the evolution of macroeconomic policy frameworks and status of agricultural development policies. In addition, the chapter examines the four broad Ethiopian farming systems in which emphasis is given to the biophysical environment, land-use system, and indigenous land management practices. Moreover, the chapter provides a discussion of livelihood assets and strategies in rural Ethiopia.

Chapter 5 provides a contextual analysis of rural livelihoods in Amhara Region and Yilmana Densa *woreda*, along with the presentation of status of livelihood assets in the case study sites (Debre Mawi and Densa Bahta rural *kebeles*). It offers the relevant meso and micro level scenarios to the present study. The chapter begins by providing a brief about the location, biophysical and demographic settings of Amhara region. It also provides a discussion of the situation of food insecurity, livelihood assets and farming system in rural Amhara. In addition, the chapter provides a description about the location, biophysical environment, administrative structure, and demography and livelihood settings of Yilmana Densa *woreda*. Moreover, the chapter provides a description of the location of case study *kebeles* along with the status of livelihood assets in these *kebeles* during the study period.

Chapter 6 explains the methodological approach used in the study. It begins by discussing the overall philosophical justification and the rationale of opting for a qualitative research approach in which a case study design was used. This is followed by a brief analysis of the research paradigm debate. In addition, the chapter explains the sampling procedure followed to select both the case study sites and respondents, data collection tools and techniques, consideration of ethical issues, and data analysis methods. Moreover, the chapter elaborates on the limitations and strengths of the research methodology.

Chapter 7 discusses and analyses the study results. It begins by providing the major findings in relation to study respondents' perception of land tenure security. The chapter also provides empirical evidence on the perceptions of study respondents regarding sustainable land use and the prevailing environmental degradation in the study *kebeles*. This is followed by an analysis of the knowledge and attitude of farmers towards conservation technologies in the study *kebeles*. The chapter also presents study respondents' perceptions of the impact of land registration and certification on the sustainable use of farmlands. In addition, the chapter analyses and documents the patterns of farming practice towards sustainable land use during the pre- and post-certification periods in the study *kebeles*. Moreover, the chapter shows the synergy of factors that affect sustainable use of farmlands in Amhara region with the aid of a generic analytical framework used in the study.

The last chapter provides a summary of the study and some key recommendations. It begins by providing a short introduction that summarizes the problem statement and primary and secondary objectives of the study. This is followed by a summary of the various chapters and indicates how the objectives were addressed in the thesis. The chapter finally provides recommendations and highlights key issues raised for further research and provides general recommendations for future development practice.

1.11 Conclusion

This chapter provided an overview of the study by pulling together pieces of relevant information to provide readers with a good overview of the study. The chapter began by provided a background to the research topic with the aid of some preliminary literature to highlight the existing knowledge gap this study intends to fill. The advocators of land titling (registration and certification programme) contend that having a registered title improves productivity and sustainable use of land resources in two broad ways: by enhancing farmers' incentives for conservation investment and by opening up access to institutional credit. Greater social stability and increase in the value of land are also expected from land titling. However, the notion that land titling provides the necessary incentives for farmers to manage their land better and invest in conservation technologies is an ongoing controversial issue. In line with this, the chapter indicated the views of cynical scholars whose scepticism is supported by empirical studies of Africa. These scholars contend that before one can validly assert that land registration and certification of title enhances investment and sustainable land management practices, a contextual understanding of the situation of African farmers and their environment is important.

In addition, the chapter examined the evolution of Ethiopian land tenure systems along with the discussion of the current land tenure policy and contemporary debate. Emphasis was given to highlight contemporary debates in relation to the adverse effects of land tenure insecurity for significant degradation of farmlands. This was followed by an outline of the research problem, the key research objectives, and the rationale of this study. A brief delineation of the research methodology, consideration of ethical issues and a chapter outline were also presented in the chapter. The next chapter reviews the outstanding literature to provide the necessary theoretical framework for the analysis of the relationship between security of land tenure and sustainable use of farmlands.

CHAPTER TWO: SUSTAINABLE DEVELOPMENT DISCOURSE

2.1. Introduction

The purpose of this chapter is to discuss the theoretical framework for the analysis of the relationship between security of tenure and sustainable use of farmlands by outlining sustainable development approaches, the economic theory of property rights and land tenure security from a sustainable development perspective. The chapter has five sections, and the rest of the sections are organized in the following manner. The next section examines the concept of sustainable development in which approaches of sustainable development (section 2.2.1) and the discourse of development approaches to deal with soil degradation and sustainable use of farmlands in the developing world (section 2.2.2) are briefly examined. The third section examines the relationship between land reform and sustainable development that comprises two subsections. Section 2.3.1 examines the definition and measurement of the concept of land tenure security in the economics literature. Section 2.3.2 examines the economic theory of property rights in which the concept of land tenure security is highly contested to ensure sustainable land management practices. The fourth section examines debates about sustainable land management and is structured into four subsections: the classical school, the neo-Malthusian view, Boserup's model, and the model of neoclassical economics. The chapter is concluded with a summary of main arguments.

2.2 Sustainable development

The notion of development with reference to countries and people became especially popular after World War II and has undergone significant changes since the 1950s. Theories of development have different starting points and ask particular questions to address certain problems. However, development is not a neutral concept and various conceptualizations of development are reflections of different worldviews that are not value free. During the early days, development was seen as equivalent to economic growth. For this reason, development and economic growth were used interchangeably in the early theories of development. For instance, the modernization theory was informed by the eighteenth century industrial success of Britain that helped to enhance economic growth (Peet & Hartwick 2009:127). The notion of development is thus conceived as achieving higher GDP growth rate within a system of selfish competitiveness, or rational self-maximizing behaviour in modernization theory. In contrast, the dependency theory (theory of underdevelopment) was informed by Marxist social thought on capitalism and its exploitative tendencies (Peet & Hartwick 2009:143). These two divergent understandings of development have certain assumptions associated with them that form the basis for various institutions, knowledge systems, policies and practices.

Peet and Hartwick (2009:199) note that frustration with the inability of various development paradigms and interventions to deal with global poverty, inequality and oppression changed the discourse of theoretical debates on development in the early 1970s. The concern with the question of how development 'should' take place moved to discussions of how development 'actually' takes place. This led to a paradigm shift to a normative approach that contradicts the positivist approaches reflected in modernization and dependency theories.

The 'post-development' (also called 'anti-development') theorists in the 1970s questioned the relevance of the whole notion of development and argued that 'development' is a tool used to entrench Western hegemony over the rest of the world. They saw development theory as being socially constructed, with Western interests guiding how knowledge is generated. They thus rejected any development intervention from outsiders, thereby allowing indigenous people to determine their own future free from Western expectations and judgments (Easterly 2006; Escobar 1995; Morgan 2002). Moreover, concern about the continuously increasing level of poverty in the developing world, along with environmental degradation, despite several years of development efforts, triggered concern in the 1980s for connections to be made between economic growth and environmental protection. This led to a paradigm shift towards sustainable development.

As a result, contemporary development is conceived not only in economic terms, but also in terms of social wellbeing, participation and empowerment, political structure, governance and the quality of the physical environment. In the twenty-first century, development is thus measured not only by per capita income, but also with indicators of the degree of real per capita income inequality, life expectancy at birth, literacy rate, access to social services, freedom of speech and popular participation in government (Ashagrie 2011:4; Benjamin 2001:7; Meier & Rauch 2000:6-8; Thirlwall 2003:327; Todaro 2004:405). The notion of sustainable development has emerged as an international development thinking and practice for those concerned with environment and development dilemmas (Adams & Thomas 1993:594; Norgaard 1994:10-12). It set in motion three mutually reinforcing and critical aims of development discourse: i) the improvement of human wellbeing; ii) more equitable distribution of resource use benefits across and within societies; and iii) development that ensures ecological integrity over an intergenerational timescale (Sneddon, Howarth & Norgaard 2006:255-256).

International discussions contributed to the historical development of the concept of sustainable development and the endorsement of numerous declarations, plans of action and conventions or laws of global environmental governance (Baker 2006:54-79). Prominent attempts include the Brundtland Commission Report, Rio Declaration on Environment and Development, and Johannesburg Declaration on Sustainable Development (Baker 2006; Hackett 2006; Roy 1996). International discussion on 'sustainable development' goes back to the Stockholm Declaration of 1972 and gained momentum after the publication of the Brundtland Commission book in 1987 (Roy 1996:31).[28] The Stockholm Declaration presupposes two premises: first, poverty is a cause of environmental degradation; and, second, scientific knowledge and technical knowhow will be able to address the problems of environmental degradation (Baker 2006:54). The book of the Brundtland Commission, entitled 'Our Common Future', states that (WCED 1987:8):

> Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of the future generations to meet their own needs.

This publication emphasizes three interrelated concepts: humanity's ability to make development sustainable; the necessity to meet immediate needs of the present generation; and the necessity to take into account the needs of future generations. The book shows that sustainable development is a balancing act between economic growth, social equity and environmental integrity, involving the intersection of these three dimensions, with the whole system embedded in a wider context of co-existence with other creatures. Brundtland

[28]The notion of sustainable development came into the public arena in 1980 when the International Union for the Conservation of Nature and Natural Resources presented the World Conservation Strategy (WCS) in which conservation and development were seen as 'mutually dependent', not incompatible (IUCN 1980, in Baker 2006:18). This global strategy is commonly called Caring for the Earth and 'it extends the message and scope of the WCS to an ethic of sustainable living, and explains how to integrate conservation with development' (IUCN 1980:40). Its message emphasizes that 'unless fertility and productivity of the earth are safeguarded, human future is at risk' (IUCN 1980:27). It underlines that sustainable uses of resources cannot be achieved without development to alleviate poverty. As a global strategic framework, world countries are committed to implementing its three objectives: 'first, maintenance of essential ecological processes and life-support systems, such as soil regeneration and protection, recycling of nutrients, and cleansing of waters on which human survival and development depend; preservation of genetic diversity, which is the foundation of breeding programs necessary for protection and improvement of cultivated plants and domesticated animals; and ensuring sustainable utilization of species and ecosystems' (IUCN 1980, paragraph 7).

introduced six normative principles into the global discussion, such as common but differentiated responsibilities; inter-generational equity; intra-generational equity; justice; participation; and gender equality to maintain a healthy dynamic relationship among the three global imperatives. Moreover, it envisioned a process of change rather than a fixed state of harmony between two key issues stressed by its conceptualization of 'needs' of humanity and 'limits' of ecological potential. Accordingly, the Brundtland model sees sustainable development thus (WCED 1987:46):

> Sustainable development is a process of change in which the exploitation of resources, the direction of investment, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations.

The original definition provided by the Brundtland Commission is 'sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED 1987:43). Though this original definition has the essence of regarding a healthy dynamic relationship among the three global imperatives, various scholars have different conceptualizations of this broad concept.

Glipin (1996:206) defines sustainable development as 'development that provides economic, social and environmental benefits in the long term, having regard to the needs of living and future generations'. According to Carley and Christie (2000:28), sustainable development is defined as 'maintaining the carrying capacity of the planet', which has two implications. One is that harvest rates of renewable resources should be equal to regenerative rates. 'The other is that waste emission rates should not exceed the natural assimilative capacity of the ecosystem' (Carley & Christie 2000:28). As Reed (1996) notes, the rationale of sustainable development is harmonizing economic growth with ecological preservation. Thus, since the economy is inter-related to the earth's ecosystem, economic policies should respect the principles of ecology to ensure sustainable development (Reed 1996).

Warburton (1998:70) notes that 'sustainable development allows the use of depletable natural resources in an efficient manner, with an eye to substitution of other resources'. Glipin (1996) notes sustainable development is concerned with intergenerational and intragenerational equity for the quality of human wellbeing. Intragenerational equity considers access to use of natural resources and bearing the burden of externality between the poor and the rich, while intergenerational equity is between current and future generations (Glipin 1996). Obviously, both of them should be regulated by government policies and global declarations.

The Brundtland conceptualization of sustainable development, however, has been subject to criticism in the past three decades. Redclift (2006) argues that it looks simplistic and obscures underlying complexities and contradictions. The concept of sustainability has prompted a number of discursive interpretations because of new material realities, the products of our science and technology, and associated shifts in consciousness. He notes that the concept was initially popularized by linking human needs with the natural environment. Nevertheless, needs are defined differently in different cultures and the needs of any society keep on changing with time. It is therefore unlikely that the needs of future generations will be similar to those of the current generation. In addition, a move from an emphasis on needs to that of rights marked a shift from Keynesian economic theory[29] to neoliberal certainties. Consequently, a focus on choices for individuals and larger social groups led to growing disparities between social and political demands and the allocation of markets. Finally, he heralded the 'post-sustainability' discourses driven by the new symbolic order of Internet and uncertain virtual politics parallel with that of the 'real world' (see Redclift 2006).

There is a renewed interest by scholars and development practitioners in the concept as 'an important watershed in development thinking' (Adams & Thomas 1993; Gow 1992:50; Norgaard 2004). According to Baker (2006:1), Brundtland's model of sustainable development is a challenge to the conventional form of development preached by modernization theory, which sees the development discourse as modernization of the globe along Western lines. Modernization theory came under strong criticism because of the emergence of various forms of environmental degradation against its 'promised control over nature through science, material abundance through superior technology, and effective government through rational social organization' (Norgaard 1994:1). In contrast, the idea of sustainable development marked a shift in thinking on development, environment and governance that raised a bold call to recalibrate institutional mechanisms at global, national

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[29] Although Keynes was a staunch defender of the capitalist system against all known alternative forms of economic organization, he believed that it had outstanding and potentially fatal weaknesses as opposed to the neoliberal certainty and belief on the role of free market for efficient allocation of economic resources. Thus, Keynesian economic policy is 'based on the state playing an active role in the economy', while neo-liberal thinking is based on an 'emphasis on market forces and minimizing the state's role' (Roy 1996:29).

and local levels (Gow 1992; Norgaard 1994; Sneddon et al 2006). The prime significance of sustainable development 'is its integrative power and its capacity to provide a coherent platform for otherwise desperate debates about environment and development' (Adams & Thomas 1993:591). The political significance of the Brundtland publication is that it does not merely address the causes of unsustainable development, but puts forward solutions or pathways to the future (Baker 2006:22; Hopwood, Mellor & O'Brien 2005:39). In addition, the notion of sustainable development focuses on critical issues of equity and environment, and raised important ethical considerations on the trade-off between economic growth and environmental protection that remain highly relevant (Buch-Hansen 1997; Sneddon et al 2006). Accordingly, it is widely believed that a pluralistic approach helps to push forward the notion of sustainable development into more fruitful and pragmatic territory (Hayes & Lynne 2004; Norgaard 2004; Norton & Toman 1997; Sneddon et al 2006). As Hopwood et al (2005:49) note, sustainable development requires an 'appreciation of the close links between the environment and society with feedback loops both ways, and that social and environmental equity are fundamental ideas'.

The notion of sustainable development came into the public arena in 1980 when the International Union for the Conservation of Nature and Natural Resources presented the World Conservation Strategy (WCS) in which conservation and development were seen as 'mutually dependent', not incompatible (IUCN 1980 quoted in Baker 2006:18; Hopwood et al 2005:39). According to McDonach and Yaneske (2002:218), sustainable development requires a balance between conservation ('biospheric requirements') and development ('anthropocentric requirements'). In view of this, an attempt has been made to examine the two broad approaches of sustainable development. The first approach is more in line with the conceptualization of development suggested by IUCN (1980), while the second corresponds more to the concept of conservation defined in WCS.

2.2.1 Sustainable development approaches

Theorists in various disciplines have made efforts to understand the concept of sustainability. Baker (2006:30) summarized these diverse conceptualizations using a ladder that offers a useful heuristic device for understanding the variety of policy imperatives associated with different conceptualizations of sustainability. The four distinct rungs of Baker's ladder represent a particular philosophical belief about nature and about the relationship between human beings and the natural world (see Baker 2006:28-35). Given the diverse conceptualization of sustainability, the mainstream thinking of sustainable development has coherence on four major themes. First, it focuses on global rhetoric and internationalism. Second, it is based on the principles of rational normative planning. Third, it draws upon the application of scientific knowledge (especially ecological science) for its ideas and methodologies. Fourth, continued economic growth is recognized as a realistic means of maximizing human benefits without threatening ecological resources (Adams & Thomas 1993:594-595; Baker 2006:20-23). In view of this, much of the mainstream debate about sustainable development has ignored culturally specific definitions of what is sustainable development (Norgaard 1994; Redclift 2006; Vilei 2011). In addition, the Brundtland model does not articulate universally agreed indicators of sustainable development (Ames & Keck 1998; Fernandes & Woodhouse 2008; Redclift 2006; Steurera & Bergerb 2011; Vilei 2011). Moreover, the definitions given to the concept 'nature' has led to the emergence of two contesting views of sustainability: weak sustainability and strong sustainability (Baker 2006:32-34; Gutes 1995:147; Hackett 2006:402-405; Pearce & Atkinson 1993:104; Victor 1991). This indicates that the symbolic meaning of 'nature' is the source of controversy and reflects the epistemological interests of theorists (Redclift 2006:75). Accordingly, the subsequent subsections examine these two broad interpretations of sustainable development.

The concept of weak sustainability

The concept of weak sustainability has a similarity with the conceptualization of development reflected in the World Conservation Strategy (WCS) of 1980. Development was defined in the WCS as 'the modification of the biosphere and the application of human, financial, and living and non-living resources to satisfy human needs and improve the quality of human life'(IUCN 1980, paragraph 1.4, in Adams & Thomas 1993:592). Weak sustainability reflects the philosophical belief of mainstream economists that adhere to the modernization theory of development. In fact, the modernization theory has diverse meanings for social scientists and philosophers. In economic terms, modernization refers to attaining sustained economic growth through industrialization and urbanization to satisfy non-declining per capita consumption. For sociologists, modernization refers to weakening of traditional ties and the rise of individualization and personal advancement. The political implication of modernization is the rationalization of authority and the growth of the bureaucracy. The cultural dimension of modernization is represented by increasing secularization of society arising from the spread of scientific knowledge (Ingham 1993:1807). In view of this, the concept of weak sustainability could be regarded as a 'mainstream economist's view' (Jaeger 1995) or the view of 'development economists', who contend that development measured in terms of sustained economic growth should be given greater priority than the conservation of environment (Beckerman 1992).

Weak sustainability relies on neoclassical models of economic growth that consider technological change in the context of limited resources. The concern of weak sustainability is achieving sustained per capita consumption in a world with a growing human population. The view presupposes that human-made capital can effectively substitute for natural capital and the services provided by the ecological systems. It thus claims for the maintenance of the sum of human, human-made and natural capital in the endeavour of sustainable development (see Baker 2006:32-34; Hackett 2006:402-414). This shows that the weak theory of sustainable development could be regarded as a saving approach to sustainability (Gutes 1996). An economy is considered sustainable when its saving rate is greater than the combined depreciation of natural and human-made capital and, hence, sustainability is equivalent to non-decreasing total capital stock available for the production of goods and services (Gutes 1995:149; Pearce & Atkinson 1993:105). Economists contend that one generation leaves for the next generation not only natural and human-made capital, but also human and institutional capital in the form of knowledge and technology, which allows flexibility in replacing production inputs (Jaeger 1995). Economists believe that new technologies and better-educated population compensate for the depletion of natural resources. They then argue that individual preferences and expectations provide an appropriate guide towards sustained economic growth in the context of limited natural resources and ever-increasing human population (Hackett 2006:407).

Weak sustainable development aims to integrate the capitalist growth model with environmental concerns. Its advocators assert that the best way of dealing with the depletion of 'critical natural' capital is assigning an economic value or price to the resource in question; thereby the cost-benefit analysis determines its scarcity value in the course of economic development (Baker 2006:32; Hackett 2006:403). The cost-benefit analysis also helps to deal with the problem of environmental damage caused by resource use. For example, the cost-benefit analysis guides the transition from hydrocarbon energy stocks to renewable energy source, while adapting to the complications of global climate change induced by net oxidation of hydrocarbons during the transition (Barbiroli 2011). Weak sustainability thus holds a view that economic development is a precondition to environmental protection (Baker 2006:32-34). Methodologically, economists use the discounting[30] approach on the value of future consumption opportunities using a social discount rate, which is lower than the market discount rate, to ensure intergenerational welfare, measured in terms of per capita consumption or wealth (Barrett 1996; Jaeger 1995).

Economists acknowledge that the replication of the current standard of living by future generations will be constrained by contemporary resource use. The depletion of natural capital arising from contemporary resource use and destruction are regarded as externalities.[31] The mainstream economists' views on externalities have been heavily influenced by the theory of property rights. The pioneer work on the economic theory of property of rights by Coase (1960), which is often known as Coase theorem, states that externalities do not give rise to a misallocation of resources if there are no transaction costs, and that alienable property rights are well defined and enforceable (Hackett 2006:161). The Coase theorem is often criticized because of its naive assumption of a world without transaction costs. Externalities that arise because of overexploitation of renewable resources (eg biodiversity loss, land degradation) are often costly and difficult to negotiate, since they transcend national boundaries and generations (see Barrett 1996). The economic theory of property rights is congruent with the theory of weak sustainability (see sections 2.3.2, 2.4.3, and 2.4.4). The main policy prescription of the property rights paradigm to redress the interwoven problems of farmland degradation, low agricultural production and poverty in the developing world is ensuring well-defined and enforceable alienable property rights through land reform. The Coase theorem of property rights is thus meant to be a strategy for economic development and a guide to facilitate the best economic use of land in the nation.[32] Various economists have documented the role of property rights in land and other assets in the economic growth of the Western world since the eighteenth century. For example, Hernando de Soto's (2000) *The mystery of capital* focuses on how property rights help to unlock the hidden potential embedded in the

[30] Discounting is a method of reducing the monetary value of future benefit and cost streams using a selected discount or interest rate.
[31] Externalities refer to the costs and benefits that are not reflected in market demand and supply. That is, costs and benefits that accrue to companies or individuals that did not make production and consumption decisions.
[32] From an economic viewpoint, private property rights in land are normally seen as the more efficient institution to ensure sustainable land management practices. This is because of the occurrence of externalities in connection with open access and common property, and of the incentives which they create to sustainable resource extraction or/and conservation investment.

land and other assets to act as a capital. According to this economist, capitalism can be made to work for the poor by formalizing their property rights in land, houses, and small businesses (De Soto 2000:7-8). Indeed, such universal policy prescription presumes a static world, while societies and environments are 'coevolving systems' (Norgaard 1994:33). This study recognizes the political, social and economic dimensions of land tenure and its dynamism. Section 2.3 provides a brief discussion on the relationship between land reform and sustainable development.

Critics of weak sustainability (see Gutes 1996; Hackett 2006; McDonach & Yaneske 2002; Victor 1991) argue that the notion that human-made capital can effectively replace natural capital is not supported by strong empirical evidence. This is partly because the input natural capital entered in the neoclassical growth model aggregated critical and non-critical natural capital in the hypothesized production function. That is, the production function does not give special attention to 'critical' natural resources and their role as life-support services. Apart from scant empirical evidence of substitutability between human-made and natural capital, the waste-transforming capacity of the natural environment and the degree of biodiversity have no real substitutes. 'Human-made capital cannot replace a multitude of processes vital to human existence such as the ozone layer, photosynthesis or the water cycle' (Hopwood et al 2005:40). For instance, concern about agro-food and agro-industrial resources arises from excessive use of chemical fertilizers and pesticides (Barbiroli 2011:19) and, hence, the adverse effects of the Green Revolution[33] on environmental degradation. In addition, if one considers the waste-transforming capacity of natural capital, justifying a high degree of substitutability between human-made and natural capital would seem even harder. Indeed, in the neoclassical model of economic growth the environment-economy link is reduced to the function of providing inputs by the environment to the economy, which undermines the capacity of the environment to assimilate waste and to sustain development. In addition, the role of the biosphere as a depository of wastes is widely recognized as being beyond the control of the market system. Moreover, overexploitation of renewable natural resources cannot be internalized through technological change or cost-benefit analysis. As Barrett (1996:12) notes, 'If one ignores transaction costs, then alienable property rights hold appeal because they permit efficient unilateral action. But the transboundary and transgenerational nature of renewable natural resource degradation renders unilateral measures suboptimal.'

[33] 'Green Revolution' refers to the diffusion of agricultural technologies, particularly improved seed varieties, chemical fertilizers and pesticides to boost the yield of food grains.

The concept of strong sustainability

The concept of strong sustainability has a similarity to the conceptualization of conservation reflected in the World Conservation Strategy (WCS) of 1980. Conservation was defined in the WCS as 'the management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations' (IUCN 1980, paragraph 1.10, in Adams & Thomas 1993:592). The concept of strong sustainability is informed by ecological science (Hackett 2006:404), and could be regarded as an 'environmentalists view' of sustainable development (Jaeger 1995). Sustainability is viewed in terms of non-decreasing natural capital available across generations and defined as leaving a stock of critical natural capital for future generations that is not smaller than the one enjoyed by the present generation (Gutes 1995:151). The strong sustainability view is critical of the intrinsic value and irreversible life support systems of natural capital. This view is thus in line with the ecological systems approach[34] to substantiating its claim on maintenance of human, human-made and natural capital separately, thereby rejecting the substitutability of natural capital by human-made capital, in the course of sustainable development (see Baker 2006:32-34; Hackett 2006:402-414).

The notion of strong sustainability contends that environmental protection should be given greater priority over economic growth. Two major reasons are provided for the 'unsustainability' of a neoclassical model of economic growth that considers technological change in the context of limited resources. First, the exhaustion of natural capital on which economic production depends is unavoidable. Second, irreversibility of global scale environmental degradation such as species extinction, large-scale ecosystem disruption, and global climate change associated with the continuing increase in emissions of greenhouse gases (Beckerman 1992; Hackett 2006; Jaeger 1995). Accordingly, strong sustainability holds a view that environmental protection is a precondition for economic development (Baker 2006:32-34). In addition, strong sustainability does not favour a free market enterprise, but strong government intervention and active citizen participation in the endeavour of sustainable development. It thus seeks a world outlook shift to regard quality of life as an ultimate result

[34] The ecological systems approach views sustainability as a state in which human beings are low in numbers and economic development and live simply within the limits of a naturally renewing ecosystem. 'The state is supported by the input of energy from the Sun and is dominated by the presence of natural capital' (McDonach & Yaneske 2002:219).

of sustainable development rather than accumulation of quantitative material wealth. This led to the emergence of alternative indicators of GNP,[35] which comprises calculations for the depletion of natural capital, cost of pollution and social issues such as unemployment and inequality (Baker 2006:32-34; Hamilton & Clemens 1999; Victor 1991).

Critics of strong sustainability contend that statistics about the imminence of global resource scarcity often fail to anticipate the economic feedback mechanism induced by resource scarcity (Beckerman 1992; Jaeger 1995). There is 'a rise in the price of any resource that is becoming scarce', which leads to 'increased profitability of exploration, of improved processing technology and of increased research into substitutes' (Beckerman 1992:483). In addition, the rigid position of rejecting the substitutability of natural capital by human-made capital seems unethical with regard to intragenerational equity over resource use. For example, how could biodiversity be conserved for future generations at the expense of poverty experienced by the current generation? There is evidence (for example see Barbiroli 2011; Hackett 2006) that environmental conservation is achieved better in high-income countries than in low-income countries, although economic growth usually leads to environmental degradation in the early stages of industrialization.

To sum up, weak and strong views of sustainability both acknowledge the imminence of global resource scarcity and inevitability of critical capital exhaustion. Weak sustainability contends that exhaustible natural resources do not pose a limit to population and economic growth since human-made capital effectively replaces natural capital and the services provided by the ecological systems, whereas strong sustainability contends that human-made capital cannot effectively substitute for the vital services provided by ecological systems. In addition, both views focus on intergenerational equity. Weak sustainability defines sustainability in terms of non-declining consumption or wealth per capita ('standard of living') while strong sustainability regards a non-declining natural capital per capita ('quality of life'). In addition, both viewpoints stand for improved stewardship[36] of the natural resource base. The WCS noted that the view of conservation as irrelevant to or opposed to development is a

[35] Arrow et al's (2004:167) review of empirical literature on alternative indicators of GNP suggests that 'several nations are failing to meet a sustainability criterion, since their investments in human and manufactured capital are not sufficient to offset the depletion of natural capital'. The article also discloses that 'investment problems seem most acute in some of the poorest countries of the world' (Arrow et al 2004:167).

[36] Dictionary definitions of stewardship centre on 'the careful and responsible management of something entrusted to one's care', while the term is defined vaguely in popular ecology literature (Barrett 1996).

misconception. 'Conservation in fact aimed to avoid ecological damage and promote environmentally sound development' (Adams & Thomas 1993:392). The emergence of political ecology highlights the interwoven character of the discursive, material, social and cultural dimensions of human-environment relations (Escobar 1999:2). Moreover, explicitly transboundary disciplines such as ecological economics and political ecology, along with freedom-oriented development and deliberative democracy, could offer important means of understanding the local-global politics of sustainable development (Sneddon et al 2006). Despite these dichotomized theories of sustainability, the essence of diverse conceptualizations of sustainable development is desire for development to meet the essential needs of all people, especially the poor, as well as drawing attention to the constraints they face in exploiting natural resources if the survival of future generations is to be guaranteed. A more local and applied perspective is reflected in the 'conservation-based development' approach. This approach envisions programmes and projects that offer a sustainable livelihood for local communities by reconciling traditional and scientific knowledge about the economic, social and ecological dimensions of sustainable development (Hackett 2006:329). In view of this, sustainable livelihoods approaches (SLA) emerged to maintain the sustainability of natural resources for present and future generations by taking into account the needs of the poor in the development discourse (Thomson 2000). Section 3.2 of this thesis examines DFID's sustainable livelihood framework.

The next subsection provides a summary of development approaches that attempted to address problems of soil degradation and sustainable land use in the developing world. This consolidates the discussion on the inherent limitations of the neoliberal development theory in policy and strategic considerations of sustainable development and, in particular, in discussions of sustainable farmland use in the study area.

2.2.2 Approaches to soil degradation and sustainable use of farmlands

The development discourse has used three common approaches to deal with the problem of soil degradation[37] in the developing world (Beshah 2003:46). These are the classic (technical), populist and neoliberal approaches. The classic approach conveys that 'the extent of and

[37] Soil degradation is a temporary or permanent lowering of the productive capacity of land. It occurs because of several closely related processes, particularly erosion, chemical degradation (loss of nutrients through crop removal, erosion, leaching), physical deterioration (surface sealing, crusting) and biological degradation (decline of soil humus content) (Young 1989, in Elias 2002:2).

solutions to' soil degradation are well known, while the problem is to get people to implement them. The populist approach asserts that 'the nature and extent of' soil degradation are imperfectly understood, and local people resort to their own practices and adaptations on rational grounds. The neoliberal approach shares some of the views of the classic approach, and asserts that the nature and extent of soil degradation are well known, while incentive structures are crucial to motivate local people to implement remedial prescriptions. These days, approaches to sustainable use of farmlands 'are mostly guided by populist approach, with some elements of the neoliberal approach appearing in the process' (Beshah 2003:46).

The attractiveness of the populist approach lies in the recognition given to indigenous knowledge in the search for context-specific conservation technologies, as opposed to a universal prescription of technocratic approach. However, it is too simplistic since it does not indicate how to overcome the dominant pressures of technocratic approaches, which are derived from the dominant power structure of scientific knowledge that inculcates modernization values. The technocratic approach, on the one hand, has its own merit in mobilizing the supplementary global and national political will and resources to scale up contextually suitable conservation technologies. The attractiveness of the neoliberal approach, on the other hand, is its recognition of the impact of political, economic and social factors on a given farming practice and associated soil degradation, while it adheres to the Western (modernization) values of rationality, efficiency and individualism.

Despite this evolution of approaches, experience has shown that appropriate soil and water conservation technologies are not always adopted, even where the need is obvious (Barbier et al 1997:893). Farmers may reject or abandon many technologies that have been useful, and adopt others in their place, since they consider a variety of factors when adopting particular conservation technologies (Perrt & Stevens 2006; Van de Flier & Braun 2002). This highlights the need to better understand the conditions that encourage sustained adoption of conservation technologies to achieve a desirable progress towards sustainable land management practices in particular and sustainable development in general.

This study therefore views sustainable development as a dynamic process of creating sustainable economies that meet human needs equitably, without extracting resource inputs or expelling waste in excess of the environment's regenerative capacity, as well as establishing sustainable human institutions that assure security and opportunity for the rural poor. Such a conceptualization allows for a more structured discussion on, and analysis of, how to balance environmental concerns with economic and social processes in development interventions that deal with the problems of land degradation. The concept of strong sustainability emphasizes the need to maintain a functioning biosphere, without which human life, and possibly all life, would be extinguished. In contrast, the concept of weak sustainability emphasizes humankind's list of desires from socioeconomic activities. In the mainstream debate about sustainable development, the viewpoint of weak sustainability is the dominant attitude in the contemporary globe (Voinov & Smith 1994, in McDonach & Yaneske 2002:218). From the viewpoint of weak sustainability, land reform is considered an important policy intervention that ensures security and opportunity for the disadvantaged poor in the endeavour of sustainable development. In view of this, the next section briefly outlines the relationship between land reform and sustainable development.

2.3 Land reform and sustainable development

Economic development issues concerning land tenure are often related to the concept of 'land reform'. Many development specialists and planners believe that land reform is a prerequisite to the economic growth and wellbeing of people in developing agrarian countries. The term 'land reform' refers to a government measure undertaken to redistribute landholdings and this results in a change of agrarian structure (Bruce 1993:19). Platteau has indicated that land reform can involve radical land redistribution, land ceilings, transformation of tenants into owners and other measures (Platteau 2000:7). The purpose of land reform usually depends on the political inclination of the government that initiates it (Fleming 1975). For example, the goal of the South African government's land reform programme is to address the legacy of apartheid in land distribution and to create security of tenure and certainty in relation to rights in land for all South Africans (Department of Land Affairs 1996:3). Some land reform programmes seek to redistribute land and to adjust historical inequalities. Examples of this approach are the Ethiopian land reform and the repurchase of European lands in Kenya and Zimbabwe (Bruce 1993:23). On one extreme, land reform may lead to government acquisition of land to facilitate a socialist form of tenure; on the other, it may lead to individualization of tenure (Conning & Robinson 2007; Fleming 1975; Whittemore 1981). The processes may involve expropriation and breakup of large estates and their distribution among former tenants (Conning & Robinson 2007:417; Fleming 1975).

Historically, the dichotomy between socialist and liberal market orientations influenced theories of land reform. From a socialist point of view, Marxian theory was used to understand land reform as a class struggle between the proletariat and the capitalist landed gentry. This socialist orientation has underlined land reform of the developing nations of Asia and Latin America, where land was concentrated in the hands of a few landlords (Whittemore 1981). For governments with a socialist orientation, land reform constitutes state ownership of all lands, and a programme of collectivizing the land tenure system, as in Tanzania, Benin, Ethiopia and Mozambique (Okoth-Ogendo 1993). On the other hand, land reforms that are premised on the individualization of property rights have been theorized through the neoclassical theory of property rights. This is an attractive framework for governments that are inclined towards liberal market economies. Up to the late 1980s, the neoclassical property rights paradigm has been the driving force behind land reform in most sub-Saharan African countries (Barrows & Roth 1990; Okoth-Ogendo 1993; Place & Hazel 1993). During the 1990s, however, neoclassical property rights theory was questioned and reassessed with regard to tenure reform in sub-Saharan Africa. The majority of farmers in sub-Saharan Africa held their land under indigenous land tenure systems and the efficiency of these systems has been the concern of many scholars and development specialists. The socialist and liberal market orientations that informed land reform policies and programmes could both be regarded as a 'replacement paradigm' since they advocate the replacement of an indigenous land tenure system by statutory tenure provided by the state. In view of this, there are calls to abandon the 'replacement paradigm' in favour of an 'adaptation paradigm', which supports gradual changes of indigenous tenure systems (Bruce, Migot-Adholla & Atherton 1994:261).

Though there is a renewed interest in an adaptation paradigm, neoliberal thought is dominant in development thinking and practice. This development perspective virtually abolishes context-specific development intervention in favour of a universal set of prescriptions for developed and developing countries. These prescriptions are nothing more than the prerequisites for a capitalist economy and include a detailed description of institutions (eg property rights) that are deemed appropriate to ensuring sustainable development within the framework of the capitalist economic system (Bugri 2008; Feder & Nishio 1998; Wallace & Williamson 2006). In the discourse of sustainable development, developing countries are challenged by closely related and critical problems of low agricultural production, poverty and land degradation (Pender & Gebremedhin 2007:396; Perrt & Stevens 2006:461; Reardon & Vosti 1995:1495; Scherr 2000:480; Shiferaw & Holden 2000:218). Neoliberal development theory is influencing the land reform policies of the developing world towards uniformity in order to ameliorate these interwoven problems of underdevelopment (Bugri 2008; Place 2009).

The notion that a more secure land tenure system provides the necessary incentives for farmers to manage their land better and invest in conservation technologies induced many countries to launch land titling programmes[38] to redress the problems of low agricultural production, poverty and land degradation (Bugri 2008; Deininger et al 2011; Place 2009). Private property rights in land that are conceived within a market-oriented society have attractive tangible benefits to buttress land-related investment, women empowerment, improved governance and reduced conflict (Deininger et al 2008:1786-1787). These property rights are also regarded as fundamental human rights since they allow individuals to decide freely what to do with their assets (HDR 2001:9, in Beyene 2004:75). Accordingly, it is widely believed that the amount of land households own, the feeling of security they have in these holdings, and the process through which disputes are solved affect the households' income, their incentive to work and invest and their desire to implement sustainable farming practice by investing in conservation technologies (Binswanger & McIntire 1987:96; EEA 2002:3).

The effects of land tenure security, which accrues from land titling, on conservation investments have been studied in a number of developing countries. However, results show the mixed and inconclusive impact of perception of land tenure security on the likelihood of making certain types of investment that can help sustainable use of farmlands, such as tree planting, fallowing, terracing and manuring. Some empirical works (eg Besley 1995 in Ghana; Deininger et al 2011 in Ethiopia; Gavian & Fafchamps 1996 in Niger; Place & Otsuka 2001 in Malawi) show that stronger land rights and the presence of land titles are often associated with an increased likelihood of undertaking tree planting, terracing and manuring. However, these are far from universal, and there are often divergent effects on different types of investments within the same locality. Additionally, some of the results themselves, though statistically significant, would hardly qualify as important because of low marginal impact. To gain a sense of the diversity of results in the same locality, one can consider the surveys conducted in Ethiopia. On the one hand, it is reported that perception of tenure security has a strong positive effect on the practices of tree planting and terracing (Ayalew et al 2005; Deininger & Jin

[38] 'Land titling programme' refers to the formal procedures followed by a government to register the farm plots of individual farmers along with the provision of land possession certificates.

2006; Deininger et al 2011; Mekonnen 2009). On the other hand, adoption of conservation measures has been found not to be related to perceptions of tenure security (Amsalu & De Graaff 2007; Holden & Yohannes 2002; Shiferaw & Holden 1998). It is also reported that perception of tenure security has different effects on the adoption of stone terraces and soil bunds (Gebremedhin & Swinton 2001).

In addition, the empirical literature provides inconclusive results on the effects of perception of land tenure security on similar types of investment in a country. For example, Deininger, Ali and Yamano (2008) found that a greater number of transfer rights were associated with increased tree planting in Uganda. In contrast, a study conducted by Place and Otsuka (2002) reported that land rights and land acquisition mode did not have a significant effect on tree planting practice there. Obviously, the divergence of empirical results is dichotomized across space and time, as well as on various types of investments that are believed to have a strong impact on sustainable use of farmlands. Moreover, some recent studies affirm the existence of reverse causality and, hence, farmers may undertake conservation investments in order to enhance tenure security (Besley 1995; Brasselle et al 2002; Place & Otsuka 2002; Sjaastad & Bromley 1997). The implication of these studies disaffirms the 'mono-directionational relationship' (Neef 2001:125) often hypothesized between perception of land tenure security and conservation investment.

In the context of the developing world, empirical information on the factors that determine farmers' decisions on conservation investment is limited (Amsalu & De Graff 2007; Pender & Kerr 1998; Shiferaw & Holden 1998). Literature indicates that farmers rarely adopt the technical solutions offered by external agencies unless consideration is given to various socioeconomic, cultural and institutional factors, as well as biophysical and technical ones (Perrt & Stevens 2006; Shiferaw & Holden 2000; Van de Flier & Braun 2002). Indeed, there is no universal agreement on relevant factors and barriers, since there is a high degree of locational and technological specificity of soil and water conservation technologies (see Amsalu & De Graff 2007; Shiferaw & Holden 1998).

Overall, the literature depicts important messages about the inherent limitations of the neoliberal prescriptions to redress the interwoven problems of sustainable development in the developing world. To begin with, farmers may take into account not only economic incentives, but also a variety of other non-economic factors in order to practise and adopt sustainable land management practices (see sections 2.3.2 and 3.3). Second, while farmers' probability of adoption can be estimated from their expected utility maximization behaviour, mere reliance on universal utility function is questionable (Arrow, Dasgupta, Goulder, Daily, Ehrlich, ..., Walker 2004:150). This is because 'human beings are involved in many practices over time, which are connected to each other in a complex way' (Leeuwis & Van den Ban 2004:62).[39] Third, other non-tenurial factors that determine sustainable use of farmlands are present (Bugri 2008). This obscures the assertions that contend that a more secure tenure system provides the necessary incentives for farmers to manage their land better and invest in conservation technologies. Fourth, there is a great deal of variation in defining and measuring security of land tenure in the literature. The next subsection examines how the concept of land tenure security is defined and measured in the literature.

2.3.1 Defining and measuring land tenure security

Land tenure security is a complex concept that has spawned numerous terms and descriptions in the economics literature. [40] It varies along a continuum of rights. There is minimum security when the landholder has a temporary, not necessarily exclusive claim to the land and its produce, while his or her ability to make decisions is limited, and to make transfer decisions is nil (Brasselle et al 2002:380). On the contrary, maximum security is achieved when an individual has rights to a piece of land 'on a continuous basis, free from imposition or interference from outside sources, as well as ability to reap the benefits of labour and capital invested in that land, either in use or upon transfer to another holder' (Place, Roth & Hazell 1994: 19). Given this scenario, a two-period theoretical household model that presupposes the utility maximization behaviour of individuals is widely used in the economics literature to conceptualize security of land tenure. According to this model, the landholder's perception of tenure security occurs from the expectation that changes in rules over time will increase his or her utility or keep it intact, while insecurity arises from expectations that changes in rules over

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[39] Most of the empirical literature reviewed focuses on the constraints of adoption of conservation investment by farmers; and conditions that influence sustained use of these measures after adoption are scarcely investigated. We need to know the conditions that encourage sustained adoption of conservation investment to improve our understandings of the determinants of sustainable land management practices. Obviously, decision making on adoption and continued use of sustainable land management practices is generally a multistage process, though ideas varied about the precise number, nature and sequence of stages in which people progressed (see Leeuwis & Van den Ban 2004:130; Perrt & Stevens 2006:464).

[40] The term 'security of tenure' is widely used in the land tenure literature with regard to economic development. Owing to the emphasis given to the economic theory of property rights in the theoretical framework, the chapter focuses on empirical and theoretical literature of economics.

time will decrease the utility (Arnot, Luckert & Boxall 2011:297-300). Mainstream economists believe that landholders perceive maximum security of land tenure when landownership is registered and protected by a legal title. This is because of their belief in the basic assumption of rational behaviour of economic agents, which states that economic agents maximize their utility, given the information and risk constraints they face. A legally registered land title is thus assumed to provide unambiguous information at low cost, quickly and securely to an individual landholder in the course of pursuing his or her self-interest ('utility maximization'). This shows that transaction costs and asymmetry of information approaches are often used to analyse the effects of land tenure security accrued from a registered land title.

Despite this consensus of conceptualizing land tenure security, there is a great deal of variation in the literature in defining and measuring tenure security (Arnot et al 2011; Place 2009). To make sense of these variations, Arnot et al (2011) used Sjaastad and Bromley's (2000) conceptual model. The exegetical inquiry of Sjaastad and Bromley as to the exact meaning of clearly demarcated individual property rights in land asserts that the concept of tenure security encompasses both content and assurance aspects of land tenure security (Sjaastad & Bromley 2000). The content or substance aspects refer to the range of use and/or transfer rights possessed, while the assurance aspects refer to the extent of autonomy provided to the landholder in exercising these rights. They also contend that it is only the assurance of rights, and not the substance, that truly determines tenure security (Sjaastad & Bromley 2000). However, the literature frequently uses both content and assurance aspects of property rights in land to explain the economic behaviour of landholders (Arnot et al 2011).

Studies that focus on the content aspects define tenure security in terms such as 'duration and renewability of rights' (Brasselle et al 2002; Gavian & Fafchamps 1996) and 'rights to sell or transfer lands' (Gavian & Fafchamps 1996). Scholars who emphasise the content aspects of tenure security use measures or indicators associated with legal land title, range of use rights, experience of previous village-level land redistribution, and methods of acquisition in their empirical works. In contrast, definitions given to the concept by emphasizing the assurance aspects of property rights in land used terms such as 'uncertainty of rights' (Gavian & Fafchamps 1996), probability or perceived probability of losing all or part of rights held (Besley 1995; Holden & Yohannes 2002; Place & Otsuka 2000, 2001, 2002), and uncertainty about changes in government and its policies (Brasselle et al 2002). Scholars that emphasise the assurance aspects of tenure security use indicators related to the probability of eviction or expropriation (Sjaastad & Bromley 1997), probability of extension or renewal of property rights, and perception of good governance in their empirical works.

A synthesis of these conceptualizations and operationalizations of land tenure security is documented in the literature (see Arnot et al 2011:301-302). Additionally, 'the common use of two content measures of property rights as proxies for tenure security: legal title and duration of tenure' is disclosed in this recent literature (Arnot et al 2011:303). However, using such standalone phrases is not sufficient to explain tenure security because of varying methods of land access, levels of equality of land holdings, levels of individualization of rights, degrees of autonomy that traditional authorities hold, and types of and degrees of land conflict (Place 2009). In the African context, 'the practical impact of" establishing formal tenure systems for example has resulted in increased insecurity, since newly created legal rights failed to accommodate overlapping customary tenure arrangements and 'have created uncertainty' among local farmers (Baland, Gaspart, Platteau & Place 2007:289; see also Heltberg (2002) and Place (2009) for further synthesis of the empirical literature). EEA (2002) notes that policies of state ownership, coupled with the redistribution of land, engendered a considerable amount of tenure insecurity among smallholders in Ethiopia. Above all, whether a legal title is an adequate proxy to measure tenure security is a contentious area of debate in the literature. On the one hand, it is echoed that maximum tenure security can be afforded only when land is registered and protected by a legal title (eg Brasselle et al 2002; Deininger et al 2011). On the other hand, it is claimed that legality of tenure is not necessarily a precondition for security of tenure (eg Feder & Onchan 1987; Place & Otsuka 2000; Razzaz 1993). This dichotomized viewpoint could be dealt with if one realized that 'the security of a right is not the perception of a single likelihood, but rather a locus of perceived likelihoods and associated changes in net benefits' (Sjaastad & Bromley 2000:372).

Overall, investigators of social and economic aspects of land tenure have used the term 'security of tenure' in three distinct ways that require clarification. Security of tenure is often used with reference to the certainty, duration and full rights or robustness of land rights (Place et al 1994: 19). When used with reference to certainty, security of tenure refers to the landholder's protection of rights or security of possession and non-interference by the state and private entities for a specified period, which may be long or short. The second usage of security of tenure includes certainty and long duration of tenure. In this case, the certainty and long duration are related to incentives of land-related investment. The third usage of security of tenure is the requirement of full rights in land or robustness of rights and refers to full private ownership land rights. Accordingly, this study measured land tenure security based on farmers' perceptions of their security of tenure based on the second usage of the concept. Land tenure security is operationally defined as study respondents' perceptions of their certainty of land possession and assurance of long duration accorded by land certificate for the adoption of conservation investment and sustainable use of farmlands. Alternative measures were adapted in this study to examine study respondents' perceptions of tenure security, and to arrive at a composite index that summarizes the content and assurance aspects of land tenure security (see section 7.2).

The effects of secure property rights in land (land tenure security) for improved productivity and sustainable land management practices are contested by many economists. In view of this, the next subsection examines the economic theory of property rights.

2.3.2 Economic theory of property rights

Neoclassical economic theory presupposes that the expected utility of resource consumption, extraction or habituation is influenced by the initial status of the resource and the institutional setup that governs access to and use of that resource (Arnot et al 2011). Analogically, the theory contends that clearly demarcated property rights in land or tenure security help to unlock the hidden potential embedded in farmlands to ensure their sustainable use and management. A two-period household model,[41] which attempts to explain the economic behaviour of landholders, is often used in the economics literature to show the effects of land tenure security on sustainable use of farmlands.

A central argument put forward by many economists in defence of fully fledged private property rights to land is that such rights enhance investment incentives (De Soto 2000; Demsetz 1967; Feder & Nishio 1998; Feder, Onchan & Chalamwong 1988). This notion is emphasized by those who advocate the necessity of establishing freehold titles to land in order to stimulate agricultural growth in developing countries, especially in sub-Saharan Africa (eg

[41] Economists often use a two-period theoretical household model to measure and compare the utility maximization behaviour of individuals in two periods, between a period in which landholders perceive security of land tenure and one in which landholders perceive insecurity of land tenure. According to this model, landholder's perception of tenure security occurs from the expectations that changes in rules over time will increase or keep intact his or her utility while insecurity arises from expectations that changes in rules over time will decrease his or her utility

Ayalew et al 2005; Barrows & Roth 1990; Deininger & Jin 2006; Deininger et al 2011; EEA 2002; Feder & Noronha 1987). In simple terms, the economic theory of property rights contends that clearly demarcated private property rights in land help to enhance farmers' capability of and motivation to undertake the required conservation investment to avoid the depletion of soil nutrients. According to Hackett (2006:116), the technical feasibility of conserving soil nutrients in subsistence agriculture in which individual farmers hold fragmented plots is quite doubtful. The success of soil conservation depends largely upon an integrated investment of upstream and downstream plot holders on conservation technologies.

The role of land tenure security or clearly demarcated property rights in land in reducing information and transaction costs is a cornerstone of the theoretical frameworks developed by economists.[42] Explaining the relationship between security of landownership and farm productivity, Feder et al (1988) indicate two key linkages[43] that connect land titling to economic performance. The first linkage, which is land tenure security and investment incentives, is a fundamental one that underlies private property rights on land. In view of this, land titling has an important implication in reducing the economic costs of litigation over land disputes, credit market transactions, and land market transactions, thereby buttressing both the demand and supply side effects of land-related investment (Barrows & Roth 1990; Deininger et al 2011; EEA 2002; Feder & Noronha 1987). Much of the empirical literature has used Besley's mathematical model to analyse the investment enhancing effects of land titling. Besley (1995:908-912) identified three theoretical arguments to explain the links between land titling and investment incentives that have an indirect positive impact on sustainable land use: by reducing the risk of expropriation ('assurance effect'); by increasing farmers' access to institutional loan ('collateralization effect'); and by facilitating efficiency enhancing land transactions ('gains from trade'). Byamugisha (1999:2) emphasized that what is notable about 'land registration studies is that they have been focused on one sector, either rural (agricultural) or urban. Land registration impacts that accrue across sectors and those that affect the economy as a whole have been unaccounted for.' After noting this major weakness of earlier works, Byamugisha (1999) developed a comprehensive theoretical framework to

[42] 'Economic agents, it is assumed, endeavour to minimize the sum of transaction costs and production costs by choosing the appropriate contract, rules or system of property rights. In so far as transaction costs are significant, they are liable to influence the institutional set-up within which economic agents operate' (Platteau 1992:24, in Byamugisha 1999:5).

[43] Feder et al (1988) indicate two key linkages that connect land titling to economic performance. The first is land tenure security and investment incentives. The second is land title, collateral and credit.

guide empirical analysis on the effects of land titling to financial development and economic growth. The conceptual framework developed by Byamugisha (1999:6-11) that links land titling to financial development and economic growth has the following five important linkages:

1. Land tenure security and investment incentives linkage
2. Land title, collateral and credit linkage
3. Land liquidity, deposit mobilization and investment linkage
4. Land markets, transactions and efficiency linkage
5. Labour mobility and efficiency linkage

The first linkage is considered fundamental as it underlines the assurance effect of formally registered land titles. Land registration reduces the risk of expropriation and 'gives exclusive use and enjoyment of the stream of benefits accruing' from land-related investment in agricultural and non-agricultural activities. The investment incentive of tenure security leads to increased national investment and economic growth as land is a vital factor of production in every economy (Byamugisha 1999:8).

The second linkage explains three important effects of registered land title that have a collateral value. First, formally registered land title that has a collateral value improves farmers' access to more and cheaper credit, which could allow them to have sufficient resources for land-related investment. Second, the effect of collateral on investment and productivity is extended to all sectors in the economy. Third, the collateral effect also enhances the development of financial intermediaries by expanding market for the loan and reducing loan default rate associated with incentives of moral hazard and adverse selection (Byamugisha 1999:8-10). Obviously, land is regarded as a highly suitable collateral asset with a number of desirable characteristics, such as its immobility, fewer incidences of its permanent damage and requiring less maintenance (Binswanger & Rosenzweig 1986; De Soto 2000).

The third linkage asserts that land documentation facilitates all transactions concerning land (by selling, leasing, bartering, pledging or mortgaging) and makes them easier, secure and cheaper. This easy conversion of land to liquid assets and mobilization of wealth embedded in land significantly boosts financial development, aggregate investment and economic growth. Securely and efficiently transferable property rights in land avail the title-holder of a wide spectrum of investment choices ranging from direct investment to a portfolio of diverse assets.

Consequently, the resources embedded in land flow fairly freely away and back into the land directly through investment or indirectly through financial intermediaries (Byamugisha 1999:10).

The fourth linkage expands this convenience in land acquisition to portray efficiency gains on the type of investment planned and allocation of land. Land registration reduces the transaction costs among contracting parties by providing unambiguous information at low cost, quickly and securely, which in turn raise the efficiency of any planned investment. The allocation efficiency results from the possession shift of land from less efficient to more efficient users, which might be among individuals within a sector or between various sectors in the economy, helping to raise the productivity of land and its contribution to economic growth (Byamugisha 1999:10-11). This favourable land transaction facilitates, in the fifth linkage, the movement of labour from areas and sectors of low productivity to raise overall labour productivity, efficiency of investment and economic growth. The landowner can easily lease part or all of his or her land to move from agriculture in search of better opportunities elsewhere. The owner would not be worried about losing ownership right as he or she is guaranteed by the land registry. Additionally, the owner would easily find a tenant since land registration improves rental market and efficiency enhancing land transfers. Alternatively, the landowner could easily sell or buy land whenever he or she wished because of the existence of efficient land markets created by land titling (Byamugisha 1999:11).

Cognizant of these philosophical underpinnings, state ownership of land is highly contested as an important hurdle for sustainable use and management of farmlands in Ethiopia, where this research is conducted. It is argued that the current land certification programme, which deprives farmers of selling and mortgaging rights in their holdings, confined the investment enhancing effects of land certification to the first linkage. Obviously, the remaining four linkages discussed by Byamugisha (1999) have an important implication for sustainable farming practices. This conceptual framework also provides two additional emphases on the role of land selling and on mortgaging rights in contrast to Feder et al (1988) and Besley (1995). First, the impact of collateral on investment and productivity is extended to cover the whole economy. Second, the role of collateral to the development of the financial sector, by expanding the market for loans and by reducing financial intermediation costs, is recognized in the framework. Indeed, the analysis of this study draws on the first linkage (land tenure security and investment incentives linkage) because land selling and mortgaging are prohibited by law in Ethiopia. The effect of the Ethiopian land registration and certification scheme is thus limited to the arguments of the assurance effect. Accordingly, the analysis of this study draws on the security argument (assurance effect) omitting the collateral, gains from trade and productive efficiency arguments that relate to land selling and mortgaging.

Broadly speaking, the economic theory of property rights presupposes two fundamental effects of land titling on sustainable use of farmlands: 'investment enhancing' effects and 'labour migration' effects that help to reduce the pressure of ecosystem damage (see Bugri (2008:273) for detailed explanation). Based on the conceptual frameworks developed by economists, it is conventionally believed that land titling enhances land-attached investment by providing the required incentives (assurance effect) and resources (access to institutional credit) for farmers. Conservation investment in the form of building and stabilizing terraces, crop rotation, fallowing, tree planting, inter- (mixed) cropping and application of manure is believed to have a vital role in retaining soil fertility on a sustainable basis (EEA 2002:75). Access to institutional credit also helps to reduce ecosystem damage by diversifying subsistence farmers' livelihoods towards off-farm activities. Moreover, land titling facilitates movement of farmers towards urban areas in search of better livelihood opportunities rather than sticking to subsistence agriculture in environmentally fragile areas.

The hypothesized positive impact of land tenure security that is expected to accrue from land titling on sustainable farming practices is seldom supported by empirical studies of Africa. For example, the first major comparative study conducted by Place and Hazell (1993), which analysed the investment impacts of land tenure security across three African countries, did not find evidence of sustainable farming practice on parcels with higher tenure security. Nor did they find evidence of productivity difference across bundles of land rights held in Ghana, Kenya, and Rwanda. They then concluded that lack of access to credit, insufficient human capital, and labour shortages adversely affect investment decisions more than insecurity of tenure. In addition, the credit effects of land titling are often limited to larger farm-owners rather than subsistence farmers. It is reported that the collateral effect works for those farmers that have bankable projects and are willing to take the associated risks (Carter & Olinto 2003). Moreover, there is a dearth of comprehensive research that claims that the private tenure system is more advantageous than other tenure arrangements in motivating farmers towards sustainable land management practices. 'There has not been use of large area datasets to test hypotheses across different tenure systems and farming systems, or use of panel data sets to tease out dynamic relationships among the endogenous tenure, investment, and productivity variables' (Place 2009:1331). The impact of land titling in reducing land disputes and the effects of land disputes on investment and productivity variables have not been sufficiently tested (Heltberg 2002; Place 2009).

The ambiguities of the literature have led some observers to conclude that interventions to improve tenure security may be misguided or of little empirical relevance. Heltberg (2002:206) notes three sets of reasons for the empirical evidence that do not support the positive impacts of land titling on conservation investment in the context of Africa. First, communal ownership may give more adequate security of tenure than land titling in Africa.[44] Second, distortions in the implementation process of land titling programmes may lead to increased conflict and insecurity of tenure. Third, African agriculture is facing other more urgent constraints than land rights. These include access to or adequate use of agricultural inputs such as fertilizers and improved seeds and presence of roads to transport agricultural inputs and outputs. Accordingly, many more factors are influencing investment decisions than just security of tenure, and many factors affect perceptions of security of tenure in the African context (Meinzen-Dick et al 2002, in Bugri 2008:272). The economic theory of property rights excludes useful information of several variables that mediate conservation investment in a given farming system. For example, Holden and Yohannes (2002) concluded that resource poverty in land, livestock and basic education, rather than tenure insecurity, might undermine investment in tree planting and the purchase of farm inputs in southern Ethiopia. In contrast, Gebremedhin and Swinton (2003) found that farmers' perceived tenure security (arising from land certification) in northern Ethiopia was significantly and positively associated with long-term durable soil conservation investments, but not with the degree of investment, whereas Ayalew et al (2005) found that perceived transfer rights, rather than a short-term threat of expropriation, had a statistically significant impact on long-term investment in Ethiopia.

The mixed and inclusive empirical evidence mentioned above strongly suggests that context is important in conditioning the effects of land tenure security (Gagliardi 2008; Smith 2004). Nor is there an agreed way of measuring security of tenure, and results may be related to choice of proxy (Arnot et al 2011; Besley 1995; Brasselle et al 2002; Bugri 2008; Place 2009).

[44] The enduring strength of customary tenure, and the practice of ensuring claims to land through systems of social, political and kin networks and negotiations have meant that formal records and title play an insignificant role either in access to land or dispute settlement in the African context (Sara Berry 1993, in Rahmato 2009).

Indicators used to measure the content and assurance aspects of land tenure security have divergent effects on farmers' adoption of conservation technologies (see section 2.3.1). Equally, land tenure security arising from a bundle of use rights and transfer rights has divergent effects on an individual farmer's utility maximization behaviour thus his or her motivations towards adoption of conservation technologies. However, the economic theory of property rights cannot be totally dismissed, because the body of empirical research reviewed has confessed its methodological shortcomings. The logistic regression models[45] used in the economic literature comprise aspects of explained variation (predictable attributes) and unexplained variation (error terms) (see Arnot et al 2011:298-299). The property rights theory also assumes that investment decisions are made primarily in rational technical and economic considerations of individual farmers (for example see Besley 1995; Feder et al 1988; Feder & Noronha 1987).

Nonetheless, an individual farmer's decision on conservation investment would be mediated by several interwoven factors of the social world (Leeuwis & Van den Ban 2004; Van de Flier & Braun 2002). Some (for example see Fitzpatrick 2006; Heltberg 2002; Ostrom 1990; Schlager & Ostrom 1992) contend that communal ownership of property rights, when they are governed by locally devised and maintained rule structures, are better than private property rights for sustainable management of natural resources. Ostrom (1990) challenged the tragedy of the commons argument along with other two models[46] that are frequently used as the foundation for recommending state or market solution for sustainable management of natural resources. She argues that neither the state nor the market is uniformly helpful in sustaining the long-term productive use of natural resources. Her book entitled *Governing the commons* asserts that the problem of natural resource degradation is sometimes solved by voluntary indigenous organizations (communal property rights regime) rather than by a coercive state or private property rights regime (Ostrom 1990).

Equally, the World Bank Land Policy Reform Paper of 1975 evolved to a certain extent in recognition of modest efficiency losses associated with communal tenure systems (see

[45] The logistic regression model is often used to estimate a utility maximization problem where the farmer is assumed to have preferences defined over a set of policy alternatives; $U_j=b_jX_i + e_j$, Where U_j is the utility of policy j, X_i a vector of attributes of the plot and the farm, b_j a parameter to be estimated and e_j the disturbance or error term. The disturbance terms are assumed to be independently and identically distributed.

[46] The other two models are 'The prisoner's dilemma game' and 'The logic of collective action' (see Ostrom 1990:2-18).

Deininger & Binswanger 1999). The land policy paper was based on three basic principles that ought to be considered in informing any land policy: i) owner-operated family farms are efficient and desirable; ii) there should be freely operating land markets to permit land transfers to more efficient and productive users; and iii) more equitable distribution of assets is necessary. The World Bank still believes that these principles are largely valid. However, learning from experiences of various countries that subsequently implemented land reforms, a number of amendments were made to this position, including a recognition, under certain circumstances, that communal tenure could be a more cost-effective mechanism for land allocation compared with formal titling. In addition, formal titling, when desirable, should be evaluated in terms of its potential efficiency benefits and its implications to equity. Accordingly, the review of the empirical literature by Deininger and Binswanger (1999) discloses two important points in contrast to the uniform policy discourse perpetuated by the economic theory of property rights. They noted, first, that land titling is not always the best policy option. Second, the equity concerns regarding land market liberalization were often misguided, and that removal of barriers on land rental markets was of high priority in the context of the developing world (Deininger & Binswanger 1999:249).

Finally, selecting indicators of sustainable land use is essentially a political process that requires reconciliation of 'insiders' and 'outsiders' perspectives on the contextual priorities (Fernandes & Woodhouse 2008). The discourse on development shows how Western worldviews have shaped the understanding and practice of development. Much of the mainstream debate about sustainable development has ignored culturally specific definitions of what is sustainable in favour of the rather exclusive system of knowledge preferred by the dominant science paradigm (Norgaard 1994; Redclift 2006; Vilei 2011). Likewise, the neoliberal development perspective is influencing land reform policies of the developing countries towards uniformity to ameliorate the interwoven problems of low agricultural production, poverty and land degradation prevailing in these countries (Bugri 2008; Place 2009). This development perspective is based on a Western worldview of individualism, rationalism, competitiveness, profit maximization and technology transfer. The effectiveness of this development perspective, however, is being questioned because of its inability to address contemporary problems of poverty, social unrest and environmental crises. A strong ethical case for land reform as a component of sustainable development can be constructed by appealing to principles of justice, equity and the obligations that we have towards fellow humans, as well as the environment (see Attfield, Hattingh & Matshanaphala 2004; Barrett 1996).

Given the diversity in conceptualizing 'adoption' and 'continued use' of soil and water conservation technologies, as well as diversity of conservation technologies and proxy variables used in empirical works, the economic theory of property rights alone does not help us to understand the determinants of farmers' decision on sustainable land management practices. Empirical works pointed out that factors influencing the adoption and continued use of conservation technologies are different (eg Amsalu & De Graff 2007; Marenya & Barrett 2007). The farming system model[47] asserts that an individual farmer's decision on conservation investment is shaped not only by a single perception of tenure security, but also by a careful balance of numerous considerations and tradeoffs of the social world (see Leeuwis & Van den Ban 2004:67-71). Reardon and Vosti (1995) grouped the determinants of conservation investment under three categories. They contend that, broadly speaking, conservation investment is determined by i) incentives specific to the household, ii) specific capacity of households to invest in conservation technologies, and iii) 'external conditioning variables' common to households in a particular agro climatic/policy context (Reardon & Vosti 1995:1501-1502). In view of this, the next chapter examines the farming system model and the sustainable livelihoods framework to consolidate the theoretical and analytical foundations considered in this thesis. Sections 3.2 and 3.3 examine DFID's (2001) sustainable livelihood framework and the farming system model of Leeuwis and Van den Ban (2004), respectively.

After a critical analysis of the various conceptualizations of sustainable development, this study is informed by the thinking of Viederman and reflects his definition (Viederman 1996:46, in Hackett 2006:329):

> Sustainability is a community's control and prudent use of all forms of capital – nature's capital, human capital, human created capital, social capital, and cultural capital – to ensure, to the degree possible, that present and future generations can attain a high degree of economic security and achieve democracy while maintaining the integrity of the ecological systems upon which all life and production depends.

[47] The model conceptualizes a farming system as a natural resource management system operated by a farm household, along with the engagement of household members in other socioeconomic activities, to ensure their physical survival as well as their social and economic wellbeing.

The researcher favoured this definition for three reasons. First, it focuses on five important capitals that are more or less consistent with the livelihood assets implied by the sustainable livelihoods framework (SLF). Four of the five livelihood assets discussed in section 3.2.2 below are underlined in this definition in the form of capital. The conceptualization of human created capital in Viederman's definition is synonymous with the concept of physical capital in the SLF. However, the SLF omits cultural capital, but adds financial capital as a fifth form of asset. This might be because of the difficulty of grasping and quantifying cultural capital within a universal analytical framework. In contrast, the researcher is in line with the view that cultural capital provides a good framework for culture-specific or context-specific knowledge about how people view the world and their role in it (Hackett 2006:331). Second, Viederman's definition focuses on community rather than on the rational utility maximization behaviour of individuals conceived by the property rights theory. The economic theory of property rights rests upon a world outlook that presupposes that all values, rights and duties originated in individuals instead of a society at large. Third, there is an overlap between this working definition and the conceptualization of sustainable land management considered in this study.

In this study, the following conceptualization of sustainable land management is used: 'a system of technologies and/or planning that aims to integrate ecological with socioeconomic and political principles in the management of land for agricultural and other purposes to achieve intragenerational and intergenerational equity' (Hurni 2000:85). However, universal indicators of sustainable land management practices are not implied by this definition (see Fernandes & Woodhouse 2008; Vilei 2011). Accordingly, the research considered the views of study respondents to measure the concept 'sustainable use of farmlands' using local indicators. These indicators, which comprise attributes associated with 'ecological sustainability' and 'socioeconomic' sustainability, were developed by reconciling the perspectives of study respondents and knowledge acquired from the literature (see section 7.3). Ecological sustainability implies that farmlands are used in a manner of maintaining production (output) levels for current and future generations. Since farmlands are regarded as renewable natural resources, their utilization should equal the regenerative rates to satisfy the conditions of ecological sustainability. The proxy indicator used to measure ecological sustainability is the pattern of crop yield obtained from a particular farmland over years. The socioeconomic sustainability implies that an ecological sustainability of farmlands, through conservation investment, could continue by smallholders, given their agro-ecological and socioeconomic diversity. The proxy indicator to socioeconomic sustainability is the pattern of adoption or rejection of conservation technologies over years in each of the case study villages (rural *kebeles*).

Section 2.4 examines contemporary debates associated with sustainable land management, given the diverse conceptualizations of sustainable development and development approaches that aim to redress the problem of land degradation discussed thus far.

2.4 Debates of sustainable land management

In the 1990s, perception of causes of and remedial solutions for soil degradation in particular and land degradation in general were widely held by the classic and neoliberal approaches. Both approaches contend that the causes and remedies of soil degradation are universal. However, this perspective faced several challenges based on populist arguments that contend that soil degradation cannot be defined and measured unequivocally; nor can it be taken to be a straightforward ecological process (Beshah 2003:46; Van de Flier & Braun 2002). The complexity of soil degradation thus left room to uncover the dynamic interplay among the three essential pillars[48] of sustainable development emphasized by the Brundtland model. It also underlines the challenges of 'disciplinary and methodological heterogeneity', which demands the involvement of environmental and social sciences and methods, when specifying the relationship between soil erosion and decline in productivity, as well as soil conservation and increases in productivity (Fernandes & Woodhouse 2008:243). This suggests that the perspectives of stakeholders should be considered in implementing development interventions that intend to achieve sustainable land management (Hurni 2000; Vilei 2011). This view is consistent with the social learning perspective, which asserts that the 'cognitive system' of an individual farmer is mediated in a collective environment where there is adequate room for negotiation (see section 3.3.2).

Moreover, the interaction between population growth, land degradation and agricultural intensification are most controversial issues of the developing world within the theoretical framework of sustainable development. In the sections that follow, the prominent schools of

[48] According to WECD (1987), sustainable development is a balancing act between economic growth, social equity and environmental integrity, involving the intersection of these three dimensions, with the whole system embedded in a wider context of co-existence with other creatures.

thoughts in this debate are discussed in terms of four theoretical models and arguments. These are the classical school, neo-Malthusian view, Boserup's model and the neoclassical model.

2.4.1 The classical school

The basic argument of the classical school of thought informed Thomas Malthus's thesis on population and environment. Hackett (2006:115) comments on Malthus's thesis:

> Thomas Malthus, in his book *An Essay on the Principle of Population* (1798), argued that growth in human population would outstrip the natural resource endowment of the planet. Malthus's arguments were originally focused on the land resource and food production.

This pessimistic view subscribes to the notion that increasing population growth results in a parallel increase in demand for food. Malthus asserts that the geometrically increasing demand for food can be met by bringing new land under cultivation or by intensifying agricultural production on existing arable lands. However, cultivation of additional land (extensive cultivation) has limited prospects of overcoming the effects of population pressure as the marginal product of labour is bound to decline. The assumption is that marginal lands would have lower soil fertility than land already under cultivation. Intensifying agricultural production on already cultivated land is also subject to the law of diminishing returns. Consequently, there are decreasing returns to labour with fixed land endowments that would result in 'positive' and 'preventive' control on population. Events of higher mortality rates because of famine, disease and war are regarded by Malthus as a 'positive' check on human population, which establishes the limit to population growth through disproportionate death rates. The phenomena of delayed marriage because of lower wage rate that would ultimately limit fertility rates is also referred to as 'preventive' check in Malthus's theory (see Hackett 2006:115, 366, 369-370).

The implication of Malthus's theory is that any development intervention for poverty alleviation and conflict resolution is neither necessary nor desirable. Malthus even opposed charity towards the poor in order to jeopardize their reproduction. His writings led to the revision of the English poor laws, since opinion leaders and policy makers were persuaded by the statement that the poor are themselves responsible for their poverty (see Agrawal & Lal 1993). Lee (2003) argues that the phenomenon of preindustrial Europe supports Malthus's theory. He notes that an increase in real wages tended to be associated with mortality-related labour force reductions. However, Sen (1999) states that there is significant evidence of declining fertility rates that are linked to social and economic development in the modern era.

Overall, there is not sufficient empirical evidence to support the Malthusian prediction, and the model is criticized for two important reasons. First, it did not anticipate the dynamic relationships between population growth rates and stages of the industrialization process articulated by the theory of demographic transition. Second, Malthus failed to anticipate the possibility of impressive technological advances, such as the Green Revolution, which helped to bring about rapid progress in agricultural productivity (Hackett 2006:369). Thus, the validity of his assumptions about the growth rate of the human population (assumed to demonstrate a pattern of geometric growth rate) and the growth rate of food production (assumed to have a pattern of arithmetic growth rate) are questionable in the contemporary globe.

2.4.2 Neo-Malthusian view

The neo-Malthusian view of the nexus between population growth and land degradation has remained popular among conventional economists and major donors. This view contends that the Malthusian argument included an overall statement about the relationship between the natural environment, human population growth, and quality of life (Hackett 2006:115). They share Malthus's assertion that, 'an inferior mode of living is a cause as well a consequence of poverty' (in Agrawal & Lal 1993:12). They also hold a similar view to Malthus regarding the solutions to poverty alleviation and, hence, the remedy lies in the control of population. This control is triggered by natural factors such as epidemics, famine and delayed marriage in Malthus's assertion, while the neo-Malthusians goes to the extent of prescribing scientific contraceptives to countercheck the reproduction of human beings. They also supplement the contentions of Malthus on food production and land resources, by considering other demands (needs) of human beings induced by population growth.

The neo-Malthusian view asserts that population growth increases the demand for goods and services that cause ecological destruction. Unabated population growth exerts additional direct pressure on natural capital, especially in densely populated areas of developing countries, because of the growing need for employment and livelihoods (World Bank 1992). This view is articulated explicitly in the Brundtland Commission publication, which recommends population growth reduction as a vital means to achieve sustainable development in the developing world (WCED 1987). In addition, more people produce more waste, threatening local health conditions and implying stress on the earth's assimilative capacity. Moreover, this perspective underscores that the poor are both victims and agents of environmental damage (see Aggarwal 2006; Sneddon et al 2006).

The neo-Malthusian perspective underscores the inverted U-shaped relationship that presupposes trade-offs between economic development and environmental degradation. In addition, this perspective presupposes that poverty is both a cause and an effect of environmental degradation. Though the very poor are usually engaged in unsustainable farming practices by expanding subsistence farming to ecologically fragile areas, multinational corporations and wealthier farmers have caused disproportionate ecological damage through agricultural expansion and intensification. This plays a prominent role in various types of environmental degradation evidenced by species loss and depletion of natural vegetation (Scherr 2000). In addition, empirical literature documents that poor farmers are willing to adopt conservation technologies that demonstrate technical and economic viability, though farmers' evaluative frames of reference vary across space and time (Marenya & Barrett 2007). This implies that an expansion of contextually suitable and viable conservation technologies has a double-pronged effect in achieving poverty reduction and environmental protection objectives.

Nevertheless, the neo-Malthusian perspective poses controversial policy and research agendas in the contemporary globe. It emphasizes that humanity is the cause of all problems of the global ecosystem, since the current global population is beyond the carrying capacity of the planet. It thus favours forced sterilization, compulsory abortion, birth licensing and infanticide to downsize the current world population towards its optimum size (Baker 2006). The core of the neo-Malthusian narrative of the nexus can be presented using Hoben's (1995) synoptic review based on the Ethiopian experience. Hoben argues that in earlier years when there were fewer people in Ethiopia, indigenous farming systems and technology enabled them to make a living without seriously depleting their natural resources. Over the present century, both human and animal populations have grown, causing ever-increasing and perhaps irreversible environmental damage. Indigenous farming systems and technology have not been compatible with the sustainable use of natural resources since human and animal populations have exceeded carrying capacity. Nor are local farmers capable of sustainable use and management of natural resources because they are too poor to forego the present for future income or to provide for their children.

The subsequent two subsections examine the optimistic perspectives of sustainable land management debate based on Boserup's model of agricultural intensification and neoclassical growth theory. Both emphasize the role of technological progress and back up the concept of weak sustainability.

2.4.3 Boserup's model

The most optimistic view reflected by Boserup's thesis turns upside down the classical growth theory that informed that of Malthus (see section 2.4.1 above). The classical growth theory asserts that the key factor to economic growth is capital accumulation, which makes possible to a society machines, tools and equipment that raise output. These machines and tools are considered complements, rather than replacements of labour to expand agricultural production on the poor-quality (marginal) lands the society is forced to cultivate because of population pressure. Accordingly, the corresponding diminishing marginal returns of labour on fixed capital resources, because of population growth, restrain the progress of agricultural development, which always remains at subsistence level (Thirlwall 2003:339-346).

Boserup (1965) analyses the problem of agrarian development from a different perspective (cited in Binswanger & McIntire 1987; Kabubo-Mariara 2007; Pender & Gebremedhin 2007:406; Otsuka, Suyanto, Sonobe, & Tomich 2001:85). She demonstrates that population growth[49] is an autonomous determinant of steady intensification in agriculture, which brings the required institutional and economic changes in agricultural progress. Her line of argument is postulated by depicting the effects of population growth in both short-term and long-term scenarios. An increase in population density initially results in expanding the area under cultivation or shortening the fallow period when extensive cultivation is not feasible. Shortening the fallow period in turn leads to a decline in soil fertility in a short-term scenario. However, in the long term, higher population reduces the costs of labour to undertake the required investment for intensified and sustainable use of existing farmlands. Eventually, the aggregate production function of rational farmers always shift upwards in response to

[49] She often speaks of population 'increase', 'growth' or 'change', with the accent on the positive, rather than population 'pressure' which suggests a problem with harmful impact (Rahmato 2009:19).

population pressure in order to maintain the required output per capita. The shift variable in agricultural technology arises from changes in farming practices (eg increased application of manure, higher frequency of weeding), in the choice of farm tools (eg switch from the use of hoe to plough culture) and in the system of land use (progressive reduction in the fallow period). According to Boserup model, population growth ultimately plays an important role in replacing fixed capital resources, and bringing about the required technological progress of the agricultural sector.

Moreover, her model is the basis for evolutionary theory of land rights that asserts that population growth induces land scarcity and therefore private property rights in land tend to emerge (see Binswanger & McIntire 1987; Binswanger et al 1993; Platteau 1996). The evolutionary theory of land rights presupposes that the formalization of land rights is an inevitable outcome of growing land scarcity and market integration. The theory is the dominant frame of analysis among conventional economists to assess the effects of land tenure security on land-related investment. Its central tenet is that the emergence of private property rights in land, which occurs because of the joint impact of increasing population pressure and market integration, raises the expected returns of conservation investment (Besley 1995). In view of this, some scholars hypothesized that population density positively affects conservation investment, consistent with Boserupian theory and evolutionary theory of land rights (see eg Kabubo-Mariara 2007; Pender & Gebremedhin 2007; Otsuka et al 2001:85).

Tiffen and Mortimore (1994) reported on a study in Africa that backs up Boserupian theory in Africa. The paper demonstrates non-mathematical empirical evidence that shows how more people can lead to greater agricultural output and less erosion. These conclusions were drawn from observed changes in land use in Machakos district in Kenya from 1930 to 1990. A fivefold increase of the human population in this period contributed to substantial rehabilitation and improvements of degraded land resources. Critchley (2010) noted similar evidence, in a cross-country case study that sampled the Machakos district of Kenya and Passori province of Burkina Faso, which analysed on-farm tree cover changes, using aerial photographs in 1990 and 2009. These empirical works signify that gender-sensitive intervention approaches, continued support to CBOs, and active participation played a role in improving the ecosystem health in spite of increasing population density. Moreover, these scholars raise a fundamental question about the policy and research discourse dominated by the neo-Malthusian perspective. Critchley (2010:25) notes that 'instead of assuming population growth is problematic, why not take the viewpoint that Africa's people are the greatest untapped resource on the continent?'

Scherr (2000) synthesized recent micro-level empirical works that challenged the view of a 'downward spiral' relationship between rural poverty and environmental degradation. Though this view constrains development options and untapped policy trade-offs, Scherr demonstrates that local endowments, conditions for adoption of conservation technology and local institutions are key factors to sustain the livelihood security for poor farmers, as well as to improve the problems of land degradation. He also asserts the possibility of land degradation through natural processes rather than human mismanagement. He underscores that there is a possibility of simultaneously addressing rural poverty and land degradation through development endeavours that accommodate anti-poverty and social justice agendas, food supply and economic development objectives and natural resource protection concerns. 'Although the relationship between poverty and environment is highly variable, the "downward spiral" is both avoidable and reversible in many circumstances' (Scherr 2000:495). For example, the introduction of low-cost, risk-reducing, and productivity-enhancing conservation technologies along with favourable macroeconomic policy and development of road infrastructures has played an important role in triggering agricultural intensification and environmental improvement evidenced by changing land management practices and vegetation between 1968 and 2002 on the central plateau of Burkina Faso (see Reij, Tappen, & Smale 2009). Likewise, the self-help programme in southern Ethiopia, where the highest population density of the country is recorded, is a relevant empirical story[50] to the case at hand. The tragedy of land degradation in the Sodo watershed was reversed not only by mobilizing the public for construction of physical and biological conservation structures, but also by enhancing the productive assets of destitute households.

Overall, supporters of Boserupian theory (eg Ahuja 1998; Ames & Keck 1998; Beshah 2003; Bugri 2008; Critchley 2010; Pender & Gebremedhin 2007; Reij et al 2009) contend that local knowledge systems should be mobilized for sustainable land management. This could be complemented with external knowledge and resources (Sneddon et al 2006). This signifies that conservation technologies must fit not only into the existing farming system, but also into the whole livelihood system of the local community (Perrt & Stevens 2006).

[50] This story was aired by Aljazeera English TV on 11August 2011 at 3:15-4:00 pm, under the broadcasting theme 'WITNESS'.

The next subsection provides a theoretical basis for a balanced optimism on the relationship between the conservation of the natural resources used in agricultural production and population or economic growth.

2.4.4 Neoclassical model: a 'U'-shaped model

Pender (1998) provided this simple application of neoclassical growth theory. At low levels of population density and economic development, households are well endowed with natural resources (natural capital) such as forests and fertile land in contrast to their stock of human produced (human-made) capital. As economic development proceeds, development of infrastructure, markets and technology tends to increase the relative return to investment in human-made capital over natural capital. This induces substitution of human produced capital for natural capital, resulting in depletion of natural capital in the short term. However, once the rate of return of these types of capital is equalized, output effects take over and accumulation of both natural and human-made capital occurs. If human-made capital and natural capital are complementary, output effects outweigh substitution effects in the long term. If labour supply is complementary to both types of capital, then population growth induces investments of both types of capital after their rates of return are equalized. This argument emphasizes the positive role of complementarities between renewable natural capital and human-made capital in promoting sustainable development.

Finally, Pender established the theoretical basis for a U-shaped relationship between the conservation of the natural resources used in agricultural production and population and/or economic growth with a mathematical model. His model suggests that there may be no conflict among the objectives of increasing agricultural productivity, improving resource conditions, reducing rural poverty, and addressing environmental concerns in the course of economic development. This hypothesis is opposed to the inverted U-shaped relationship, which presupposes the trade-offs between economic development and environmental degradation advocated by the neo-Malthusian school of thought.

The model presented by Pender is characterized as Boserupian because of its predictions about the impacts of population growth on investment in renewable resources and other forms of capital. However, it shares the Malthusian pessimism regarding the impacts of population growth on per capita production and consumption, if the coefficients of technology and market development are assumed[51] to be fixed. He claims that there is no contradiction between the Malthusian pessimism of resource degradation as population grows and the Boserupian optimism of induced intensification as population grows (see Pender 1998:105).

Pender's (1998) neoclassical model has four important implications. First, in a context where land degradation occurred because of substitution of more profitable forms of capital for natural capital, population growth may not be responsible for the problem of land degradation in the developing world. Second, population growth eventually induces investments in resource improvements, when land is becoming scarce and tenure is relatively secure. Third, government policies are less viable to deal with the long-term implications of intensification and substitution of natural capital by human-made capital. Fourth, population growth has an implication on reducing per capita income and consumption. This implies that the neo-Malthusian premise on optimum global population may hinge more on considerations of poverty than on considerations of resource degradation or improvement.

Despite the observed variability of the nexus between population density and land degradation, a people-centred development intervention attempts to offer a sustainable livelihood for local communities. The sustainable livelihood approach (see section 3.2) seeks to gain an accurate and realistic understanding of people's strengths (asset or capital endowments) and how these are converted into sustainable use of natural resources (DFID 2001; Ellis 2000). This approach acknowledges both 'welfare poverty' and 'ecological poverty' in which local people are encouraged to develop technical and institutional innovations in natural resource management (Reardon & Vosti 1995; Scherr 2000). The Millennium Development Goals (MDGs) represent a recent and significant pragmatic evolution that attempted to accommodate the two contesting interpretations (weak vis-à-vis strong) of sustainability (Hackett 2006:401). The overall essence of the MDGs is promoting a comprehensive approach and a coordinated strategy to address the interwoven causes of poverty and environmental degradation in the developing world. The MDGs show aspirations to achieve several development interventions, which aim at both causes and consequences of poverty, endorsed by the Millennium Declaration of 189 member countries of the United Nations in September 2000. Although the MDGs adopted by 189 nations and 147 heads of

[51] The premise behind this is the Malthusian pessimism that contends that agricultural production technology exhibits constant or decreasing returns to scale.

state are informed by modernization theory (Peet & Hartwick 2009:135), they mainstreamed a set of interconnected and mutually reinforcing development goals and targets into a global agenda. The principal architect of the MDGs argues that they 'offer the world a chance to do better vis-à-vis the poorest countries after twenty years of failed structural adjustment policies' (Sachs 2005:82). He claims that failure to meet the MDGs signifies the urgency of 'clinical economics' for development. Clinical economics is conceptualized as a 'differential diagnosis' that has to be conducted prior to prescribing uniform development intervention to multiple and complex priorities of sustainable development across space and time.

2.5 Conclusion

This chapter examined relevant literature to lay down the necessary theoretical foundation in analysing the relationship between security of tenure and sustainable use of farmland by studying sustainable development theories, the economic theory of property rights and land tenure security from a sustainable development perspective. The chapter examined the concept of 'sustainable development' both as a goal, which countries or communities strive to attain, and in terms of a process that involves a balancing act between economic growth, social equity and environmental integrity. This is supplemented by a brief outline of the two approaches to sustainable development. On the one hand, the concept of weak sustainability, which is favoured by the mainstream economists, contends that sustained economic growth is a precondition for environmental conservation. On the other hand, the concept of strong sustainability, which is favoured by ecological scientists, contends that environmental protection is a precondition for economic growth. The discussion is consolidated by examining the discourse of development approaches that attempted to deal with the problems of land degradation in the developing world. Though the populist approach provides recognition to indigenous knowledge, both the classic (technical) and neoliberal approaches convey a Western culture and positivist epistemology to redress the problems of land degradation in developing countries.

In addition, the chapter examined the relationship between land reform and sustainable development. The neoliberal development orthodoxy prescribes a suitable and stable property rights regime for sustainable land management practices, essentially on the grounds of a double-pronged effect. On the one hand, private property rights in land or land titling are considered 'capital' that induces further investment. On the other hand, they have a function in pre-empting potential discord and conflict between different tiers of land users/owners by specifying the rights and duties of those in each of the levels. In view of this, the theoretical and empirical basis behind the notions that drive a policy discourse of rural land titling programme to redress the problem of farmland degradation is discussed, to provide a theoretical basis by which to anchor this study. This chapter thus reviewed and defined land-related principles and concepts to indicate how they are understood and used in the study.

Moreover, contemporary debates of sustainable land management are discussed in the chapter. Classical economists and neo-Malthusians hold a pessimistic view about the effects of population growth on the problems of land degradation. They agree with Malthus's thesis that presupposes population growth with the inevitable result of land degradation. On the other hand, the supporters of Boserup's thesis hold the most optimistic view about the effects of population growth on the problems of land degradation. The Boserup model contends that population growth is a major determinant of technological change in agriculture, leading to innovation, improved land care and thus induced intensification. The neoclassical model supports the theses of both Malthus and Boserup. The model thus suggests that public policies and development interventions can influence sustainable use of farmlands depending on the dynamics of the local change process and the relative importance of key factors influencing sustainable farming practice.

Overall, the chapter examined the observed mixed and inconclusive empirical literature on the economic theory of property rights, provided evidence of multiple variables that mediate farmers' decision on conservation investment, and contemporary debates of sustainable land management. The role of the economic theory of property rights about land tenure reform in sub-Saharan Africa was assessed and its adequacy as a model to guide land tenure studies and policy was limited. The neoclassical theory of individualization places great emphasis on market driven property rights structure, and on ensuring the security and efficiency of land transactions but it overlooks important socioeconomic factors that affect how rural productive resources are accessed, used, and contested by individuals or households in support of their livelihoods. In view of this, the next chapter presents the sustainable livelihoods framework and the farming system model to consolidate the theoretical and analytical foundation of this study.

CHAPTER THREE: THE SUSTAINABLE LIVELIHOODS FRAMEWORK AND THE FARMING SYSTEM MODEL

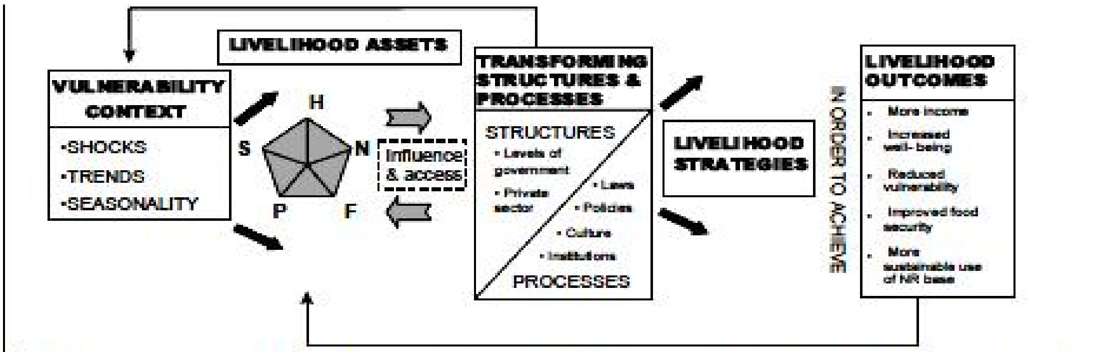
3.1 Introduction

The purpose of this chapter is to provide an analytical framework by explaining the sustainable livelihoods framework and farming system model from a sustainable point of view. This will form the basis to identify the variables and factors that determine sustainable use of farmlands. The chapter has five sections, which are organized in the following manner. Section 3.2 examines the sustainable livelihoods framework considered in this study. Section 3.3 examines the farming system model considered in this thesis. Section 3.4 presents the analytical framework of this study. The chapter is concluded with a summary of main arguments.

3.2 The sustainable livelihood framework

Sustainable livelihoods approaches (SLAs) were developed in the 1980s by various development agencies and organizations and have been adopted, especially since the 1990s, by many as a framework for looking at development issues and addressing poverty (DFID 2001; Messer & Townsley 2003; Thomson 2000). The Institute of Development Studies (IDS), Sussex, developed the first brand framework of sustainable livelihoods. The sustainable livelihood framework (SLF) provides the main factors that affect people's livelihoods, and the interrelationships among these factors. The framework can be used in planning new development initiatives, for impact assessment of existing activities on livelihood sustainability, and assessing the impact of policies on livelihood strategies and availability and access to assets by households (DFID 2001; Ellis 2000; Messer & Townsley 2003; Thomson 2000).

The SLF was further developed by DFID, building on earlier works of the IDS. According to DFID (2001), it consists of five key components, namely the vulnerability context, the five livelihood assets, transforming structures and processes (now commonly called policies, institutions and processes), livelihood strategies and livelihood outcomes. Diagram 3.1 helps to depict the framework and the relationships between the different elements of the framework.



H represents human capital: the skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies;
P represents physical capital: the basic infrastructure (transport, shelter, water, energy and communications) and the production equipment and means that enable people to pursue livelihoods;
S represents social capital: the social resources (networks, membership of groups, relationships of trust, access to wider institutions of society) upon which people draw in pursuit of livelihoods;
F represents financial capital: the financial resources which are available to people (whether savings, supplies of credit or regular remittances or pensions) and which provide them with different livelihood options; and
N represents natural capital: the natural resource stocks from which resource flows useful for livelihoods are derived (e.g. land, water, wildlife, biodiversity, environmental resources).

Diagram 3.1 Sustainable livelihood framework

Source: Sustainable Livelihoods Framework, Guidance Sheets, DFID 2001

3.2.1 Vulnerability context

In Diagram 3.1, households are shown to be pursuing their livelihoods in the context of vulnerability. The vulnerability context includes shocks (sudden onset of natural disasters, conflicts, economic traumas, health problems and crop or livestock distress), trends (in population, resources, health problems, the economy or governance) and seasonal constraints (cyclic fluctuations in prices, production, health and employment). This complex of influences has direct and indirect impacts on people’s livelihoods, including the options available to them (DFID 2001). The translation of a set of assets into a livelihood strategy, composed of a range of employment and income earning activities, is normally mediated by the contexts under which people and their portfolio of assets exist (Ellis 2000). Scoones (1998, in Ellis 2000) divides the context into two. The first, related to the vulnerability context, concerns ‘conditions and trends’, while the other relates to institutions and organizations. Carney (1998, in Ellis 2000) divides the mediating factors into vulnerability context and transforming processes. Both tend to include the same elements in the category: history, politics, economic trends, climate, agro-ecology, demography and social differentiation (Ellis 2000). Trends, shocks and seasonality are factors over which people have limited or no control and these might have negative or positive impacts on the availability of assets and thus choice of livelihood activities and strategies (DFID 2001; Ellis 2000; Messer & Townsley 2003; Thomson 2000). Policies should be put in place in order to mitigate the negative impacts of the vulnerability context or to take advantage of windfall effects of such unprecedented circumstances (DFID 2001; Ellis 2000; Pasteur 2001; Swift & Hamilton 2001; Thomson 2000).

3.2.2 Livelihood assets

In the SLA, resources are referred to as 'assets' or 'capitals' and are categorised into five asset types owned or accessed by family members: human capital (skills, education, health); physical capital (produced investment goods); financial capital (money, savings, loan access); natural capital (land, water, trees etc); and social capital (networks and associations) (Ellis & Allison 2004). Although some asset types may cut across categories, the distinction is useful for analysis. Different assets have varying connections to the policy environment. For example, human capital connects to social policies (education and health), while natural capital connects to land use, agricultural and environmental policies (Ellis & Allison 2004).

Ellis (2000) underlines that the assets owned, controlled, claimed or in some other means accessed by the household are the starting points of the SLF. As a people-centred approach, the SLA seeks to gain an accurate and realistic understanding of people's strengths (assets or capital endowments) and how these are converted into positive livelihood outcomes (DFID 2001; Ellis 2000). The wider availability of assets determines the range and mix of livelihood strategies to be adapted and adopted over time by a household, which results in a positive livelihood outcome (DFID 2001; Ellis 2000; Scoones 1998; Thomson 2000). The poor have limited access to capital assets, and their livelihood outcomes are more at risk since no single category of assets is sufficient to yield diversified livelihood outcomes. As a result, they have to seek ways of nurturing and combining what assets they have, in innovative ways, to ensure their survival (DFID 2001).

The livelihood assets pentagon in Figure 3.1 was developed to enable information about people's assets to be presented visually. The shape of the pentagon can be used schematically to illustrate the variation in people's access to assets. The centre point of the pentagon represents zero access to assets, while the outer perimeter represents maximum access to assets. In this way, different shaped pentagons can be drawn for different communities or social groups (DFID 2001). To some extent, constructing a livelihood may require inclusion of all five capital assets, and Ellis has observed that these assets are the basic building blocks on which households depend to construct their livelihoods (Ellis 2000: 31).

Human capital refers to the labour available to the household. This also refers to household members' skills, knowledge, ability to labour, and good health required to take part in various livelihood strategies (DFID 2001; Ellis 2000). Social capital refers to formal and informal social resources or social relationships of people, such as family networks, membership of groups, relationships of trust, and access to wider institutions of society. It includes social relations, degree of trust, reliability and adaptability. People draw on these social resources when pursuing different livelihood strategies (DFID 2001; Ellis 2000). Natural capital consists of natural resources, comprising land, water and biological resources used by people in pursuit of their livelihoods, including their flow and services. Physical capital refers to production inputs, basic physical infrastructure and production equipment, which enable people to undertake their livelihood activities. Financial capital includes people's financial resources such as savings, supplies of credit, pensions and remittances (DFID 2001). Individuals or households with larger asset portfolios have more livelihood options, as well as less vulnerability, than those with fewer assets (Ellis 2000). People's control over core assets is also dynamic. The stocks of both tangible and intangible assets fluctuate seasonally and through time in response to the contingencies of life (Castro 2001, in Ellis 2000).

Some organisations, such as Concern Worldwide (CW), include political capital as a sixth dimension to an asset portfolio (CW 2006). This is mainly from the understanding that people's participation in policies and the processes largely affects their livelihoods. Thus, policies that help poor people develop and maintain their asset base and diversify their livelihood strategies are essential to sustainable land management practices. To this end, the participation of the poor in the policy-making process largely determines the sustainable positive outcomes of land titling programmes.

3.2.3 Transforming structures and processes

The context of social, economic and policy considerations mediates the translation of assets into a livelihood strategy of income-earning activities (Ellis 2000). Thus, while stressing the importance of capital assets in people's livelihoods, the SLA recognizes the role of transforming structures (government and private sector) and processes (policies, laws, rules and incentives) on people's livelihoods options. These are important in defining access to assets, and people's livelihood strategies and therefore give meaning and value to livelihood assets (Carney 1998; DFID 2001; Scoones 1998). The term 'transforming structures and processes' (TSPs) has now come to be called 'policies, institutions and processes' (PIPs). In livelihoods discourse, there is an unresolved ongoing debate about the definitions and distinctions between institutions and organisations (Ellis 2000). Various authors cited in Ellis (2000) ascribe different names to these mediating factors: Scoones (1998) calls them 'institutions and organisations'; while Carney (1998) calls them 'transforming processes' (in Ellis 2000:38). Reardon and Vosti (1995) sum together all endogenous (PIPs) and exogenous factors (trends, shocks, seasonality) as 'external conditioning factors'. Given the unresolved debate, Ellis claims that 'social relations are distinguished from institutions and the latter from organizations' (Ellis 2000: 38). According to the DFID framework, TSPs are institutions, organisations, policies and legislation that shape livelihoods, and they operate at different levels (international, national, meso and micro levels), thus determining access to different assets, livelihood strategies, as well as the terms of exchange between different types of capital and returns to any given livelihood strategy (DFID 2001).

Policies that are decided at the different tiers of the government affect how households make decisions or use available assets. The most common concern around policies and livelihoods is who makes the policies and what are the processes by which they are formed (DFID 2001; Messer & Townsley 2003**;** Pasteur 2001; Shankland 2000; Thomson 2000). Groups of people who are not consulted about policy or are not represented in the mechanisms that lead to policy formulation have no way of influencing what policies are decided upon. As a result, they may be adversely affected by those policies. Messer and Townsley (2003:10) note that 'policies are particularly important for people concerned with improving household livelihoods because policies can be changed'.

Institutions are processes that include a wide range of 'arrangements' found in societies everywhere. These arrangements can be more or less organised (and may include organisations), structured or unstructured, visible or invisible (Messer & Townsley 2003). Carswell (1997) and Leach et al (1997, in Ellis 2000:10) describe institutions as 'regularized patterns of behaviour structured by rules that have widespread use in society'. North (1991) states that institutions are the rules of the game in the society or, more formally, the humanly devised constraints that shape human interaction.

Institutions may thus be formal and informal, often fluid and ambiguous, and usually subject to multiple interpretations by different actors. According to Scoones (1998:12), 'power relations' are embedded within institutional forms, making contestation over institutional practices, rules and norms important. Institutions are also dynamic, continually being shaped and reshaped over time. They are thus 'part of a process of social negotiation, rather than fixed objects or bounded social systems' (Scoones 1998:12).

Social relations[52] and institutions determine the way in which structures or organisations and individuals operate and interact. They comprise the agencies that constrain or facilitate the exercise of capabilities and choices by individuals or households and they furnish the everyday framework, rules and relations for human interaction. Ellis (2000:39) gives an example of land tenure institutions, explaining that:

> Land tenure institutions … comprise such determinants of access to land as the ownership structure at a particular moment (possibly highly unequal), whether this ownership is defined by private freehold title or by customary rights of access, the existence or not of a market in land, the various tenure contracts that may enable non-owners of land to gain access to land, the social mechanisms for resolving land disputes, and so on. These institutions may work more, or less, well. There is no guarantee that laws and customs with distant historical roots are efficient in the sense of optimal resource allocation, or that they are fair in terms of the way access rules are applied to different types of people.

Together, structures and processes are important mediating factors of livelihoods because they effectively determine access to public and private resources and terms of trade between types of livelihood assets (DFID 2001; Ellis 2000:38).

3.2.4 Livelihood strategies

In the past, development efforts were geared towards improving the services and opportunities available to the rural and urban people. With the emergence of SLA, a paradigm shift in thinking about rural and urban development materialized (DFID 2001; Ellis 2000; Messer &

[52] 'Social relations' here refers to the social status of individuals and households within society. For individuals, social status may be related to factors such as gender, caste, class, age, ethnicity and religion (Ellis 2000:38). Social relations are important here because in any community the distribution of livelihood assets is always uneven.

Townsley 2003). DFID (2001:29) argues that 'the SLA seeks to understand the factors that determined people's choice of a certain livelihood strategy' and 'the livelihoods approach seeks to promote choice, opportunity and diversity' (DFID 2001:28). According to the DFID (2001) framework, the options available to the poor are divided into natural resource based, non-natural resource based, and migration. This expansion of choice and value is important because it provides people with opportunities for self-determination and the flexibility to adapt over time. It is most likely to be achieved by improving poor people's access to assets and to make the structures and processes that 'transform' these into livelihood outcomes more responsive to their needs. This, among others, is promoted through the formulation and implementation of appropriate policies that contribute positively to people's livelihoods (Ellis 1999; Ellis 2000). Thus, a basic understanding of existing policies and how they influence people's livelihood strategies becomes imperative.

Livelihood strategies are the ways in which people combine and use assets to meet their objectives. They consist of activities that generate the means of household wellbeing. Ellis has divided livelihood strategies into two categories, natural resource based activities and non-natural resource-based activities. Natural resource-based activities include harvesting wild resources from forests, cultivation of food or non-food crops, and livestock rearing. They also include non-farm activities like thatching, weaving, or brick making. Some examples of non-natural resource-based activities are rural trading, rural services, remittances and other transfers such as pensions. Livelihood strategies are dynamic, responding to changing challenges that households confront and to which they adapt (Ellis 2000: 40).

3.2.5 Livelihood outcomes

The dynamic interaction between the elements of the framework ultimately results in activities leading to certain livelihood outcomes in a given period. These are known to change over time because all the elements of the framework are dynamic. Unlike other approaches, the SLA 'seeks to recognize the diversity of livelihood goals which in turn will help to understand people's priorities, why they do what they do and where the major constraints lie' (DFID 2001:31). According to the DFID framework, livelihood outcomes consist of, but are not limited to, more income, increased wellbeing, reduced vulnerability, improved food security and more sustainable use of the natural resource base. Ellis and Allison (2004:3) summarize the SLA in relation to livelihood outcomes:

> The livelihoods approach regards awareness of the asset status of poor individuals or households as fundamental to an understanding of the options open to them. One of its basic tenets, therefore, is that poverty policy should be concerned with raising the asset status of the poor, or enabling existing assets that are idle or underemployed to be used productively. The approach looks positively at what is possible rather than negatively at how desperate things are.

Equally, the literature (eg Fernandes & Woodhouse 2008; Reardon & Vosti 1995; Scherr 2000; Wannasai & Shrestha 2007; Vilei 2011) reveals that poor farmers' income and investment strategies are conditioned by a complex interplay of factors. To begin with, the prevailing driving forces associated with the context of vulnerability, shocks and transforming structures and institutions dictate the type and level of poverty in a certain locality. Second, subsistence agricultural production and resource conservation technologies depend on household assets endowments and require modification of technical rates of substitution among livelihood assets, especially between human-made assets and natural resources. Third, relative input prices, output prices, wages, and the interest rate affect farm resource use and investment incentives. Complementary 'hard infrastructure' (such as culverts, dams, wells, market facilities, and roads) and 'soft infrastructure' (such as extension, schools, and medical services) at village level affect the cost of transactions of inputs and outputs, and thus private costs of investment in resource conservation. Infrastructure also influences the development of non-farm activities, the commercialization of agriculture, and urban-rural links, which are important determinants of income opportunities for the poor. Fourth, community wealth (physical, cultural and social assets) mediates the poor household's options and natural resource conservation behaviour in multiple prongs. Therefore, context-specific understanding of the dynamic interplay of several factors that condition sustainable management of land resources provides a more balanced perspective among policy makers and development practitioners.

The neo-Malthusian perspective contends that poverty, agricultural stagnation and land degradation are interlinked (WCED 1987; see section 2.4.2). In the Ethiopian context, this premise is exacerbated by ever-increasing farming population, who are claimants to the scarce arable lands, and the long-term growth in staple food and export crop production necessarily depends upon expansion of cultivable land and intensification of land under cultivation (FDRE 2001; Shiferaw & Holden 2000). Intensification of agricultural production should take place in such a way that future production capacity of agricultural lands is enhanced rather than diminished (Gebremedhin & Swinton 2003; Shiferaw & Holden 2000). This signifies a research agenda for systematic analysis of the microeconomic behaviour of smallholders in order to design appropriate development interventions to redress poverty, land degradation and stagnant agricultural production (Shiferaw & Holden 1998, 1999). This requires an in-depth understanding that goes beyond a universal assertion that regards private property rights in land or population density as prominent incentives for adoption of conservation technology, since they determine the expected returns of investment (Besley 1995). Recent empirical works (eg Carter & Olinto 2003; Kabubo-Mariara 2007; Holden & Yohannes 2002; Pender & Gebremedhin 2007) report that addressing the problem of land degradation calls for a combination of short-term and long-term policy measures to provide adequate incentives for adoption of conservation technologies. Such policies and development endeavours should aim not only at ensuring tenure security, but also at reducing household poverty by enhancing the livelihood assets.

The researcher shares the widely held view of many scholars (eg Besley 1995; Deininger & Jin 2006; Place 2009; Smith 2004) on the presence of a knowledge gap in the literature to improve one's understanding of farmers' investment decisions. Earlier studies (eg see Amsalu & De Graff 2007; Bugri 2008; Kabubo-Mariara 2007; Marenya & Barrett 2007; Pender & Gebremedhin 2007; Shiferaw & Holden 1998; Wannasai & Shrestha 2007) note that farmers have multiple production objectives and, hence, their risk aversion behaviour may not be easily captured by a universal utility maximization model of economic theory. In addition, smallholders' decisions to adopt conservation technologies are mediated by several variables as farm households have a dual characteristic of production and consumption units (Shiferaw & Holden 1999). An individual farmer's decision to implement conservation technologies is thus determined by the perpetual influences of the social world that are found in a given farming system (Beshah 2003:53; Edwards 1993; Van de Flier & Braun 2002; Vilei 2011). Edwards (1993:104) notes that the movement towards research of a farming system emerged as a response to take into account the complex aspects of various farming systems before designing and introducing any development intervention. In view of this, the farming system model helps to analyse a number of contextual variables such as agro-ecological potential, context specific farming practices, market opportunities, policy implementation discourse, and population density to improve one's understanding of existing empirical results. This highlights the need to regard sustainable use of farmlands from a farming system model within the systems theory perspective, which is often overlooked in conventional development thinking and practice. Section 3.3 examines the farming system model.

3.3 Farming system model

A farming system is conceptualized as a natural resource management model operated by the farm household, along with the engagement of household members in other socioeconomic activities, to ensure their physical survival, as well as their social and economic wellbeing (Vilei 2011:2). Thus, a farming system model considers the routines of farming practices along with the perpetual influences of the world outside the farm, such as off-farm employment opportunities, migration and education of children (Beshah 2003; Edwards 1993; Van de Flier & Braun 2002; Vilei 2011). A given farming system is thus shaped by the interplay of factors internal and external to the system.

The farming system model of Leeuwis and Van den Ban (2004) hinges on the works of Roling and Kuiper (1994), which identify key variables that explain practices of human beings, that is, what they do and do not do. Leeuwis and Van den Ban (2004) suggest that human practices are shaped by existing social interactions among different people at various times and in different locations, within the context of a wider social system. Analogically, farmers' practices depends on: i) what they 'know' or 'believe to be true' about the biophysical and social world; ii) what they 'want' or 'aspire' to achieve; iii) what they 'think' they are able to do; and iv) what they are 'allowed' and/or 'expected' to do (Roling & Kuiper 1994, in Leeuwis & Van den Ban 2004:65).

Smallholders' adoption and sustained use of conservation technologies, which helps to ensure sustainable use of farmlands, is inherently mediated by several variables in a given farming system. In contrast, the economic theory of property rights, which is discussed in section 2.3.2 above, excludes useful information contained in the interdependent variables that exist in a given farming system. It is more appropriate to treat sustainable land-use practices of smallholders as an outcome of a compromise among multiple variables in a given farming system (Amsalu & De Graaff 2007; Bekele & Drake 2003). The farming system perspective entered into the arena of systems thinking after the mid 1970s, when researchers began to appreciate the holistic nature of the farming system, which is full of highly interwoven factors (Beshah 2003:52; Edwards 1993; Van de Flier & Braun 2002). The farming system perspective presupposes that an individual farmer will make an investment decision by weighing up the relevant elements contained in the farming system, which are characterized by complex relations and interconnections of technical domain, economic domain and the domain of social-organizational relationships (see Beshah 2003:53; Leeuwis & Van den Ban 2004: 62-64). Although the use of variables incorporated in these domains differs among scholars, previous studies have related farmers' decisions on conservation investment to a range of variables that are often classified as personal, physical, socioeconomic and institutional factors (eg see Amsalu & De Graff 2007; Bekele & Drake 2003; Bugri 2008; Gebremedhin & Swinton 2003; Kabubo-Mariara 2007; Marenya & Barrett 2007; Mekonnen 2009; Pender & Gebremedhin 2007; Pender & Kerr 1998; Shiferaw & Holden 1998; Wannasai & Shrestha 2007).

The farming system model was particularly useful for this study for two reasons. First, it provided concepts and models for describing and analysing endogenous and exogenous variables that affect sustainable land management practices in the case study area. Secondly, it provided a broader framework for investigating and analysing the dynamic feedback of social actors because of changes in organizing principles and rules that mediate an individual farmer's perceptions of tenure security and sustainable land management practices. Diagram 3.2 below shows the selected farming model used in this study.

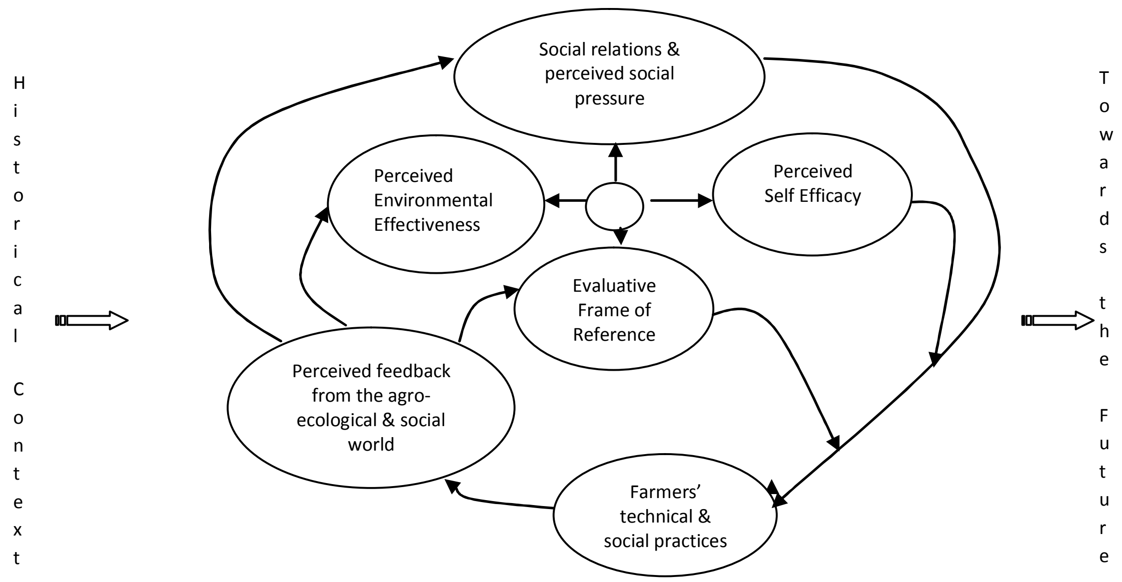


Diagram 3.2 Farming System Model
Source: Leeuwis and Van den Ban 2004:66

Leeuwis and Van den Ban (2004: 66-86) introduced a comprehensive farming system model that helps to visualize important variables that may shape an individual farmer's practices and/or responses towards sustainable use of farmlands. In this model, they contend that evaluative frame of reference, perceived environmental effectiveness, perceived self-efficacy, social relations and perceived social pressure shapes farmers' technical and social practices. This circular model also shows that seasonal farming practices consider the dynamic feedback coming from the practices of social actors. This feedback is always perpetual in nature having a continuous motion that regards the diverse feedbacks coming at different levels and domains of the farming system on the spectrum of time. That is, even if actors are not deliberately seeking feedback, they are always in what is termed as 'reflective monitoring of action' (Giddens 1984:5, in Leeuwis & Van den Ban 2004:81).

The essence of this comprehensive farming system model, which is represented in Diagram 3.2 above, is that an individual farmer's decision on conservation investment is shaped by not only a single perception of tenure security, but also by a careful balance of numerous considerations and tradeoffs. To begin with, the knowledge and beliefs of farmers can originate from various sources, such as local, external, scientific and mutual knowledge. Their 'evaluative frame of reference' is closely related to their knowledge and mode of reasoning about the natural, economic and social world. This overall inclination towards specific farming practice, which is simply termed as 'attitude' by social psychologists, is a result of multiple variables associated with perceived technical and socioeconomic benefits, risk perceptions, and valuation of risks and consequences. Their perceptions about the likelihood of technical, economic, and socio-organizational risks are valued with respect to a set of aspirations. The major sets of aspirations, which assumes different order of importance across the spectrum of time and space, comprise technical (economic), relational (political), cultural and emotional goals and interests of individual actors (Leeuwis & Van den Ban 2004:67-71).

In addition, the notion of 'perceived environmental effectiveness' in the farming system model implies that an individual farmer's decision on conservation investment is shaped by his or her level of trust in the functioning of the social environment. Especially, by his or her perceptions associated with the effectiveness of those existing agro-support networks and intercommunity organizations. An individual farmer's confidence in his or her ability, which is termed as 'perceived self efficacy' in Diagram 3.2, may also be a hurdle to adoption of beneficial conservation technologies when he/she thinks that he/she cannot properly or realistically apply them (Leeuwis & Van den Ban 2004:69).

Moreover, the notion of ‘social relations and perceived social pressure’ in Diagram 3.2 implies that farmers’ practices are shaped by both direct and indirect pressures they experience from other actors with whom they relate and/or associate. These actors include spouses, children, relatives, village leaders, donors, government agencies, extension workers, agro-industry, and politicians. The pressure and influence of these actors or agencies largely originates from their evaluative frame of reference that in turn value costs and benefits with respect to their aspirations. The aspirations of these actors range from a strong intension to maintain power relations, a desire to meet national economic needs, or a wish to maintain cultural norms and values (Leeuwis & Van den Ban 2004:71-79).

Therefore, the essence of the farming systems model is that an individual farmer’s ‘cognitive system’ is made up of a complex and dynamic web of interrelated perceptions. The model has a dynamic nature compared to the economic theory of property rights in explaining an individual farmer’s land management practices. It indicates that a large variety of cultural, technical, economic and relational aspirations and preferences has a role in shaping an individual farmer’s land management practices. Thus, it presupposes that there are different ways of doing things right in a given farming system in contrast with the economic theory of property rights that sees the individual as the only actor who is potentially capable of undertaking sustainable land management practices over which he had private property rights. The economic theory of property rights fundamentally presupposes that there exists only one rationally optimal way of allocating production means and organizing sustainable land management practices. Nevertheless, the common thread that links both perspectives is the role of the ‘cognitive system’ (knowledge and perceptions) in determining an individual farmer’s decision on conservation investment.

The body of literature that deals with the dynamic synergy of various factors that mediate an individual farmer’s ‘cognitive system’ is too vast to be canvassed here. In view of this, a few theoretical perspectives are examined to show the silent determinants of farmers’ decision on conservation investment. In addition, the concept ‘decision-making’ is solely treated as the outcome of lifelong learning processes that are implied by the farming system model. This experiential learning process of farmers is highly mediated by indigenous knowledge and social learning. Accordingly, a short discussion and reflection appears on perspectives of indigenous knowledge and social learning in the subsequent two subsections.

3.3.1 Indigenous knowledge and farming system

Thanks to the work of many scholars and development experts, the concept of indigenous knowledge has obtained currency in the development literature (Beshah 2003:54). The conceptualization of indigenous knowledge is often used interchangeably with local knowledge, traditional knowledge, and tacit knowledge.

The concept of indigenous knowledge implies that 'the people who live in an area and use its resources possess valuable knowledge about the land and its uses' (Rocheleau, Weber & Field-Juma 1988: 38). A piece of knowledge on a given phenomena is developed, tested, improved upon and stored through learning by doing in the community of origin. This makes knowledge indigenous to the locality and its decedents (Brouwers 1993; Leeuwis & Van den Ban 2004). When knowledge developed in this manner, and is transferred from generation to generation it is termed as traditional knowledge (Brouwers 1993). However, the ease of communication in the contemporary globe tends to blend this traditional knowledge with useful ingredients from other sources and changing its indigenous nature. For this reason, some practitioners prefer to use 'rural people's knowledge' instead of indigenous knowledge or traditional knowledge (Brouwers 1993:46).

There are ample opportunities for cross-fertilization of indigenous and scientific knowledge to development practice (Leeuwis & Van den Ban 2004). For example, Rocheleau et al (1988:42) note that working closely with land users helps the scientific community to identify promising species for agro-forestry systems, and to understand what local people already know about the environment and the local economy. These recognitions drew the attention of development practitioners to a 'multi-level stakeholder approach to sustainable land management' (Hurni 2000:85). Farmers have their own way of perceiving things in their farm and community. As they perceive, they shape their practices using their evaluative frame of reference. The perceptions of farmers about the agricultural landscape, its problems and solutions are frequently different and sometimes at odds, with that of scientists and policy makers (Fernandes & Woodhouse 2008; Hurni 2000; Van de Flier & Braun 2002; Vilei 2011).

Local people learn through concrete experience rather than through theory formulation and testing. Their theory originates from previous experiences that are subsequently tested through practice rather than from divergence or assimilation which focus on abstract conceptualization (Kolb 1984:27). Richards (1985:155-156), when referring to farmers' experimentation, writes that farmers make their points on the ground, not on paper. The starting point is, therefore, to examine the practices of actors in a given domain of indigenous knowledge.

3.3.2 Social learning and farming system

Indigenous knowledge is the result of social learning that is generated through social interaction as a person tries to make his or her environment suitable for living. Goldstein (1981:236-240) provides some cogent accounts of social learning. He states that social learning is a form of learning to occur in a social context for the purpose of adaptation of individuals and society. This implies that social learning mediates context-specific allocation of production resources to address the fundamental questions of economics: what to produce? where? why? and by whom? It also shows the merits of a normative approach to deal with context specific epistemological questions in contrast to a positivist approach. The latter relies on utility maximization models that presuppose universalization of Western values of rationality, individualism and efficiency by neglecting the African values of common good, solidarity and consensus building.

Woodhill and Roling (1998:47) note that social learning is the process of social change, cultural transformation and institutional development necessary to achieve context specific allocation of production resources. They further add that social learning must address issues of social structure that signify its social nature. This view is further echoed in Woodhill's definition of social learning. 'Social learning is a process by which society democratically adapts its core institutions to cope with social and ecological change in ways that will optimize the collective wellbeing of current and future generations' (Woodhill 2002:323). He notes that the social context provides a transactional character whereby symbols and values enhance an environment conducive to learning. The quest for learning could be purposive or emergent, which originates from the nature of a human being who is goal-directed and a solicitor for change when faced with unfavourable environments, in influencing human behaviour. In addition to simple technical and economic considerations, a range of other, often less tangible, issues play a role in shaping farmers' practices; these include issues of power, identity, culture, conflict, religion, risk and trust. Consequently, the process of social change occurs in a series of social interactions between people at various times and in different locations, within the context of a wider social system (Leeuwis & Van den Ban 2004:64).

Social learning helps us to adapt to the environment around us in such a way that we prepare ourselves to intentionally face the reality as it unfolds in front of us. Thus, through social learning, people shape their conceptions of the past as they interpret it, the present as they construct it, and the future as they envision it (Goldstein 1981:54). Social learning takes place in a collective environment where there is adequate room for negotiation. Leeuwis and Van den Ban (2004:161) identified four ‘aspects’ but not ‘stages’ of experiential learning that participants in a social learning process must go through: becoming aware, becoming interested or mobilized, becoming involved in active experiential learning in the context of negotiation, and establishing adapted practices and routines.

The composition of partners in social learning process usually changes depending on the issue under deliberation. In relation to this research project, for instance, it should comprise of individual farmers, group of farmers or those that represent the leadership positions of CBOs, social scientists, natural scientists, policy makers and administrators to deal with the issue of ‘sustainable use of farmlands’ (Van de Flier & Braun 2002). It is also worth noting, breaking institutional barriers that separate farmers and other stakeholders is vital for long-term exchange of knowledge and information between them (Miller & Curtis 1999; Scoones & Thompson 2009). The most frequent barriers associated with culture and attitudes, financial resources, centralization of research, and top-down extension services could easily be dealt with using a variety of participatory techniques and approaches (see Leeuwis & Van den Ban 2004:155-161& 224-245).

In addition, understanding contexts of social learning merits special attention in order to fully achieve learning in the real life situation, not only to a person as a learner but more importantly to a person as the resource manager (Van de Flier & Braun 2002). Learning to solve problems of the farming system requires not only perceptions of individual farmers but also resources from the external environment. Individual farmers and/or the community often reject the rhetoric of scientific knowledge system without the availability of the complementary resources and incentives for learning to take place because they learn for immediate use (Perrt & Stevens 2006). For instance, it was observed that farmers do not have the incentive to invest in agro-forestry systems without well-defined land rights (see Barbier et al 1997:892). Moreover, social learning is not learning among a few individuals in the community and observed by outsiders, but a process that should spread sooner or later. In this connection, Woodhill and Roling (1998:54) note that 'social learning should be thought of as a society wide process. It is not an exclusive or elite task for 'scientists', 'experts' or 'intellectuals''. The interrelationship between the individual and society facilitates social learning in a community. Whether the quest for an alternative originates from an individual or group or an entire society, practices that are consistent with the social system are likely to spread in the community. When more people are involved in practice, it is likely that it will be modified and developed to fit different members of the community.

In the preceding sections, the basic processes through which experiential learning could be perpetuated in society and how the 'cognitive system' of individual farmers is mediated by collective knowledge towards context specific farming practices was discussed. These notions help to understand better the cognitive side of human behaviour that underlies every decision of an individual farmer, even though its effects are mediated by non-cognitive elements such as socioeconomic status and external environment outside the farming system.

In light of the above, the study briefly examined the relative magnitude of both cognitive and non-cognitive determinants of the decision on conservation investment in the context of the study area. This study measured study participants' knowledge and attitude towards tenure security and sustainable use of farmlands from responses of statements designed in the primary data gathering instruments. Annexes I and II show the instruments used for gathering the primary data. Knowledge is measured from responses given to questions that seek farmers' perceptions of, and information about soil degradation, tenure security and conservation technologies. Attitude is measured from responses given to questions that seek their behavioural responses (such as evaluation, feelings, inclinations, intentions, commitments and actions) towards soil degradation, tenure security and conservation technologies. To this end, open-ended questions were designed for group interviews (FGDs) and individual interviews to measure knowledge and close-ended questions were designed for individual interviews to measure the attitudes of study participants.

The SLF of DFID is proposed as the basis for qualitative analysis since it covers the full diversity and richness of livelihoods and associated dynamic effects of 'driving forces' on the environmental degradation. The framework acknowledges that driving forces to context specific farming practice (‘response’) are various social, economic and political forces as well as ‘natural’ factors. In simple terms, it considers ‘response’ of a given farming behaviour or livelihood strategies as the outcome of not only farmers’ (resource users) decisions at the local level but also changes in legislation and policy at the level of the national government. The five categories of livelihood assets (natural, physical, social, financial and human capitals) within the SLF clearly correspond to a particular environmental condition or ‘state’. It then suggests that a ‘response’ to a particular environmental condition or ‘state’ becomes a ‘driving force’ that will influence future conditions of environmental state in a circular flow. The indicators of the ‘state’ or components of livelihood assets thus have an important implication for the outcomes of existing ‘driving forces’ and also the effectiveness of current ‘response’ (see Fernandes & Woodhouse 2008:245-246). Moreover, the livelihood assets, which could be termed as stock of capitals in the economic jargon, cover the important social, economic and ecological aspects of sustainable development emphasized by the Brundtland model (see section 2.2). The following table summarizes the analytical linkages made between livelihood assets and the dimensions of sustainable development in the existing literature.

Table 3.1 Potential indicators that connect sustainable livelihoods with sustainable development

Indicators	Livelihood asset category	Sustainability dimension
Income diversification Access to credit	Financial capital	Economic
Crop productivity Quality of product Crop diversity Farm size Soil quality or fertility No pests/disease Soil conservation measures Climate/weather Biodiversity Absence of soil erosion Biological crop protection	Natural capital	Ecological
Food security Health Knowledge Education of children Family size	Human capital	Social
Water quality for household Use of improved seeds Housing quality Condition of road to market Water availability on farm Farm implements Distance of field to house Market access Labour requirements	Physical capital	Social
Security of tenure Membership in organization Training Accountability of representatives No theft	Social capital	Social
Local taboos and beliefs Gender roles in farming system Role of women in decisions associated with land-related investment Cultural economy (i.e. labour and livestock sharing, ingenious customs and institutions for mutual assistance)	Cultural capital	Social

Source: adapted from Vilei 2011; Fernandes & Woodhouse 2008

Having said this about the theoretical and empirical literature that informed the basic epistemological questions, the next section examines the analytical framework used in this study.

3.4 Analytical framework of this study

This study aims to combine the sustainable livelihood framework developed by DFID (2001) and the farming system model of Leeuwis and Van den Ban (2004) in an attempt to identify variables that determine sustained and continued adoption of conservation investment; thereby sustainable use of farmlands (see section 1.7). Thus, a generic analytical framework that combines the sustainable livelihood framework and the farming system model was used in this study. The SLF asserts that the prevailing external environment that mediates the status of livelihood assets at household level dictates land users' livelihood strategies, thereby their behaviour towards dynamic farming practices over time (see section 3.2). The farming system model also articulates that an individual farmer makes a decision on sustainable land management practice by weighing up the complex relations and interconnections of technical domain, economic domain and the domain of social-organizational relationships (see section 3.3).

The starting point of developing this analytical framework appreciates the diversity of political and institutional perspectives, as well as the development practices derived from them. The three common approaches that informed development practices, which aim to redress the problems of land degradation in developing countries, were examined briefly in section 2.2.2. The development of this analytical framework is also based on the works of other scholars (for example Fernandes & Woodhouse 2008; Reardon & Vosti 1995; Vilei 2011) to select indicators of the variables considered in the study, and categorize them under six livelihood assets and three dimensions of sustainable development (see Table 3.1 above). During the preparation of primary data gathering instruments, the selection of variable indicators was done in light of the theoretical propositions and conceptual models that appeared in the preceding sections of Chapters 2 and 3. Accordingly, the nature, pattern and extent of the relationship among tenure security and sustainable use of farmlands, based on specified dimensions and identified indicators of the variables considered during the preparation of primary data gathering instruments, are discussed and analysed in Chapter 7. The various socioeconomic, cultural and institutional, as well as biophysical and technical factors that could potentially affect the sustainable use of farmlands, are also discussed and analysed with the aid of the analytical framework presented in section 3.4. Diagram 3.3 below shows a basic sketch of the analytical framework used in the study.

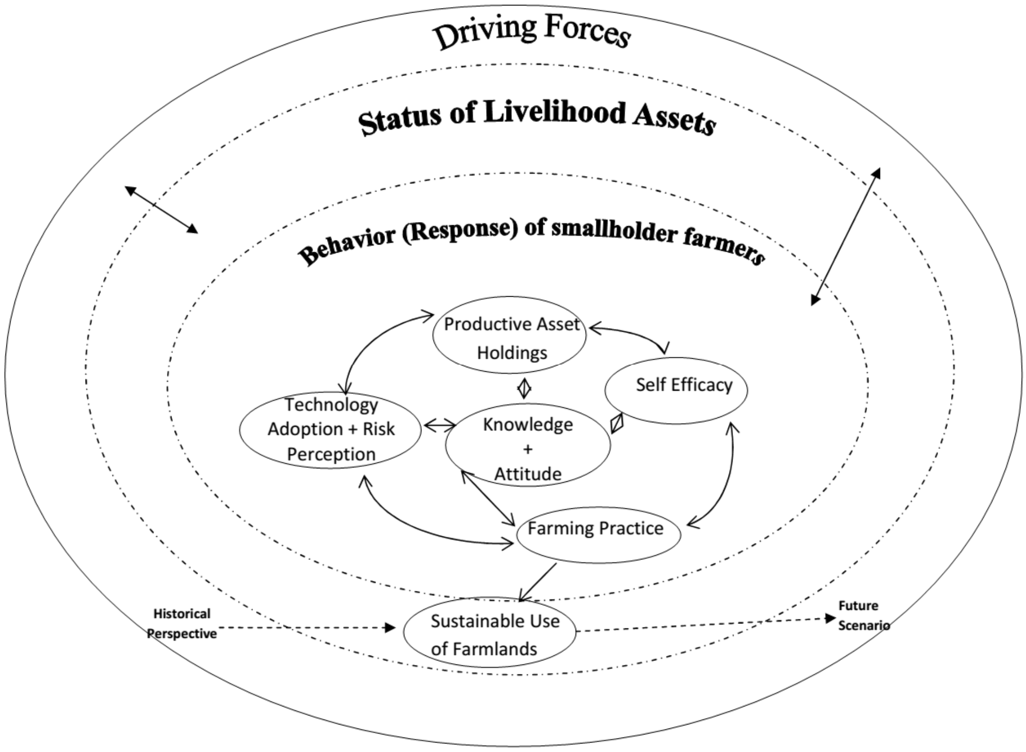


Diagram 3.3 Analytical framework used for this study

Source: Own hybrid

The analytical framework presented in Diagram 3.3 above, based on the SLF and the farming system model, makes certain assumptions:

- The behaviour (response) of smallholders towards a particular farming practice in a given period depends upon their productive asset endowments, self-efficacy, knowledge and attitude, and technology adoption and risk perception (see the inner circle).
- These determinants of smallholders' behaviour in turn are mediated by driving forces that allocate productive resources among farm households (see a double-headed arrow that connects the inner circle with the outer circle).
- The initial farming practice would become a driving force to the next production period through its effect on the status of livelihood assets available to farm households (see a double-headed arrow that connects the middle circle with the outer circle). That is, the outcome of the current farming practice determines the status of farmland

available to farm households, which in turn becomes a driving force to the next production period. If the outcome of current farming practice results in the proper use of farmlands, it would become a positive driving force since it enhances the status of livelihood assets available to the next production period. If the outcome of current farming practice results in degradation of farmlands, it would become an adverse driving force as it depletes the status of livelihood assets available to the next production period. The single-headed arrow that connects 'farming practice' with 'sustainable use of farmlands' shows a cause-effect relationship between farming practice and driving forces. Thus, farmland is assumed to be the most important productive asset possessed by farm households, which dictates the status of other productive asset endowments.

Driving forces considered in the analytical framework comprise three aspects: i) the vulnerability context associated with demography and land degradation; ii) shocks associated with droughts, flood, pest and diseases; and iii) transforming structures and processes found at various spatial levels, such as laws, policies and institutions that allocate means of production and distribution of outputs. The analytical framework also considered six types of livelihood assets or capitals such as natural, physical, social, human, financial and cultural capitals. The first five are consistent with the asset categories included in the SLF, while the sixth is added in the analytical framework from Viederman's (1996) conceptualization of sustainable development, which is regarded as a working definition (see end of section 2.3). These six capitals are considered since they determine the productive asset endowments, self-efficacy, knowledge and attitude, and technology adoption and risk perception of farm households.

Diagram 3.3 shows that driving forces of the external environment shape livelihood strategies of smallholders, and thereby their behaviour to particular farming practices across space and time. The inner circle of the diagram also shows the synergy of multiple variables that shape the initial farming practices of an individual farmer. The variables included in the inner circle were based on the theoretical propositions discussed in the farming system model. The diagram also illustrated that an individual farmer's farming practice determines the status of renewable natural capital (farmlands) on which his or her livelihood depends. The status of this livelihood asset along with five other forms of capital, determines his or her productive asset holdings (see a single-headed arrow that connects farming practice with sustainable use of farmlands included at the middle circle). The middle circle traces the status of current livelihood assets that are expected to have a dynamic synergy with the driving forces (see a double-headed arrow that connects the middle and outer circles). The diagram finally shows that the initial farming practice becomes a driving force that shapes an individual farmer's experiential learning or his or her sustainable land management practices. The expected synergies are shown in the analytical framework using double-headed arrows that link status of livelihood assets with driving forces, driving forces with the behaviour (response) of an individual farmer, and among variables assumed to mediate the behaviour (response) of an individual farmer. The analytical framework also uses broken arrows to show the expected linkages between past (historical perspective of) driving forces and the outcome of current farming practice (concept of 'sustainable use of farmlands'), as well as the linkages between anticipated outcome of current farming practice and the future scenario of driving forces.

The analytical framework helps us to understand not only the pre-decisional processes, but also the post-decisional processes of continued and sustained use of conservation technologies. The pre-decisional processes are illustrated by the inner circle, which assumes the determinants of smallholders' behaviour (response) towards a particular farming practice. A single-headed arrow connecting farming practice with sustainable use of farmlands, and a double-headed arrow connecting the middle circle with the outer circle illustrate the post-decisional processes. The analytical framework also tried to connect the microeconomic behaviour of smallholders with the macroeconomic institutional support systems provided to the farming community. This framework considers the various socioeconomic, cultural and institutional factors, as well as biophysical and technical factors that could potentially affect the sustainable use of farmlands in the context of the study area.

3.5 Conclusion

Chapter 3 examined relevant literature to consolidate the necessary theoretical and analytical foundation in analysing individual and group motivations towards sustainable land management practices. It examined the SLF framework provided by DFID (2001). The SLF presented in the chapter seeks to understand the dynamic relationship among the vulnerability context, livelihood assets, transforming structures and processes, livelihood strategies and livelihood outcomes. It thus sees farmers' motivations towards sustainable land management practices as the outcome not only of farmers' (resource users) decisions at local level, but also dynamic changes in the vulnerability context, status of livelihood assets possessed and changes in legislation and policy at the level of the national government.

In addition, the chapter examined the farming system model developed by Leeuwis and Van den Ban (2004). This comprehensive farming system model asserts that knowledge and perceptions are not neutral, but are subject to social influences and related to social interest. It thus presupposes that the learning process of individual farmers is always changing with the deliberateness and consciousness dynamism of the social environment. In line with this, the chapter examined the theoretical propositions of indigenous knowledge and social learning to show the silent determinants of farmers' decisions on conservation investment. The dynamism of various variables in a given farming system implies that a rational and optimal decision of last year's conservation investment may not be rational and optimal this year to the same individual, let alone to other individuals.

Finally, the chapter provided a generic analytical framework that helps to gain insight not only on pre-decisional processes, but also on post-decisional processes of continued and sustained use of conservation technologies. The analytical framework is developed by combining the SLF with the farming system model. The next chapter presents the case of Ethiopian smallholder agriculture in light of the SLF and the farming system model discussed in this chapter.

CHAPTER FOUR: THE CURRENT FARMING SYSTEMS AND RURAL LIVELIHOODS FRAMEWORK IN ETHIOPIA

4.1 Introduction

The purpose of this chapter is to discuss the Ethiopian context with a focus on the dominant farming systems models, livelihood assets and livelihood strategies in rural Ethiopia. In order to put these in a context, the chapter starts with a brief discussion of the role of land in rural Ethiopia. This is followed by a brief outline of the role and development of the agricultural sector in the Ethiopian economy. The fourth section provides a summary of the evolution and status of macroeconomic policy framework in the country and its implications for rural land use and other resource allocation decisions. The fifth section discusses the four farming systems of the country in which emphasis is given to the biophysical environment, land-use system, indigenous land management practices, and structure and constraints of the farming systems. The sixth section presents the status of livelihood assets and strategies within these farming systems. The last section provides a summarized conclusion of the chapter.

4.2 The role of land in rural Ethiopia

The issue of land tenure is a source of controversy among academicians and politicians in present-day Ethiopia (see section 1.4). In rural Ethiopia, land remains the primary means for generating livelihood, as well as the main vehicle for production investment, accumulating wealth, and transferring wealth between generations (EEA 2002; Rahmato 2009). The 1995 constitution of Ethiopia (FDRE 1995) guarantees free access of land to rural households who seek and can cultivate in their place of residence. Land is defined in the constitution as the property of the people, but is administered on their behalf by the state.[53] In effect, land is still state property, and farmers thus have only use rights over plots in their possession. Such access through the official channel is conditional on proof of permanent physical residence, ability to farm continuously, and meet administrative dues and obligations. Qualified farmers have lifetime use rights through land registration and certification, which can be transferred to their legal heirs, particularly to their children (see sections 1.3, 1.4 and 1.5). Instead of working on their parent's land, the children may claim land as they reach eighteen, the legal

[53] The key articles in the Constitution regarding land tenure are Article 40, Sub-articles 3,4,6, and 7; and Article 52, Sub article d (FDRE 1995).

age for claiming land. There are moral and technical grounds for children to claim land of their parents. First, it is customary in the kinship/*rist* tenure areas for the children to claim land through descent (Adal 2002; Jemma 2001; Kebede 2002). It is also a moral obligation for parents to look after their children until they are self-sufficient (Teklu 2003). Second, during the implementation of the 1975 radical land reform, land was redistributed based on the number of family members (Holden & Yohannes 2002:574). Thus, the children's share of land was included in their parents' land holdings at the time of land allocation through peasant associations (Teklu 2003:9). Indeed, the subsequent periodic land redistributions in the post 1975 period are criticized in the literature for their failure to take into account the criterion of family size (see Adal 2002; Jemma 2001).

There are notable variations in the extent and trend of modes of access to land in rural Ethiopia. Farmers obtain land mainly through the area-based local government administrative structure known as *kebele* administration (which was called peasant associations during the previous regime). While this has been the main venue for accessing land, its importance is declining because of the physical limit imposed by the fixed area of land in the face of rising farm households (Teklu 2003:9). The current land registration and certification scheme has also hampered the prospects of periodic land redistribution to accommodate new claimants (ANRS 2006; FDRE 1997, 2005). Instead, access to farmland through rental land markets is gaining importance in contemporary Ethiopia. Land cannot be sold, exchanged or mortgaged, but the present policy does allow shorter leasing or sharecropping as well as hiring of labour, both of which were illegal under the Derg regime. Farmers who participate in rental land markets can combine rental land contracts with other factor markets (eg labour, oxen, credit) and overcome problems associated with missing or incomplete factor markets (EEA 2002:78; Pender & Fafchamps 2005). Nevertheless, access to rental land is becoming difficult for farmers with little farming experience, skills or cash (Teklu 2003:51). These farmers work on their parental land or as casual labours or engage in non-farming activities (Gebreselassie 2009:27).

Tenant farmers who depend on rental land for cultivation share only part of the increase in agricultural output or income. The net income gained as a result of land rental markets depends on the area of land rented, increment in land productivity, and output and cost sharing arrangements (EEA 2002:78; Teklu 2003:45). While the rental land markets appear to equalize the distribution of land holdings, their effect on income distribution could be discriminating if rental rates rise to offset the gain from improved productivity. In the land-constrained environment of Ethiopia, rental rate rises with an increase in land scarcity (Pender & Fafchamps 2005; Teklu 2003). For example, rental rate has historically increased from one third to 50 : 50 in output shared (Teklu 2003:49). As land becomes scarce, those who lease out land demand that tenants contribute a large share of variable inputs. In some instances, a cash advance is required to obtain access to rental land or to continue to farm on lease holdings (Teklu 2003:51). To the extent that the tenants start from low-income positions, rising rents redistribute income to the lessor, and, hence, the net income gain from agricultural production and productivity growth could be diminished to rural poor (Haile Gebriel 2004; Pender & Fafchamps 2005).

Poverty in rural Ethiopia is widespread and deep, and high, even by African levels, though it fell substantially between 1989 and 1995 (Dercon 2006). Poorer households have larger family size and possess fewer productive assets such as land and livestock, while they are primarily engaged in subsistence farming (Amare 2002:36; Teklu 2003:53). They have an income that is spent mainly on food, but is still not sufficient to meet their food requirements for a healthy and productive life (Massow 2000). Inadequate food consumption also relates to poor nutritional status of children and adults. The vulnerable and destitute households are those who do not own either oxen or land (Amare 2002; McCann 1995). Those households are often forced to enter into unfavourable sharecropping arrangements (EEA 2002:74; Kebede 2002:116; Pender & Fafchamps 2005:254). In sharecropping arrangements (an informal contract among farmers), the farmer who uses the physical asset (plough or ox/en) of the other farmer in return pays a large amount of crop on harvest. Poorer farmers are always disadvantaged in this type of sharecropping arrangement as they cannot afford to refuse the contract because their land remains fallow, which ultimately ended up in the hands of those with the means to cultivate. There is another type of sharecropping agreement on poor-quality plots between the landless and landowner households in which ‘usually one-half or one-third’ of the harvest goes to the landowner (Pender & Fafchamps 2005:254). A sharecropping arrangement undoubtedly restrains the adoption of new technologies (EEA 2002:74; Ellis 1980:530; Gavian & Ehui 1999:46) and sustainable land management practices (Pender & Gebremedhin 2007). Empirical studies found that total labour and oxen use per hectare were lower on sharecropped fields than other fields (Gavian & Ehui 1999; Pender & Fafchamps 2005). The misfortune of vulnerable and destitute households is reinforced when natural calamities affect crop yields, as their debt could be postponed to the next farming season (Amare 2002).

A typical income portfolio of rural households comprises diversified income sources, but agriculture is the primary source of employment, production and subsistence. Because the majority of the poor are engaged primarily in agricultural activities, poverty in rural areas is largely related to low productivity of farm labour, which in turn is related to small farm size, poor quality of land (soil fertility in particular), low rate of application of improved technology, shortage of physical capital (eg traction animal and farm equipments), poor health and labour supply conditions, and constrained access to agricultural markets because of weak road infrastructure and service-providing institutions (see section 4.6).

Critics of the current land tenure system (eg Beyene 2004; EEA 2002; Gebreselassie 2006; Rahmato 2004; Rahmato 2009) argue that the current policy contributes to stagnant agricultural production and land degradation since it promotes insecurity of tenure. Moreover, it constrains land transactions, has inhibited the emergence of a dynamic land market, promotes fragmentation of land, puts growing pressure on land resources because it discourages[54] rural people from leaving their farms for other employment opportunities, and gives the state power over the farming population because land is state property. The administration of land is vested in the Environmental Protection Land Administration and Use Authority (EPLAUA), which was recently established by law in each regional state. Each authority is also responsible for environmental protection and natural resource management. While some of the regional legislations were issued before this authority was established, the body has been given the power to draft legislation and issue policy guidelines. For example, Amhara Land Administration and Land-Use Proclamation of 2006 sets out a number of obligations with which smallholders have to comply as a condition of keeping the land in their possession. These include undertaking soil and water conservation measures, planting tree species, employing proper land management practices, and constructing flood control structures, and other land improvement measures (ANRS 2006). The legislation states that holders who fail to carry out these obligations will lose their rights to the land. This gives

[54] As discussed extensively in section 1.2 and 1.5, the current land tenure system obliged farmers to cultivate the land continuously and permanently live in the locality. The user rights to land is thus dependent on permanent residency in rural area and engagement in agricultural pursuits along with adopting 'proper' land management practices.

bureaucratic power to expropriate someone for having failed to fulfil his or her obligations, or because he or she has been away from the locality for some time (Rahmato 2004).

4.3 Role of agriculture in the Ethiopian economy

The Ethiopian economy has shown double-digit growth rate since 2005. Real GDP[55] grew at an average rate of 11 per cent from 2005/06 to 2009/10. This is a significant leap over the 6.2 per cent average growth rate of the five years period prior to 2005/06 (EEA 2011:6). With an average population growth rate of 2.6 per cent (FDRE-PCC 2008), the high growth in GDP translates to high per capita income growth that had potential to reduce poverty with significant margins. However, per-capita gross national income of US$930 was 21 per cent below the average of low-income countries (US$1174) in 2009 (World Bank 2010). The pace of urbanization in the country is also slow in contrast with other low-income countries. The 2007 census indicates that only 16 per cent of Ethiopian population live in urban areas and the remaining 84 per cent in rural areas (FDRE-PCC 2008). The government believes that much has to be done in the agricultural sector to tackle the problem of widespread poverty and realize its vision for the country to join the middle-income countries by 2020 (EEA 2011).

The agricultural sector is dominated by small-scale subsistence farming, which accounts for 95 per cent of the total area under crops and more than 90 per cent of the total agricultural output (Arndt, Robinson & Willenbockel 2011; Hanjra, Ferede & Gutta 2009). The share of agriculture in total GDP has been constantly ten percentage points above the average for east African countries (Ethiopia, Burundi, Kenya, Rwanda, Sudan and Uganda) in the past three decades. Agriculture accounted for 56.5, 58.4 and 45.6 per cent of GDP in Ethiopia in the 1980s, 1990s and 2000s, respectively; the comparable average of east African countries in this period was 46.7, 45.1 and 35.4 per cent, respectively (IFPRI 2011:5). Likewise, the share of agriculture in the Ethiopian GDP is much larger than the comparable average of low-income countries. It was 44 per cent in contrast with the average of 26 per cent for low-income countries in 2008 (World Bank 2009). Agriculture employs 80 per cent of the country's labour force (Arndt et al 2011; Hanjra et al 2009). These figures reveal is a typical agrarian society in which nearly 50 per cent of the GDP is produced by 80 per cent the agricultural sector. On the other hand, the declining trend of agriculture's share to GDP may point to the ongoing

[55] Real GDP measures the inflation-adjusted monetary value of final goods and services produced in a given economy per year.

structural transformation of the Ethiopian economy. The work of Kuznets (1966) and Chenery and Taylor (1968) demonstrate that the share of agriculture to GDP and to total employment declined relatively during structural transformation (cited in Agrawal & Lal 1993). In Ethiopia, however, the share of labour in agriculture is larger than the share of agriculture in GDP showing differentially lower labour productivity in agriculture and hence higher poverty (De Janvry & Sadoulet 2010).

Agriculture contributes the largest share of Ethiopia's total export earnings. The share ranged from 83 per cent in 2005/6 to 88 per cent in 2008/9. The value of export earnings from the sector reached 13.3 billion Birr[56] (approximately US$1 billion) in 2008/9. The major commodities that contributed the largest share of export earnings in this period were coffee, pulses and oil seeds (EEA 2011:32). Overall, smallholder agriculture plays a pivotal role in terms of its contribution to GDP, employment generation and export earnings. In the recent five years, crop production contributed 64 to 66 per cent, livestock and hunting 26 to 27 per cent and fishery 8 to 9 per cent share of agricultural GDP. In this period, the growth rate of the agricultural sector declined from the highest 10.9 per cent in 2005/6 to 6.4 per cent in 2008/9, before it increased slightly to 7.6 per cent in 2009/10 (see EEA 2011:29). Though this fall in growth rate is related more to a reduction in the growth of value of crop production, the data show that the rate of reduction for the various subsectors of agriculture has been uniform.

In the context of agrarian societies, five important challenges could be identified in promoting the growth rate of the agricultural sector. These are i) geographical and infrastructure challenges; ii) environmental degradation; iii) exposure to risk and vulnerability; iv) appropriate technologies for a heterogeneous sector; and v) low labour mobility and the small size of the rural non-farm sector (Delgado 1995). These problems can be summarized as lack of proper economic policy in general, and rural and agricultural development policy in particular (Brietzke 1976; EEA 2002; Gebreegziabher 2011). The next section examines the evolution of macroeconomic policy framework and status of current agricultural development policies.

[56] Birr is the Ethiopian currency. At the beginning of 2012, US$1 was officially exchanged for 17.581Ethiopian Birr.

4.4 Macroeconomic policy frameworks and agricultural development policies

In Ethiopia, three macroeconomic policy frameworks have been formulated under three political regimes since the beginning of the twentieth century. These are the feudal policy framework of the imperial regime of 1950-1974, the socialist policy framework of Derg in 1975-1991, and the semi-liberal and market-oriented policy framework of the current regime from 1991 to date. During both the imperial and Derg regimes, the country's development strategy was based on import substitution industrialization (ISI). The ISI strategy focused on industry and neglected the agricultural sector, particularly subsistence farming (Bekele & Drake 2003:438; IFPRI 2011). The development policies of the imperial regime were conceived in favour of commercial farms held by a few feudal landlords, and were followed by the Derg[57] policies that favoured socialized enterprises such as producers' cooperatives and large-scale state farms (see Brune 1988; Rahmato 2009; Robinson & Yamazaki 1986). In a context where the economy depended on smallholder agriculture for its capital accumulation, food supply, raw materials, foreign exchange earnings and market demand, the ISI strategy failed to produce higher overall GDP growth rates. Instead, it contributed to slow growth of food and industrial crops, low foreign exchange earnings and low savings during the pre-1991 period (IFPRI 2011; Robinson & Yamazaki 1986).[58] The current regime, which came into power in 1991, made a radical shift from a policy of 'industry first' to one of 'agriculture first' (FDRE 2001).

The current regime initiated a development strategy known as agricultural development-led industrialization (ADLI) after 1994. ADLI is described as focusing on increasing the productivity of smallholders through the diffusion of fertilizers, improved seeds, credit schemes, expansion of the road network, and improvement of primary health care, education and water supply infrastructures (FDRE 2001; MoFED 2005). The regime also issued a policy guideline to minimize the adverse effects of chemical fertilizers and pesticides after the

[57] A series of policy measures were introduced by the Derg because of the socialist ideology the regime adopted. The main ones, such as establishment of producer co-operatives, control of agricultural marketing, collectivization, villagization and resettlement have had far-reaching consequences for smallholder agriculture, rural life and land use (Brune 1988).

[58] Drought, crop failure, livestock epidemics and war adversely affected the contributions of both agricultural and non-agricultural sectors to the country's GDP in 1970s, 1980s and 1990s (Keller 1992; Kiros 1991). The country experienced recurrent drought and crop failure, which jeopardized the contributions of agricultural sector to the economy. Livestock epidemics had also been a major cause of famine as draught power is an important farm input. Above all, the war with Somalia, the Eritrean Liberation Front and the rebel groups in northern Ethiopia jeopardized the contributions of agricultural and non-agricultural sectors to the country's GDP.

Johannesburg World Submit on Sustainable Development in 2002 (Devi, Kumor & Beboch 2007).

The ADLI strategy viewed agriculture as the engine of growth, because of its potentially superior growth linkages, surplus generation, market creation, and provision of raw materials and foreign exchange. However, to fulfil these functions and its role as the engine of growth, the agricultural sector should be able to demonstrate that i) it can grow at a sufficiently higher rate, ii) the source of its growth comes from a combination of productivity improvements and expansion of arable lands, and iii) it is able to establish good backward and forward linkages with other sectors of the economy (FDRE 2001).

EEA (2002:25-26) contends that the success of ADLI depends on the validity of its three main assumptions. First, there is the issue of substantially increasing productivity through the provision of improved technology alone without fundamental changes to the existing institutional arrangement. Second, there is an assumption that regards the positive impacts of increased productivity and output on farm households' income without adversely affecting the prices of agricultural products. The third is the presumption that increased farm household income will lead to higher demand for domestically manufactured goods, leading to demand-driven industrialization. The validity of these assumptions is doubtful, given the overall performance of the agricultural sector. The absence of a significant average yield increase, despite greater use of fertilizers and improved inputs over the years, questions the validity of the first assumption. The experiences of the 1996/97 and 2001/02 crop seasons, when bumper crops led to a collapse in agricultural prices, question the validity of the second assumption. A collapse in agricultural prices, along with low smallholder expenditure on industrial products questions the validity of the third assumption.

Accordingly, critics argue that ADLI as an agriculture and overall development strategy is facing complex challenges as it did not give due attention to known problems and hindered the agricultural development of the country. A number of reasons, such as drought, war, pests, land tenure insecurity, population pressure, soil erosion, overgrazing, deforestation, lack of efficient rural institutions, stagnant technology, distorted economic policies, and weak institutional support, are usually given for the country's agricultural sector stagnation (Amha 2004:224-225; Shiferaw & Holden 2000:221). In view of this, the prominent contentious area in relation to this thesis is the issue of land tenure insecurity (see section 1.4). Admittedly, the poor performance of agriculture and the stagnation of farm productivity cannot be attributed wholly to land policy, but since tenure is a critical factor and since 'tenure insecurity is widespread and deep-seated, land policy must bear a high proportion of the blame' (Rahmato 2004:18). In addition, the assumption that agriculture could take the leading role of economic development without concomitant strategies for urban development is questioned (see EEA 2002: 25-26; IFPRI 2011:15-16).

Nonetheless, ADLI provided the guiding framework for two consecutive macro policy frameworks or poverty reduction strategy plans, namely the Sustainable Development and Poverty Reduction Program (SDPRP), which covered 2002/03–2004/05, and Plan for Accelerated and Sustained Development to End Poverty (PASDEP), which covered 2005/06–2009/10. ADLI was one of the four pillars of SDPRP, along with the justice system and civil service reform, decentralization, and empowerment and capacity building in public and private sectors. Additionally, SDPRP recognized that agricultural and rural development would not be rapid and sustainable unless complementary and simultaneous development initiatives were undertaken in non-agricultural sectors. In addition, PASDEP iterated the need to strengthen rural-urban linkages to reduce the negative impact of rural-urban migration, maximizing growth and its impact on poverty reduction. In fact, PASDEP continued to focus on the ADLI strategy, along with eight other pillars[59] designed to pursue accelerated and sustained growth in the planning period of 2005/06–2009/10.

The agricultural development strategies articulated in PASDEP have acknowledged these important contextual requisites:

- Maintain a coordinated development path where linkages among the various aspects of rural development activities and existing opportunities are fully utilized.
- Recognize the needs of different agro-ecological zones and thus differences in agricultural systems.
- Regard labour and land as the absolute endowments of the country requiring efficient utilization (see MoFED 2005:67-108).

[59] These pillars are building all-inclusive implementation capacity; a massive push to accelerate growth; creating the balance between economic development and population growth; unleashing the potentials of Ethiopia's women; strengthening the infrastructure backbone of the country; strengthening human resource development; managing risk and volatility; and creating employment opportunities.

The government has initiated various development programmes and strategies, such as the rural development strategy, poverty reduction programmes, and food security programmes to promote livelihood diversification and specialization, depending on local circumstances, which is boldly expressed in the document of Rural Development Policies and Strategies (RDPS).[60]

The RDPS package was introduced in 2001 to consolidate the aims of the ADLI strategy towards favouring smallholders. RDPS envisages that smallholder agriculture should be enhanced through the distribution of improved seeds, fertilizers, farm implements, and pesticides to farmers. In addition, it intends to address the proper use of farmlands, expanding rural infrastructure (health, education, access to safe water, and rural roads), improving smallholders' access to the rural financial system, and developing and strengthening rural institutions. In line with these, it has articulated strategies to provide improved extension services, construct small-scale irrigation schemes, minimize post-harvest losses, and develop livestock resources (see FDRE 2001; MoFED 2005). Nevertheless, critics contend that the RDPS package tries to address supply-side problems of the agricultural sector, but has paid less attention to the demand side, institutional issues, and the interaction of the rural and urban sectors (EEA 2002:24; Gete, Asfaw, Tolosa, Alemu & Trutmannl 2008:10; IFPRI 2011; Seid 2009:5).

The government has embarked on sets of actions to redress the depth of overall poverty and food insecurity through implementation of the Food Security Strategy (FSS) since 2002. This strategy addresses both the supply and the demand side of the food equation; that is, availability and entitlement, respectively, from both national- and household-level perspectives. The overall objective of the FSS is to ensure food security at household level, while ADLI focuses on creating the conditions for national food self-sufficiency. The food security strategy, which is a multi-sector one, touches on many policy areas, including land tenure and land use, rural credit and marketing systems (see FDRE 2002). Equally, various policy documents of the current regime underline the need to sustain micro-finance institutions to improve rural financial services; and support the expansion of service

[60] The current agricultural and rural polices in Ethiopia include the Rural Development Polices and Strategies (RDPS), Food Security Strategy, Food Security Program, Productive Safety Net Program, Participatory Demonstration and Training Extension System (PADETES), Sasakawa Global 2000, and National Extension Intervention Program (NEIP) (IFPRI 2011:16).

cooperatives, which are critical for providing input/output marketing services, rural financial services and off-farm employment and income through setting up small agro-processing enterprises (FDRE 2001:7; MoFED 2005:63). FSS acknowledged the productive safety net and resettlement programmes as important pillars to ensure food security at household level (discussed extensively in section 4.6).

In general, poverty reduction strategies in Ethiopia have relied on agricultural and rural development investments. This is because the overwhelming numbers of households derive their livelihoods from rural and agricultural activities. In addition, the evolution and status of development policies and plans of the current regime are good on paper and strong in rhetoric. It seems they follow an integrated approach to rural development and aim to link agricultural and industrial development. An overview of the development plans and strategies under the current regime is provided in Box 4.1 below.

Box 4.1 Inventory and present state development plans in Ethiopia

Rural Development Policies and Strategies (RDPS)

- Introduced in 2001 and consolidates the trust and ambitions reflected in ADLI
- Places a strong focus on smallholders
- Focuses on enhancing combination of capital and labour through the delivery of improved seeds, fertilizers, farm implements, and pesticides etc.
- Is involved in expanding rural infrastructure, institutions and financial system
- Criticized for treating rural and other sectors independent of each other

Food Security Strategy (FSS)

- Introduced in 2002
- Its overall objective is to ensure food security at household level, while ADLI focuses on creating the conditions for national food security
- It places clear emphasis on off-farm employment opportunities, technology transfer through agricultural extension and conservation of natural resources
- Resettlement and productive safety net programmes are also considered as relevant components of FSS

Sustainable development and Poverty Reduction Program (SDPRP)

- Macro policy framework for growth and development, effective from 2002/03-2004/05
- Recognizes agriculture's leading role in social and structural transformation of economy towards urbanization and industrialization, i.e. based in ADLI
- It does not pay adequate attention to non-agricultural sector, urban areas, markets, and demand side of production
- It doesn't address rural-urban migration substantially, and only in light of problems associated with migration

Plan for Accelerated and Sustained Development to End Poverty (PASDEP)

- Successor of SDPRP, effective from 2005/06-2009/10
- Also pursues Agricultural Development Led Industrialization (ADLI)
- It reiterates the need to strengthen rural-urban linkages; the document itemizes rural sectors that require investment (rural roads, telecom, general education and vocational training, small scale credit markets, rural electrification)
- Unlike SDPRP it embodies the urban development agenda, which is reflected on National Urban development Plan (NUDP)

Growth and Transformation Plan (GTP)

- Successor of PASDEP, effective from 2010/11-2014/15
- It concentrates on a locally driven economy and targets an economic growth of 14.9% per annum
- Maintains agriculture as a major source of economic growth but it want to create favourable conditions for the industry to play a key role in the economy; industry provides an expansion of infrastructure development (electricity production, railway lines and telephone infrastructure)

Source: Adapted from IFPRI 2011:34

Current agricultural and rural development policies have four strengths. First, the ADLI strategy is founded on natural and human capital endowments. The policy documents (see FDRE 2001; FDRE 2002; MoFED 2005) indicate that any policy should be based on the existing resource base and its efficient utilization. Thus, land and labour are asserted to be the endowments of the country, along with untapped natural resource bases. As the country is agrarian, the strategy gives due focus to intensive and extensive utilization of the land through improved labour-intensive technologies and practices.

Second, the ADLI strategy is strengthened by a range of sectoral policies and strategies that complement it (see FDRE 2001; MoFED 2005). The rolling five-year plans of the health and education[61] sectors, which have run for more than a decade, are meant to develop human capital. The development of socioeconomic infrastructures such as rural and urban electrification, the construction of roads, the installation of telecommunications lines, and increased attention to potable water supply are outlined in the sectoral policies. The outcome of each of these policies and strategies, however, is subject to future research and evaluation.

Third, a range of livelihood diversification measures are proposed in the policy documents. They point out that agricultural diversification strategies compatible with each agro-ecology will be developed and implemented. They add that efficient delivery of rural microfinance services and activities that foster rural marketing and linkage with agro-processing industries will be implemented (FDRE 2001; FDRE 2002; MoFED 2005).

Fourth, the policies maintain that fostering the democratization process is pivotal for the other policies. These include decentralization and devolving of power to the regions and *woreda*s, building their capacity to administer their own development; enhancing the role of the private sector, championing human rights, and allocating more space for civil society (see MoFED 2005).

However, one could observe interrelated major shortcomings from the implementation discourse of RDPS. Given the superficial public discussion forums that have been held on development policies and plans, centralized planning obscures citizen participation in development planning. In spite of the controversies over the timeliness and appropriateness of development policies and plans, low administrative capacity is observed to implement those policies and plans at grassroots level (Amha & Peck 2010:23; Rahmato 2009:194). The essence of ADLI strategy rests in the belief that the agricultural sector can serve as the driving force for the rest of the economy by generating surplus investable capital, creating demand for industrial products and supplying cheap labour force for the infant industrial sector. The assumption is that the non-competitive and technologically backward agricultural sector will grow and transfer capital to the industrial sector (see EEA 2002: 25-26; IFPRI 2011:15-16). Critics also maintain that because land is owned by the state, farmers are not willing to make

[61] The health and education sector development plans envision a time horizon of 20 years having a feature of long-term (perspective) planning that rolls at an interval of five years.

long-term investments to conserve and develop their main asset and, as a result, farmlands are continuously depleted, contributing to low production (see section 1.4). In addition, diversification from agriculture has not been given due emphasis in the implementation discourse of RDPS in the last decade. The resettlement programme is viewed by the government as a lasting solution to chronic hunger and food insecurity, and a way to meet the problem of land scarcity. However, resettlement[62] as a food security strategy is not well accepted by the poor, mainly because of lack of infrastructure in resettlement sites. Moreover, re-settlers are not provided with land tenure security. In the Ethiopian context, the right to use agricultural land is dependent on permanent residency in a rural area and engagement in agricultural pursuits (see sections 1.4 and 1.5). Section 4.5 examines the Ethiopian farming systems.

4.5 Ethiopian farming systems and associated land-use systems

The farming system model (section 3.3) articulates that all farming practices can be seen as technical, economic and social practices. This section discusses the four main farming systems of the country in which emphasis is given to the biophysical environment, land-use system, indigenous land management, and structure and constraints of farming systems.

Ethiopia is characterized by diverse topographic features, with an altitude range between 100 metres below sea level (mbsl) and 4620 metres above sea level (masl). The Dallol Depression or Kobar Sink is located in the Afar region, while Ras Dashen Mountain is in the Amhara region (Murison 2004:407). The largest share of the country's land falls under the 'lowlands', which constitute 55 per cent of the landmass, whereas the remaining area falls under the 'highlands'. The altitude level of 1500 masl is the demarcation line between the lowlands and the highlands (Beshah 2003:27; Shiferaw & Holden 1999). The highlands are divided in two by the Rift Valley, which runs from the northeast towards the southwest. More than 88 per cent of Ethiopia's human population and approximately 75 per cent of its livestock population live on the highlands, which are suitable for agricultural activities and human settlement (Shiferaw & Holden 1999:740). In contrast, Africa's highland zones are habitat for only 20 per cent of the continent's rural people and livestock population (McCann 1995:23). The

[62] Though resettlement was one of the unpopular policies of the Derg regime, the government initiated voluntary resettlement programme in 2003 in line to the FSS (Rahmato 2009:248).

Ethiopian highland zones constitute half of Africa's highland zones (Hurni 1988:124; McCann 1995:23) and account for 95 per cent of the cultivated land (Shiferaw & Holden 1999:739).

The diverse topographic features of the country are the result of volcanic action that created Ethiopia's highland soils and deep river gorges such as the Abay (Blue Nile) and Tekkaze in the north and the shallower Wabe Shebele Valley in the southeast. Other important river systems draining the highlands include the Awash, Gash, Gibe, Juba, and Didessa (McCann 1995:26; Murison 2004:407). The decomposition of the rich volcanic material that overlies the sedimentary base has created distinct Ethiopian soils that differ from the lateritic soils found widely in Africa (McCann 1995:26). In this geological process, approximately 18 soil-type associates have been created in Ethiopia (Beshah 2003:29). The major ones are lithosols, nitosols, cambisols, rogosols, vertisols, fluvisols, xerosols and aerisols. Among these nitosols, cambisols and vertisols account for 23 per cent, 19 per cent and 18 per cent of arable lands, respectively (Beshah 2003:29).

The rural development strategy of the country, that is, the RDPS document, divides the country into three agro-ecological zones and tailors response packages to the conditions of each zone. These are rain-sufficient areas[63], drought-prone highlands, and pastoralist lowlands (FDRE 2001). The classification of these official landscapes is based mainly on rainfall and elevation. Rainfall is generally higher in western than in the eastern Ethiopia (IFPR 2011). Annual rainfall averages range between 500 and 1700 millimetres per year (CSA 2004), 'but the rhythms of the seasons and long-term climatic patterns display considerable variation across the landscape from north to south and among topographic zones' (McCann 1995:28).

Four topographic zones are recognized in Ethiopia. These are Wurch (above 2900 masl), Dega (2500-2900 masl), Weyna Dega (1800 to 2400 masl), and Kola (below 1800 masl) (Beshah 2003:29; Murison 2004:407). The Ethiopian highlands constitute the first three topographic zones, the elevation in each zone creating one of the few consistent elements on the wide variation of highland environments. The agriculturally viable highlands range between 1500 and 3000 masl, with subtle, incremental shifts in characteristics of ground cover, crops and temperature as altitude rises and falls (Beshah 2003:28; McCann 1995:28; Shiferaw & Holden 1999). The greatest single determinant of climatic conditions and the terms of human

[63] According to IFPR (2011:7), the rain sufficient areas can be subdivided into the humid lowlands, the rain-sufficient highland cereal-dominant areas, and the rainfall-sufficient highland enset-based cropping systems.

habitation is thus elevation or the topographic zones of the country. This is reflected by the level of variation in temperature and rainfall quantity and distribution across the four topographic zones of the country.

The agricultural calendar of Ethiopia is largely a product of a distinctive climatic regime and patterns of variation within each topographic zone (McCann 1995:28). Based on the rainfall and temperature patterns across the four topographic zones, four traditional seasons are known in the country's agricultural calendar, namely Kiremt (Meher), Bega, Belg and Tseday. Kiremt is the wet season, in which long rains occur between June and August, and the main cropping season. Tseday is between September and November when soil moisture retained from Kiremt rains allow for crop planting. Bega is the dry season between December and February in which crop harvesting and threshing are conducted. Belg (between March and May) is a short rainy season in the north and central highlands, while it is the main cropping season for some areas in the south. The distribution of rain between Meher and Belg creates a bimodal rainfall pattern and crop-planting season (Amare 2002; Beshah 2003:29; McCann 1995:31).

From a biophysical perspective, the integrated forces of topography and climate determine the vegetation cover. Historically, 'vegetation and forest cover of Ethiopian highlands have varied from open grasslands or scattered wooded savannah in the central highlands, to moist evergreen montane forests in the southwest with dense forests of tall broadleaf hardwoods' (McCann 1995:36; see also Murison 2004:407). However, apart from the Wurch zone, which has high mountains and a few inaccessible areas, the rest of the country has changed to the present landscape because of the influence of human and livestock population (Beshah 2003:29; Nyssen 1997). The present landscape is dominated by bare land without vegetation cover and fragmented farm plots, characterized by rills and gullies.

Approximately 16 million hectares of land were utilized for agriculture in 2008. This land was operated by more than 13 million agricultural households and approximately 14 million holders. According to CSA (2008), a household is defined as agricultural when at least one member is engaged in growing crops or raising livestock, either alone or in combination with others. In contrast, a holder is defined as a person who has primary technical and economic responsibility for the holding and may operate the holding directly as an owner or manager. In terms of land use, approximately 79 per cent was allocated for crop production (72% for annual crops and 7% for perennial ones). The remaining portion was allocated for fallow (7%), and grazing land (10%), and the balance for woodland and other uses (CSA 2008). The average land holding sizes per household and holder were 1.18 and 1.5 hectares, respectively. Nonetheless, the average cropland area was 0.96 and 0.93 per household and holder, respectively (EEA 2009:58).

The interaction between biophysical and socioeconomic factors has resulted in four broad types of farming systems in Ethiopia. These are the seed farming complex, which corresponds to the food-grain producing regions of northern, eastern and western parts of the country; the enset[64] planting complex; shifting cultivation, which is practised by minorities living along the western border of the country; and the pastoral complex (Westphal 1975, in Beshah 2003:33; Rahmato 2009:29). Though the farming systems of the country vary markedly according to altitude, soil, climate, and cultural tradition, the farming community shares a common technology (ox plough), a mix of annual cereal crops, and agronomic techniques to adapt these to local conditions (Arndt et al 2011; McCann 1995).

Picture 4.1 An Ethiopian farmer cultivating his land using ox-plough technology

Picture 4.2 Food grain threshing in Ethiopia

The country's farming systems commonly use the *marasha*, or plough, which is drawn by a yoke of pair oxen (Kebede 2002; McCann 1995). This technology is used because of its simplicity and efficiency (see Picture 4.1 above). It consists of eight basic parts, all available locally: the beam *(mofer),* the ploughshare *(marasha lit),* the sheath *(wogal),* the stilt *(erf),* two wooden ears *(sg diggir)* inserted into the ploughshare's sheath, a yoke *(qanbar),* and a leather strap *(mangacha),* which adjusts the ploughing depth (McCann 1995:45). Over time, farmers

[64] Enset *(Ensete ventricosum)* is a large, fibrous plant with distinctive long banana leaves, whose root (corm) and pseudo stems, rather than its fruit, provide its food value when prepared as a starchy edible paste made into a bread *(qocho)*. Enset is usually known as 'false banana'.

have adjusted the *marasha* for local field conditions and ploughing depth, soil conditions, and local variations in the use of livestock.[65] Though the plough's weight may vary between 13 and 20 kilograms by region and individual design, in every case its simple, efficient design allows farmers to carry it between the fields and home daily (McCann 1995:46).

Ox-plough cultivation across the four farming systems of the country has historically used supplementary hand tools (McCann 1995:46). In addition, agronomic[66] practises of smallholders have innovated, adapted, and evolved an array of cultigens that are synchronized with local field conditions and variations of climate, soils, and culture. Crop regimes thus vary considerably by region, reflecting altitude, soil, and local socioeconomic tradition (Beshah 2003:33; McCann 1995:51).

The major crops are teff, eleusine, chickpeas, barley, wheat, sorghum, and oil seeds. Vegetables, herbs, and spices are grown in homestead gardens as condiments to complement basic farm diets of cereals and pulses. Root crops, such as *godare* (taro), *boye* (yam), *oromo dinich (Coleus edulis)*, Irish potato and sweet potato are also cultivated (IFPRI 2011; McCann 1995:52). Though each has its own characteristics, root crops often compensate for gaps in the annual food calendar of most rural areas, particularly in the months of April through June (EEA 2011). Indeed, root crops are an important staple food in southern and western Ethiopia (EEA 2011; McCann 1995).

Of all the food grains cultivated by smallholders, teff *(Eragrostis* teff*)* is an elite staple cereal that appears as a primary food crop in the central and northern highlands.[67] It is the primary ingredient of *enjera,* a thin and fermented bread. Teff cultivation ranges between 1700 and 2200 masl, and is the most labour-intensive crop in seed farming (Kebede 2002; McCann 1995:55). Teff requires intensely prepared seedbeds and heavy labour in weeding (Rahmato 2009). In addition, as perhaps the world's smallest grain, it requires great care in harvest and threshing (McCann 1995:55). On the other hand, teff is a prestige cereal food, yielding the highest exchange value and the longest storage period. It also yields the best building straw and most digestible cattle fodder, and is somewhat drought resistant (Kebede 2002; McCann 1995:55). Ethiopians eat teff only as *enjera,* and value it most highly in its *manya,* or whitest,

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[65] Oxen dominate as the draught animal of choice, but on rare occasions, horses and cows replace oxen.
[66] Agronomic practices refer to crop production and soil management knowledge of smallholders.
[67] Though its domestication from the wild *Eragrostis* genus took place in Ethiopia, wild *Eragrostis* remains have appeared in Egyptian pyramid bricks and as wild pasture grass in both hemispheres (McCann 1995).

variety. Red *(qay)*, black *(tiqur)* varieties, and mixed-seed *(sergegnya)* harvests are more common. In recent times, teff's high price and prestige have made it the only crop amenable to commercialization and specialization in the seed farming complex (Kebede 2002; McCann 1995:55-56).

Perennial or multiyear crops such as coffee, chat *(Catha edulis),* yams, and enset are found almost exclusively on the southern periphery, where horticultural traditions and more consistent soil moisture allow local farms to retain perennial tree crops. Perennial crops not only provide diet supplements, non-alcoholic stimulants, and market income for farm households, but also retain soil moisture and fertility. Coffee, until the early twentieth century, was not a cultivated crop, but a natural forest product gathered in the southwestern moist montane forest in the altitude range of 1800-2200 masl. Similarly, the perennial tuber enset *(Ensete ventricosum)* or 'false banana' grows wild elsewhere in East Africa, but in Ethiopia it is a cultivated food crop. Cultivators propagate enset vegetatively, though its seeds are virtually sterile. Enset plants grow together thickly and through vegetative propagation, 500, 700 and sometimes 1000 grow from a single tree. Some call this plant 'tree of the poor', even though wealthy people avail themselves of it as a delicacy, while others call it 'tree against hunger' since anyone who has one of these trees is not afraid of hunger (McCann 1995:53).

Farmers have adopted various indigenous soil management techniques to control soil fertility and moisture and to minimize effects of climatic intrusions (such as frost, waterlogging, and drought) in the Ethiopian farming systems. 'These practices have responded to an almost infinite variety of conditions, localized down to shades of difference between microclimates, valleys, and even soil conditions and the slope of individual plots' (McCann 1995:56). At its most basic level, farmers cultivate cereals and pulses alternatively in a short-fallow rotation to balance and retain soil nutrients, particularly nitrogen (Omiti et al 1999; Pender & Gebremedhin 2007). Local rotation practice, however, varies considerably according to elevation, soil conditions, and the exigencies of individual farms (McCann 1995:57; Omiti et al 1999). Rotation and fallowing sustain soil fertility by fixing nitrogen through planting pulses and natural regeneration of organic matter back into fields. Rotation also breaks the reproduction cycle of crop-specific pests. Though crop rotation is practised widely, the custom of fallowing has virtually been eliminated in many parts of the country because of population pressure and associated scarcity of land (McCann 1995:57; Pender & Gebremedhin 2007; Shiferaw & Holden 1999).

Across the country, farmers use manure to various degrees to retain soil fertility, but primarily for their household garden crops. In addition, the practice of open grazing, which allows animals to graze post-harvest crop residue, usually leaves limited deposits of manure on farmlands (McCann 1995). Women often collect manure from farm plots to use as household fuel rather than fertilizer. Dung and crop residues provide up to 50 per cent of the household energy supply in rural Ethiopia (Shiferaw & Holden 1999). Accordingly, higher opportunity costs of dung and crop residues for fuel and livestock feed divert their traditional use for retaining soil fertility (Omiti et al 1999; Pender & Gebremedhin 2007; Shiferaw & Holden 1999).

Farmers usually leave stones[68] on the surface of farmlands, based on their indigenous knowledge of the benefits of stones in retaining soil moisture and preventing soil runoff during heavy rains. In addition, farmers control drainage and soil erosion through contour ploughing and drainage furrows. On plots with a slope of 10 degrees or more, farmers plough along the contour with subsequent intersecting furrows on or just off the contour. Where flooding is likely, farmers plough drainage furrows at three- to seven-metre intervals after seed germination (Beshah 2003:35; McCann 1995:58; Pender & Gebremedhin 2007).

Across the Ethiopian Highlands, where rainfed agriculture is dominant, irrigation has historically consisted of small-scale use of gravity-fed rivulets captured from small streams or springs. Wherever highland smallholders have engaged in irrigation, they have built terraces (McCann 1995:60). These vary widely in terms of their width and design (Beshah 2003). They also appear to vary in the forms of labour used to construct and maintain them, which depend on the resources of households and characteristics of the plot (McCann 1995; Omiti et al 1999; Shiferaw & Holden 1999). Nevertheless, the primary purpose of constructing these terraces is under some debate among scholars. Some argue that farmers built highland terraces for moisture retention, not to prevent erosion. Others contend the opposite (Beshah 2003:57; McCann 1995; Omiti et al 1999).

[68] Stones cover as much as 20 to 25 per cent of the soil surface in some areas (McCann 1995:58).

In Ethiopia, farmers claim that traditional practices have higher net yields than modern conservation technologies introduced in their locality (Beshah 2003; Shiferaw & Holden 1999). Apart from the loss of productive land, farmers often complain that modern conservation technologies have drawbacks associated with working inconvenience, waterlogging and pest problems (Beshah 2003; Shiferaw & Holden 1999). Other impediments include lack of labour to make terraces, destruction of soil conservation structures by livestock, especially during the post-harvest period, and the decisions of upstream households not to take restorative measures (Omiti et al 1999).

The Ministry of Agriculture's Woody Biomass Inventory and Strategic Planning Project (WBISPP) updated Westphal's (1975) classification of the Ethiopian farming system. According to WBISPP (2001), the land-use system in the diverse context of Ethiopian smallholder farming system can be subdivided into four. These are cereal land-use systems; enset farming land-use systems; woody fallow cultivation land-use systems; and livestock production land-use systems. Each land-use system is discussed briefly in the subsequent subsections.

4.5.1 Cereal land-use systems

Cereal land-use systems are broadly classified as those:

- In the Bale-Arsi highlands
- On vertisols in the central highlands
- On non-vertisols in the central highlands
- In central Rift Valley in east Shewa zone
- In the eastern and southern lowlands
- In the Harerge highlands (WBISPP 2001)

The distinguishing feature of cereal land use systems is that nearly all crops are produced from seed. The crops are mainly cereals, pulses and oil crops, with root crops generally being of minor importance. Perennial crops, such as coffee, chat and *gesho*[69] are important in some systems. The degree of integration between crops, livestock and trees varies between systems.

[69] *Gesho (Rhamnus prinoides)* is an evergreen shrub or small tree whose leaves are used as a flavouring ingredient for the local beer *(tella)*.

Nevertheless, livestock play many roles in such systems, for example as a store of wealth, draught power, dung fuel, manure, food and transport.

4.5.2 Enset land-use systems

The enset land-use system comprises two land-use systems because of considerable variation in the importance of enset as a staple food, compared with other tubers and root crops, and cereals. This varies from one extreme, in which enset is virtually the only food crop to the almost total exclusion of cereals, to the other, in which enset is a minor food source and cereals a major one. Enset land-use systems are thus classified as those in which enset is co-dominant with cereals; and those in which cereals are the dominant staple, and enset and root crops are minor (WBISPP 2001).

4.5.3 Woody fallow cultivation land-use systems

The woody fallow cultivation land-use system consists of the cultivation of annual crops along with some sedentary livestock. A continuum exists between the shifting cultivation systems with long, medium, short (1 to 2 years) fallow periods and the sedentary agricultural systems. Shifting cultivation is practised with bush fallowing of varying periods. This system is found in the river valleys of the Abay, Gojeb, Ghibe and Didessa rivers in which soils are leached (acrisols and nitosols) with low inherent fertility. In these river valleys, shifting cultivation is temporarily adventitious for highland farmers. Sorghum, maize and finger millet are planted as a mix in the main fields, and undersown with beans, pumpkin, gourds and cabbage. Sesame, cotton and ginger are planted alone in separate fields. In the household garden, sorghum, cabbage, pumpkin, gourds, yam, maize, peas and beans are usually intercropped (WBISPP 2001).

4.5.4 Livestock production land-use systems

Livestock production comprises extensive pastoral systems, semi-extensive agro-pastoral systems, and intensive mixed cropping and livestock systems in the highlands. An extensive pastoral system is characterized by a distinct socio-cultural identity, based on ethnic group, language and territorial grazing area. Livestock herd composition, grazing management, and herd movements are determined largely by seasonal patterns of rainfall and water sources.

Crops are not grown in the extensive pastoral system, although grain purchased through the sale or exchange of animals is an important component of the pastoral diet (Berhanu & Colman 2007). Inter-annual forage production is highly variable, and livestock numbers can fluctuate considerably with cyclical population 'crashes'. Although total numbers can recover over time, repeated droughts over the past three decades, combined with increase in human population, have resulted in a reduced number of livestock per family (WBISPP 2001). Consequently, increasing numbers of pastoralists have been resorting to crop cultivation in recent years (Berhanu & Colman 2007).

The semi-extensive agro-pastoral system is characterized by a mix of former pastoralists who have taken up various forms of small-scale crop production, as well as maintaining a less extensive form of pastoral livestock production, and former agro-pastoralists who have lost their livestock and have become dependent largely on crop production (WBISPP 2001). The intensive mixed cropping and livestock systems in the highlands are characterized by varying degrees of crop-livestock integration, including the use of crop residues, draught power and manure. Cattle are reared for a variety of purposes, including milk and meat products, and breeding and sale of surplus animals as work oxen or for slaughter. With human population growth, agricultural expansion and the widespread conversion of former grazing areas to crop land, crop residues have become increasingly important, both as feed for farmers' own animals and as a commodity to sell to livestock owners. Valley bottoms in particular are subject to increasing competition, with strict rules of grazing management. The gathering and storage of hay have also become increasingly widespread activities (WBISPP 2001).

Overall, the diversity of land-use systems in the Ethiopian agriculture is matched by the diversity of agricultural systems. The development of agriculture has followed various patterns. In some regions, mixed crop and livestock production is practised, while in others a pastoral system dominates. Given the diversity of agricultural production and livelihood strategies in the Ethiopian farming systems, an attempt is made to provide an overall picture of household assets and livelihood strategies in rural Ethiopia.

4.6 Livelihood assets and strategies in rural Ethiopia

Ethiopia is home to a predominantly agrarian society. In this subsistence-oriented rural economy, access to assets that are the basis of agricultural production largely determines households' economic status and livelihood security (Amare 2002; Massow 2000). Control of productive assets such as land, draught power and other livestock is vital for approximately 91 per cent of the productive labour force in the country because agriculture is the mainstay of rural livelihoods (EEA 2009). Though non-agricultural income may serve as a means of fulfilling the deficits of the agricultural sector, the current middle-term development plan of the country (GTP) underscores that agriculture is a major source of economic growth (see Box 4.1 above). Accordingly, this section examines the productive asset holdings of rural households in light of the SLF conceptualization of livelihood asset in Diagram 3.1. This endeavour puts emphasis on examining the livelihood strategies of rural households, given their productive asset endowments.

4.6.1 Human capital

DFID (2001) defines human capital as 'the skills, knowledge, ability to labour and good health important to the ability to pursue different livelihood strategies'. In view of this, the human capital of the country is discussed in this section, using indicators of the status of food security, coverage of primary health and education services, and the dependency ratio.

Status of food security

The policy and investment framework for the coming ten years (MoARD 2010) reports that in Ethiopia, the food poverty head-count decreased from 44 per cent in 1999/00 to 38 per cent in 2005/06 and was expected to be 28 per cent in 2009/10. The per-capita grain production increased from below 1.5 quintals in 2003/04 to 2.13 quintals in 2007/08. This meant that the country is almost meeting the 2100 Kcal per-capita-per-day requirement, the equivalent of which in terms of production is 2.16 quintals (EEA 2011:42). However, food self-sufficiency has not yet been achieved at national level, as there are parts of the country where people are vulnerable to shocks that lead to food insecurity, while others who have problems of chronic[70] food shortages.

Records show that in the worst crop production year, up to fifteen million people in the drought-prone areas of the country could face food shortages, which are chronic or transitory in nature (MoFED 2005). The cause of chronic food shortages is structural, while transitory

[70] The government defined chronic food insecurity as a state of food aid recipient for three consecutive years over a ten-year period considered between 1994 and 2004.

shortages are usually triggered by short-term emergency situations. Chronic food insecurity reflects loss of capacity to produce or buy enough to meet annual food needs, even under normal weather and market conditions. Transitory food insecurity, on the other hand, reflects weak resilience to shocks in times of severe droughts. Food price is also an important aspect of food security. Food inflation was a single digit around 2004 and gradually rose to double digits in 2005, reaching 50 per cent in September 2008, and 60 per cent in February 2009, before it dropped to 20 per cent in September 2009 (EEA 2011:47).

To curb food insecurity, the government, in close collaboration with its development partners, developed the Food Security Program (FSP) within the framework of a wider five-year plan known as PASDEP (see section 4.4 above). The core objectives of the programme are twofold: to enable the 8.29 million chronically food insecure population to attain food security within a five-year period; and to improve significantly the food security situation of the remaining 6.71 million people facing transitory food insecurity problems (MoFED 2005). The FSP has three major components, namely the Productive Safety Net Program (PSNP), the Other Food Security Programs[71] and Resettlement (Teshome 2010).

The PSNP is intended to serve the dual purpose of helping bridge the income gap for chronically food insecure households, and engaging such households in community asset-building efforts to earn income, especially during the lean season and times of drought. It thus has two broad objectives: i) to prevent the asset depletion at household level, and ii) to create assets at community level. The first objective is to be achieved through timely transfer of food or cash or both, in order to stop households from selling their assets when they go hungry. The second objective is to be achieved through household participation in public works (Teshome 2010). Public work participants are able-bodied men and women who are required to make a labour contribution to community asset-building schemes such as the construction of roads, terraces and water ponds.

The PSNP is designed to target chronically food insecure people that reside in 287 *woreda*s (MoFED 2005). In the past five years the PSNP, which is known as one of the largest social protection programmes in sub-Saharan Africa, has covered 7.57 million people, who live in

[71] Other food security programmes include access to credit, agricultural extension, technology transfer (such as advice on food crop production, cash cropping, livestock production and soil & water conservation), irrigation and water harvesting techniques.

290 rural *woredas* (EEA 2011:43).[72] The second phase of the programme has been initiated to operate for another five years, covering 2010 to 2014. Like its predecessor, it has two components: labour-intensive public works, and direct support for labour-poor households. The able-bodied are engaged in public works for which they are paid a minimum amount, while the labour-poor are provided the same amount free.

Broadly speaking, two underlying principles have guided the implementation of FSP in the past five years: helping farmers to use their own resources to overcome food insecurity, and a shift away from dependence on food aid. The key interventions articulated on PASDEP to attain household food security over the five-year period were i) building household assets through on-farm activities; ii) supporting voluntary resettlement to more productive areas; iii) a safety net program, which helps bridge food gaps while building community assets; and iv) non-farm activities (MoFED 2005). Nonetheless, the low level of human capital exhibited in low literacy rates, non-diversified skills, and lower access to health facilities is working against households' ability, capability and choice of diverse livelihood strategies in the implementation discourse of FSP.

Coverage of primary health services

In Ethiopia, primary health service coverage, through the development of health infrastructures and facilities, has shown significant expansion in recent days (see EEA 2009; EEA 2011). However, utilization of the health facilities is reported to be markedly different from household to household and is generally low. Health service utilization[73] in urban and rural areas was 14 and 9.5 per cent, respectively (Minas 2001). This means that effective utilization of health facilities depends on demand side factors such as education, information, income and other socioeconomic characteristics of intended users. Accordingly, the status of health outcome indicators shows that Ethiopia is among the lowest in the world. Life expectancy at birth is low; infant mortality and maternal mortality rates are high. The burden of disease, measured by premature death, is dominated by prenatal and maternal conditions, acute respiratory infections, malaria, nutritional deficiency, diarrhoea and AIDS (EEA 2011). Indeed, the percentage of fully immunized children increased from 22 per cent to 63 per cent

[72] The programme is considered the largest of its kind in Africa. It has had about 8 million beneficiaries (approximately 7 million in public works and 1 million in direct support) followed by the child support programme of South Africa that has 3.7 million beneficiaries (Teshome 2010).

[73] Massow (2000) notes that absence of affordable nearby clinics limits women's choice to home-based or traditional treatments and birth attendants.

between 1999/00 and 2007/08. In this period, the infant mortality rate decreased from 110 to 77 deaths per 1000 live births (EEA 2009).

Coverage of primary education services

Ethiopian literacy level was 37.91 per cent in 2004, with 26.61 per cent in rural areas and 68.48 per cent in urban areas (CSA 2004). However, there has been a paramount growth in enrolments at all levels of education throughout the country since the Millennium Declaration. Access to education is commonly measured by the gross enrolment ratio (GER), which is defined as the ratio of all enrolled students to the population in the official age range for that cycle. The data obtained from Ministry of Education (MoE) annual abstracts reveal that the country achieved over 40 percentage points increase in primary GER between 2000 and 2009 (EEA 2011:127). This is composed of an increase of approximately 50 and 37 percentage points in female and male primary enrolment ratios, respectively. The GER in primary schools (Grade 1-8) was 94 per cent (98 % for male and 91% for female) in 2008/09 academic year (EEA 2011:127). This means that the country has almost achieved universal primary education in line with the MDG targets.

However, achievements in expanding access to primary education have not been accompanied by adequate improvements in quality. For instance, the National Learning Assessment (NLA) (in EEA 2011:145) reveals that the composite scores in Grade 4 and 8 have declined to 41% and 37%, respectively, in 2007 compared with the corresponding scores of 48% and 41% during 1999/00, the baseline assessment period. In addition, the high dropout rate (14.6% in 2009) and repetition rate (6.7% in 2009) led to inefficient use of the country's scarce resources (EEA 2011:134-154). The level of poverty and hunger is the cause of low school attendance (Massow 2000). According to Hanjra et al (2009), primary school completion rate, gender parity ratio in school enrolments, and adult literacy rate were 55, 73, and 61 per cent, respectively. Thus, the country's literacy, women's inequality, regional disparity of access to education, educational quality and efficiency are below the average of other sub-Saharan countries (EEA 2011).[74] Moreover, 'existing healthcare and education facilities are under-resourced' (Massow 2000:48) since there is a shortage of qualified staff, inadequate supplies of the most commonly needed inputs, and a shortage of water and electricity in these facilities.

[74] The Human Development Index, which measures the standard of health and education along with PCI, of Ethiopia was 0.367 compared with 0.515 for sub-Saharan Africa (UNDP 2005, in EEA 2011).

Dependency ratio

The distribution of the human population in Ethiopia, by broad age groups shows that the proportion of young population under age 15 declined from 49.8 per cent in 1984 to 45.0 per cent in 2007. Conversely, the proportion of the population in the working age group 15-64 increased from 50.2 per cent in 1984 to 51.9 per cent in 2007 (FDRE-PCC 2008:12). However, it was estimated that the absolute growth rate of the working age population would decline from the 3.3 per cent recorded in the five years up to 2000 towards 2.8 per cent by 2010 (Minas 2001:120). The proportion of the population aged 65 years and over was 3.4 per cent in 1984 and remained constant at 3.2 per cent in both the 1994 and 2007 censuses (FDRE-PCC 2008:12).

Based on the 2007 census data (FDRE-PCC 2008:24-25), the young age dependency ratio is computed as 86.76 per cent, and that of the old age dependency ratio is 6.07 per cent, which makes the societal dependency ratio at 92.84. This simply shows that there are around 93 persons in the dependent ages for every 100 persons of working age. However, the societal dependency ratio is computed as 102.56, which shows that there are around 103 persons in the dependent age groups for every 100 persons of working age in rural Ethiopia.

Hanjra et al (2009) conclude that smallholders in Ethiopia remain poor because of small land holdings, large family size, high dependence on agriculture, illiteracy, low education and poor health, poor access to infrastructure and markets, and low use of modern agricultural inputs and farm credit. The next section examines the physical capital of the country.

4.6.2 Physical capital

DFID (2001) defines physical capital as ‘the basic infrastructure (transport, shelter, water, energy and communications) and the production equipment and means that enable people to pursue livelihoods’. Accordingly, proxy indicators such as access to the road network, telephone services, water services, improved seed varieties, and ownership of farm implements are used here to examine the status of physical capital.

Infrastructural services in Ethiopia are the lowest in the world, though there have been improvements at national level in recent years. The total road density increased from 29,571 km in 2000 to 42, 942 in 2007 (Endale 2011). Only 12 per cent of the road network is paved, and road density remains one of the lowest in Africa (30 km road/km^2 land, cf African average 50 km) (Amha & Peck 2010; EEA 2011:226). Given the country's large area, this lower road network reflects the lack of integration of producers of agricultural products with markets and towns. Approximately 70 per cent of the population have no access to all-weather roads as they live more than 20 km from such infrastructures (EEA 2011:226).

Mainline telephone (per 1000 people) was only 6.34 in 2003; whereas the comparable figures of neighbouring Kenya, sub-Saharan Africa and low-income countries in the same period were 10.03, 15, and 27, respectively (Endale 2011). This index has improved towards 10 in 2008 because of a deliberate move by government to expand access to wireless telephone for most rural households. Currently, the mainline telephone penetration in Ethiopia, 1.1 per 100 population, is relatively better than Kenya (0.7), Uganda (0.5) and Tanzania (0.3) (EEA 2011:226). Nonetheless, the mobile penetration is very low compared with other African countries. Subscription per 100 population is 7.1 per cent in Ethiopia, compared with 49.2% in Kenya, 40.2% in Tanzania, 35.8% in Uganda and 100.1% in South Africa (EEA 2011:226).

The availability of water for irrigation and drinking has been a problem in rural Ethiopia. Virtually all food crops come from rainfed agriculture with the irrigation sub-sector accounting for only approximately 3 per cent of agricultural lands (FAO 2008, in Dessie, Solomon & Tekle 2011:208; Devi et al 2007). The irrigation sub-sector is mainly used for commercial agriculture that neglects the production of staple food crops (FAO 2010). Food crops are produced by smallholders within a bimodal rainfall pattern; the minor rains of Belg[75] and the major rains of Meher.[76] The Meher season contributes for over 90 per cent of annual crop production (EEA 2009). Variability in quantitative and temporal distribution of both Belg and Meher rains results in crop failures, in spite of accessible rivers and lakes. Only approximately 13 per cent of potentially irrigable land[77] is developed (Arndt et al 2011). Water harvesting techniques are limited to the use of ponds for livestock drinking during the dry season (Beshah 2003:35). Approximately 37 per cent of rural households drink unprotected well or spring water while rivers, lakes and ponds serve as sources of drinking water for 30 per cent of rural households (FDRE-PCC 2008:741). These statistics reveal that persistent poverty and lack of resources affect water resource management and sanitation

[75] Belg brings short rains from January to May, which allow an additional cropping season.
[76] Meher brings long rains from June to September, which is the main cropping season.
[77] The potentially irrigable land is about 3.7 million hectares (Hanjra et al 2009).

(Massow 2000). On the other hand, rainfed agriculture is the backbone of the country's economy and rural livelihoods.

In addition, deficient infrastructure and high marketing costs reduce profitability of agricultural technologies for smallholders and impede technological change (Jayne, Govereh, Danzala & Demeke 2003; Omiti et al 1999).[78] To date, the area of cultivated land under improved seeds is at best less than 10 per cent of the total crops planted (EEA 2011:59). Only 3 per cent of farmers use improved seeds; 8 per cent use pesticides; and 39 per cent use chemical fertilizer (Adenew 2006). There is also a wide gap between actual yields and potential yields that could be bridged with improved technologies (Hanjra et al 2009). The major reasons cited for the low use of inorganic fertilisers include lack of purchasing power, non-availability of fertiliser at planting time, and unpredictable weather (Omiti et al 1999). In contrast, the country is endowed with a sufficient amount of essential elements such as compost and vermicompost, poultry manure and biopesticides for organic farming (Devi et al 2007). Organic farming was found to be 40.6 per cent more economical than inorganic farming[79] and maintains soil fertility and its integrity in a sustainable manner (Devi et al 2007). The inhibiting factors to organic farming are lack of alternative fuel for cooking and lack of labour to manage its cumbersome tasks (Omiti et al 1999). The adoption of both organic and inorganic farming might be restrained because of tenure insecurity that may indirectly decrease the returns to the farmer, given the deficient infrastructure and explicit production costs. Formal credit is available only for short-term loans for fertilizer, while long-term loans for investment in sustainable land management practices and purchase of farm implements are lacking (Shiferaw & Holden 2000).

In rural Ethiopia, a significant number of households still do not possess the basic tools that are vital for subsistence agriculture. The 2004 Welfare Monitoring Survey shows that approximately 60 per cent of rural households owned ploughing tools (ox-plough set, sickle and axe), which means that 40 per cent of households did not own these basic farming tools (CSA 2004:63). The survey also shows that the proportion of households who own an ox-plough set was around 66 per cent in 1996 and decreased slightly in subsequent years towards

[78] About 70 % of Ethiopian farmers live more than half a day's walk away from an all-weather road; grain prices received at farm gate are 30-70 % less than the market prices in nearby towns across regions; and marketing costs account for nearly half of the fertilizer prices paid by farmers (Jayne et al 2003), or about 15% of the value of agricultural output (Seyoum & Ferede 2004, in Hanjra et al 2009:1597).
[79] 'Inorganic farming' refers to the use of chemical fertilizers and chemical pesticides made available by the agricultural extension package.

a level of 60 per cent in 2004. Likewise, the proportion of households owning cattle and equine animals is decreasing slightly, while that of sheep and goats is rising over time in rural areas. Nonetheless, approximately 68 per cent of rural households own cattle, 58 per cent own poultry, 49 per cent possess sheep or goats and 24 per cent own equine animals (CSA 2004:63). A single household is probably required to have 10 head of cattle (two oxen, two young 'apprentice' bulls, a stud bull, and four or five milk cows) to sustain its farming practice using an ox-plough technology (McCann 1995:48). Empirical works (eg Berhanu & Colman 2007; Kebede 2002) contend that the cattle population of the country is decreasing because of disease and shortage of grazing lands.

Moreover, ownership of other producer goods differs across households in rural Ethiopia. The vulnerable and destitute are those who do not own either oxen or land (Amare 2002:27; McCann 1995:34). Indeed, widows, families with a sick family member, and those with too many small children could be considered vulnerable and destitute (Amare 2002; Massow 2000). Unless households own oxen or have access to them, land has little economic meaning (Kebede 2002; Massow 2000; McCann 1995). These households will eventually be forced to enter into unfavourable sharecropping arrangements (Amare 2002; Gavian & Ehui 1999; EEA 2002; Kebede 2002; Massow 2000; McCann 1995; Pender & Fafchamps 2005). The sharecropping arrangement undoubtedly restrains the adoption of new technologies (EEA 2002; Ellis 1980). Empirical studies found that total labour and oxen used per hectare were lower on sharecropped fields than other fields (Gavian & Ehui 1999; Pender & Fafchamps 2005). The misfortune of vulnerable and destitute households is reinforced when natural calamities affect crop yields, as their debt could be postponed to the next farming season (Amare 2002).

In rural Ethiopia, resource-poor households often borrow cash from relatively rich households to purchase livestock, improved seed, fertilizer, foodstuffs and to cover medical expenses. These debt relationships between agricultural households have formed the basis of the rural class since they reflect relative control and ownership of productive assets, particularly ownership of an ox-plough set[80] and land (McCann 1995:78). Ownership of productive assets

[80] The role of oxen ownership in determining the inter-household debt relationship resides partly in its adaptability but more fundamentally in its clear savings to labour over hand tillage. Field studies from Burkina Faso, which compared hand tillage to an ox-drawn plow, suggest dramatic advantages to the plow. Compared with hand tillage ox plows required 31 per cent less labour time per hectare with 16.7 per cent higher yields for

among rural households thus structures relations within rural communities and economies by distinguishing potential lenders and borrowers (McCann 1995). It reinforces intrahousehold allocation of scarce resources on child education and female nutrition, morbidity, and, ultimately, mortality (Massow 2000). Moreover, shortage of producer goods and lack of access and utilization of infrastructures and services impede opportunities of diversification and sustainable livelihoods in rural Ethiopia. This reinforces 'the pre-eminent importance of land as a source of livelihood and a key asset' (Deininger et al 2008:1790), which is extensively used to expand agricultural production even to ecologically fragile areas at the expense of future uses and generations (EEA 2002:26).

4.6.3 Financial capital

Financial capital means 'the financial resources that are available to people (whether savings, supplies of credit or regular remittances or pensions) which provide them with different livelihood options' (DFID 2001). Financial capital is instrumental in diversifying and expanding livelihood activities mainly because of its convertibility to various forms of assets and land-related investment. However, the present dearth of formal financial institutions and underdeveloped infrastructure[81] makes use of debt and credit transfer payment instruments difficult. In the absence of cheques and electronic payments (debt, credit card, and wire transfers) in rural Ethiopia, cash is the most used payment instrument (EEA 2011:227).

Cash income for household financial requirement in rural Ethiopia is generated mainly from the sale of livestock and crop products (Bekele & Drake 2003). Almost 91 per cent of economically active labour force is employed in agriculture and agriculture-related primary activities such as crop-production, livestock rearing, hunting and fishing (EEA 2009). The implication is that non-agricultural activities accounted for only 9 per cent of the rural employment. This should not be confused with participation rates, however. The number of households that took part in off-farm employments is expected to be far higher than this figure. Gebreselassie (2009), for instance, shows that 26 and 16 per cent of rural households participated in off-farm wage and self-employments, respectively. Similarly, a study by Rijkers et al (2009) indicates that approximately 25 per cent of all households in rural Ethiopia own one or more non-farm enterprises. Despite this relatively high participation rate, only

sorghum; also, the plow was shown to increase yields more than 200 per cent on fertilized plots whereas fertilizer had less than half that effect on hand-tilled plots (McCann 1995:47).

[81] Poor communication and physical infrastructure in Ethiopia increase transaction costs and limits access to financial services (Amha & Peck 2010; EEA 2011).

approximately 2 per cent of all households rely exclusively on non-farm enterprise activities (Rijkers et al 2009, in EEA 2009:74).

Non-farm activities could be considered as a secondary source of cash income for households in rural Ethiopia (Pender & Gebremedhin 2007). Wage or labour employments constituted 62 per cent of all reported non-farm employments, while the balance of 38 per cent was the share of self-employment (Gebreselassie 2009). Most of these non-farm activities are conducted in the village where farm households reside while only 16 per cent of the non-farm activities are located outside one's own village. This reflects the fact that the majority of non-farm employments could not provide an incentive to migrate or work outside one's own village or home. Children between 8 and 18 years old account for approximately 64 per cent of all non-farm employment that shows that poverty competes with children's school time (EEA 2009:80-83).

Over 80 per cent of farmers engaged in non-farm wage employments and over 70 per cent of those who own and run small non-farm enterprise spent their income on food.[82] Only approximately 8, 3 and 5 per cent of the sampled households reported that they spend their non-farm income on farm inputs, in small businesses or enterprises and on child education or health, respectively (EEA 2009:80-81). This pattern of expenditure highlights two points: first, the presence of a minimal level of productive linkage between farm and non-farm employments, and, second, agriculture is unable to provide the subsistence food requirements for those who diversified their livelihood into non-farm employments.

Formal financial services have a dual role in the development of non-farm enterprises, efficient utilization of resources and livelihood diversification in rural Ethiopia, by mobilizing savings and providing credit services. However, financial service coverage by formal banks in the country is far below international and African standards. It stands at approximately 134,670 people per branch, while the comparable figures for Ghana, Uganda and Namibia are 54,000, 130,000 and 11,136 people per branch, respectively (EEA 2011:209). Additionally, more than 52 per cent of Ethiopian bank branches are located in eight major towns, where only 6.6 per cent of the country's population live (EEA 2011:211). In addition, formal financial institutions could be termed 'not pro-poor' because they are not convenient in terms

[82] Rural households spend 90- 96 per cent of their meager incomes on food, and still do not have adequate diets (Massow 2000).

of interest rate, collateral requirements,[83] and size of the loan. This is because bankers regard the management of small loans to smallholders and micro and small enterprise operators as too costly and ineffective (Amha & Peck 2010; EEA 2011:213). This banking policy praxis is in contradiction with the principles of poverty reduction articulated on the policy documents of the government (discussed in section 4.4 above). In 2008/9, merely 12 per cent of total disbursed loans of the banking system went to the agricultural sector, and many concede that the credit is focused on large-scale commercial farmers (EEA 2011:213). There are no signs of credit schemes in identifying and promoting alternative sources of income for poor farmers (Amha & Peck 2010; Massow 2000). Apart from jeopardizing the availability of credit services to the rural poor, the low level of the banking sector missed the opportunity to mobilize savings from rural areas. Therefore, lack of access to financial services makes households weak in technology adoption, agricultural productivity, food security and overall household living conditions.

4.6.4 Natural capital

Natural capital is defined as 'the natural resource stocks from which resource flows useful for livelihood are derived' (eg land, water, wildlife, biodiversity and environmental resources) (DFID 2001). In view of this, the subsequent paragraphs are devoted to examining the status of natural capital from which the subsistence agricultural production is derived. Emphasis is given to the size of farmland and its distribution among farm households, status of crop and livestock production, and crop genetic diversity and environmental resources.

Land is a major natural capital for the Ethiopian agriculture and the livelihood of the majority of population (Amare 2002; Brietzke 1976; Kebede 2002). Estimates show that more than 50 per cent of the country's landmass is arable land and a limited portion[84] of the arable land potential is put under agricultural use (EEA 2011; Hanjra et al 2009). The inherently good soils and relatively abundant rainfall make the Ethiopian Highlands (> 1500 masl) good potential agricultural areas (Shiferaw & Holden 1999:739). The crop agriculture zones are concentrated in the highland and mid-altitude areas, while pastoralism and agro-pastoralism occupy vast areas of lowland semi-arid or arid lands (EEA 2011:48).

[83] Ninety seven per cent of loans of banks in Ethiopia required property collateral, which is much higher than 85% for other sub-Saharan Africa. The average collateral required as a percentage of the loan value is also much higher for Ethiopia (175%) compared with the mean of African countries (130%) (EEA 2011).
[84] Less than 40 % of available land is currently under cultivation (Hanjra et al 2009).

Subsistence farming provides some 90 and 98 per cent of the crop and livestock outputs, respectively (Shiferaw & Holden 1999). Over the years, crop production has shown an increasing trend, while livestock outputs are declining. In 2008/9, 3.62 million tonnes of livestock and related food products (including meat, egg, milk, honey and fish) were produced. However, production has declined by 13 per cent compared with the level in 2007/8. Total crop production reached 22.7 million tonnes in 2009/10, of which cereals, pulses, root crops, and enset account for 68, 8, 8 and 4 per cent, respectively. Sugarcane and oilseeds production account for 3 per cent each. Fruits and vegetables account for a small share of only 4 per cent of crop production, while coffee and chat provide only for 1 per cent each (EEA 2011).

The total area of substance farming increased from 9.44 million hectares in 2000/01 to 12.88 million hectares in the 2009/10 cropping season (EEA 2011:28). This shows an increase in land resources used for agriculture by 36 per cent over a decade, with an average growth rate of 4 per cent per annum. More than one third of households hold 0.5 hectares or less (Rahmato 2009). According to Rahmato (2009:306), the majority (nearly 56 %) of farm households hold 0.1 to 1.00 hectares, and 87 per cent of the farming community operate 2 hectares or less. Medium-sized holders, that is, those holding 2 to 5 hectares, constitute a little fewer than 12 per cent of households, while only 1 per cent of households may be considered large holders with over 5 hectares of land (Rahmato 2009). Though the average farm size was a little above one hectare (1.18), over 55 per cent of subsistence farmers cultivated farms less than one hectare in 2008 (EEA 2009:59).

Cereals take the largest share of the total area of cultivated land under crops, followed by pulses and oil seeds. Cereals, pulses, and oilseeds constituted 72, 12, and 6 per cent of the cultivated land in the 2009/10 cropping season, respectively. Compared with the data in 2000/01, the share of cultivated land under cereals decreased slightly from 81 per cent to 72 per cent in 2009/10, while that of pulses decreased from 13 per cent to 11.6 per cent. In terms of land productivity, the highest production per hectare was obtained in sugarcane production (35 tons/ha), followed by root crops (8.5 tons/ha), fruits (8 tons/ha) and vegetables (4 tons/ha). Average land productivity of cereals, pulses, and oilseeds was still lowest at 1.7 tons/ha, 1.3 tons/ha, and 0.8 tons/ha, respectively (EEA 2011:35-51).

The total food grain production in Ethiopia increased by 50 per cent between 2005/6 and 2009/10, implying an annual average increase of 8 per cent per annum (EEA 2011:35). However, the value added per agricultural worker (labour productivity) remains very low (US$144) compared to sub-Saharan Africa (US$344) (Hanjra et al 2009). In the Ethiopian context, food grain production is increasing because of the expansion of arable lands, while land and labour productivity is restricted by oxen holdings, farm size, limited input use, frequent droughts and poor infrastructure. Nevertheless, 'much of the future growth in food production must come from a combination of productivity improvements and area expansion' (Hanjra et al 2009:1597). Some studies show that factors affecting agricultural production can be classified broadly into household-level characteristics, technologies, credit markets, environmental and rural infrastructure facilities, rather than security of tenure (Endale 2011; Gavian & Ehui 1999). However, other recent studies affirm that perception of tenure security is an important determinant of agricultural production in the country (EEA 2002; Deininger & Jin 2006).

For centuries, Ethiopian farmers have conserved several crop varieties that they identified and domesticated. Owing to their efforts, the country is now one of the 12 recognized centres of crop genetic diversity in the world (Gebreegziabher 1999, in Beshah 2003:33). However, the conversion of pasture and forest lands to crop production, which is induced by the emerging new claimants of farmland, has resulted in a decline of wetlands and natural forests (Beshah 2003:29; Shiferaw & Holden 2001). 'An important feature of the ox-plough is that it requires open space, which is not necessarily true in the case of the hoe that can also be used in areas with vegetation cover'(Kebede 2002:137).

The forest cover of the country fell from 16.0 per cent in the 1950s to 2.7 per cent by the early 1990s, and continues to decline by nearly 1 per cent per year as woodlands are converted to fuel wood, farmland and building materials (Shiferaw & Holden 2001). Though the forest loss of the country is neither unidirectional nor permanent (McCann 1995), the ultimate analysis is that deforestation reinforces land degradation, and aggravates the already serious lack of potable water and firewood in rural areas. Shortage of potable water and firewood in turn reduces household productivity as more labour time is spent on collecting these basic items, as well as forcing them to burn the animal dung, leaves and twigs that might otherwise fertilize their farmlands (Kebede 2002; Omiti et al 1999; Reynolds, Farley & Huber 2010).

A vicious circle links deforestation with soil erosion, reduction in agricultural production, and expansion of agricultural activities onto marginal lands. In Ethiopia, land degradation, mainly because of soil erosion and nutrient depletion, has become one of the most important constraints of agricultural production. FAO (1986) estimates that 50 per cent of the country's highlands are significantly eroded, of which 25 per cent are seriously eroded, and 4 per cent have reached the point of no return. Efforts to install conservation measures on erodible lands have been initiated since the early 1980s, mainly through food for work initiatives (Amsalu & De Graaff 2007; Bekele & Drake 2003; Shiferaw & Holden 1998). Though physical soil conservation structures may help to reduce the rate of soil loss and runoff, their net effect on yields could be negative because of the loss of productive land (Shiferaw & Holden 1999). Farmers often dismantle conservation structures on their farmlands because of top-down planning and lack of participation in the design of ambitious soil and water conservation programmes (Amsalu & De Graaff 2007; Shiferaw & Holden 2000). 'Smallholders' production and land conservation decisions are likely to be influenced by factors related to their dual nature as units of consumption and production' (Shiferaw & Holden 1999:749). The complex interaction between poverty, population growth and land degradation (Reardon & Vosti 1995; Scherr 2000; Shiferaw & Holden 1998) thus offers another dimension to the soil erosion problem in the Ethiopian context.

4.6.5 Social capital

Social capital is defined as 'the social resources (networks, membership of groups, relationships of trust, and access to wider institutions of society) upon which people draw in pursuit of livelihoods' (DFID 2001). Social capital creates trust among economic agents that helps to reduce transaction costs and to improve efficient utilization of scarce resources (Jabbar, Benin, Gebre-Madhin & Paulos 2008). In view of this, the subsequent paragraphs examine the status of formal and informal institutions in the context of rural Ethiopia.

The emergence of formal rural organizations began in the Derg period where the regime established peasant associations (PA), service cooperatives (SC) and producer cooperatives (PC) in its pursuit of socialist transformation. PAs were established soon after the land reforms in March 1975 (see section 1.4). A PA was organized on a territory of approximately 800 hectares, comprising 250 households (Beshah 2003:32; Omiti et al 1999). PAs were charged with administrative matters under their jurisdiction, including land distribution. Staff of the MoA provided technical backstopping to PAs. During the Derg period, even though members of the village elected PA leaders, these leaders maintained loyalty to the ruling regime rather than to the farmers (Beshah 2003:32). They are blamed for implementing unpopular programmes of the regime such as villagization, recruiting the youth for military services, forced resettlement, tax levies and contributions from the peasants. Thus, they turned into puppet organizations instead of means to empower farmers and ensure self-governance. This gap persists, leaving much to be desired for popular participation. Poverty is perpetuated by lack of access to local government and federal government structures, which are managing resources on the people's behalf (Massow 2000; Rahmato 2009).

Generally, PAs were formal village institutions established across rural Ethiopia with an authority to reinforce law and order at the grass root level. PAs were restructured immediately after the current government had maintained law and order, and their nomenclature was changed to rural *kebele* administration in present-day Ethiopia. There are over 24 *kebele* committees in each PA, which are responsible for a wide variety of activities, including the land administration committee (LAC) (see Diagram 5.3). According to the new Good Governance strategy, each *kebele* is subdivided into sub-*kebeles (gots)* for popular participation in public administration and service delivery. Each *got* is subdivided into development teams (*yelimat budins* formerly called *mengistawi budin*) that constitute 20-30 household heads for neighbourhood-based agricultural development and non-farm activities (Rahmato 2009).

A similar effort was made by the current government to re-establish service and producers cooperatives that were disbanded soon after the May 1990 mixed economy declaration of the Derg. New legislation to reintroduce farmers' cooperatives was promulgated in January 1997 (MoFED 2005). During the Derg period, farmers were forced to be members of cooperatives in their vicinity, whereas the new legislation promotes voluntary membership. In addition, the new legislation encourages the evolution of primary cooperatives towards farmer unions. Efforts are thus geared towards strengthening the capital and managerial capacity of primary cooperatives, along with encouraging them to be market-oriented organizations that will grow to higher-level farmers' unions. Farmer's unions will serve as umbrella agencies that embrace farmers' primary cooperatives for the delivery of various services and agricultural marketing. Currently, a separate body has been established that organizes cooperatives, namely federal and regional cooperatives agencies (commissions) to strengthen the development of farmers' primary cooperatives[85] and cooperative unions. Farmers' cooperative unions are either multipurpose (handling marketing of various agricultural commodities, providing access to inputs and credit) or specialized in the creation of commodities (through processing milk, coffee and grains). According to MoARD (2010), there are currently 27,000 primary cooperatives and 175 unions in Ethiopia, of which more than 80 per cent are agricultural and multipurpose. With around 5.5 million members, they serve 31 per cent of the country's population (EEA 2011).

In addition, there are informal and traditional community-based organizations (CBOs) that mediate indigenous customs and institutions for mutual assistance. These include *Idir, Jemia, Senbete, Mahiber, Equb, and Dagu*. Almost all rural households are members of the traditional CBOs (either Idir or Jemia) which have the main function of supporting households with funeral and related expenses when they lose their family members. Households that follow Orthodox Christian faith are often members of Senbete, a CBO formed on the basis of the neighbourhood and church attendance. Mahiber is also practised by the Orthodox Christian Church followers where local liquor and bread are monthly served on the celebration day of preferred saints or angels in rounds by members. Equb is a local rotating saving groups in which members have access to rotating money either in weekly or monthly basis. Dagu is a traditional communication system that enables information and news to be passed from one person to another via acquaintances or strangers (Amare 2002; IIRR 2004).

Social institutions for borrowing, sharing, and exchanging oxen appear to play an important role in household agricultural strategies and in structuring rural debt. The most common form of exchange of draught power is the practice of 'yoking' called *maqanajo* in Shewa, *mallafagn* in Wello, and *kendi* in Oromo-speaking areas. In yoking exchange, farmers borrow a neighbour's or relative's single ox and lend their own for an equal period, calculated in ploughing days. Oxen exchange is thus a horizontal exchange between low-resource households that involves no direct accumulation of debt (Amare 2002; McCann 1995:78).

[85] Primary cooperatives broadly classified into multipurpose and financial. Cooperatives, multipurpose and financial, are key grassroots-level organizations that are critical to implementing the objectives of development programmes and strategies such as the rural development strategy, poverty reduction programmes, and food security programmes.

4.6.6 Cultural capital

The concept of 'cultural capital' is considered in this thesis in light of the working definition of sustainable development borrowed from Viederman (1996). Cultural capital refers to the body of knowledge, stories, visions, myths and languages that is shared by people and provides a framework for how people view the world and their proper role in it (Hackett 2006). In line with the research theme, this section examines the role of cultural capital in determining gender roles in the Ethiopian farming systems and local taboos and beliefs that mediate sustainable land management practices.

Ethiopia constitutes a wide diversity of cultures and patrimonial traditions that characterize the country. There are over 85 ethnic groups, which represent most major world religions,[86] as well as animist belief systems (FDRE-PCC 2008). Different religions and worldviews tend to determine the role of women in the Ethiopian farming system across space and time. Broadly speaking, Orthodox Christianity in the north, Sunni Muslims in the east and west, recently converted Protestants in the south, and animist beliefs in parts of the south tend to determine gender roles in farming systems and local taboos and beliefs about sustainable land management practices. However, the ethnic and cultural makeup of the country is extremely varied and fragmented. Semitic traditions tend to dominate in the north, Cushitic traditions in the south and east, and Nilotic traditions in the west, but there is also ethnic and cultural variation within regions, especially in the south.

There are various traditions that are useful, promotable and beneficial to the maintenance and perpetuation of the society as a whole. Nonetheless, there are numerous deep-rooted harmful traditional practices that adversely affect the health, economic, political and psychosocial wellbeing of women. Though Ethiopian men are aware of, and have expressed concern about women's low nutrition, enormous reproductive health burden, and heavy workload, they appear powerless to shift the traditional gender division of labour (Massow 2000). Ox-plough technology has gender specificity in various agricultural activities. Seedbed preparation, selecting the crop, and sowing are mostly in the spheres of male labour. Then farm activity shifts to protection, harvest, and storage. The intensity of summer rains on sloped plots requires men to plough drainage furrows; women and children weed cereal crops, especially

[86] Data obtained from the 2007 census classified them under six categories of religious affiliation. Accordingly, 43.5 per cent of the total population was Orthodox Christian and 33.9 per cent was Muslim. Protestant and traditional religious group followers accounted for 18.6 per cent and 2.6 per cent respectively (FDRE-PCC 2008).

teff; young men use slings and whips to frighten away birds from sorghum during the day and guard against baboons at dusk and porcupines at night (McCann 1995:72).

The gendered division of labour in agriculture has varied somewhat over time and place. However, there is no historical record or contemporary experience of farmers' evidence of women ploughing (McCann 1995:70; Pender & Gebremedhin 2007). Women in some cases, however, play a role in managing field preparation for household needs in contrast to their husband's concern to produce for the market or rotation. Decisions on what to grow are essentially on the interest of the household head. By extension, decisions to rent out land or to give it away, for instance to children, are taken predominantly by household heads. Most livestock is held by the husband and wife jointly, and individually held livestock nearly always belongs to the head. Even though most animals are owned jointly, the right to sell livestock and to keep the proceed of the sale falls mostly in the hands of the household head. The only exception is the right to keep money generated from the sale of dairy products such as milk, butter, cheese, and eggs, which usually goes to women (Amare 2002; IIRR 2004).

Gender relations and the influence of ox-plough technology have added further divisions in socioeconomic relations of smallholder agriculture by producing household labour patterns dominated by male cultivation, female food processing, and weak forms of cooperative labour between household units (Amare 2002; McCann 1995:77). In fact, because of their irreplaceable role in domestic activities, households are non-functional without women. While there are many female-headed households who lack male labour, this deficiency proves a major handicap in a farming system in which only men plough (Amare 2002). The absence of male labour within a household also restrains the adoption of land improvement and conservation technologies (Amare 2002; Pender & Gebremedhin 2007). In addition, the cultural capital influences the allocation of family labour into on-farm, off-farm and leisure activities. The total family labour days available exclude religious holidays that prohibit field activities (Shiferaw & Holden 1999). Because of these restrictive local taboos and beliefs regarding the allocation of family labour, the priorities of the poor remain unaddressed, and opportunities for improvement of the livelihood situation remain unfavourable and unreachable.

In spite of considerable political turmoil and development discourse over the last couple of decades, legal reform has only had a limited impact on the cultural capital that prevails in rural

Ethiopia. The major exception is the distribution and control of land in which the Ethiopian state has played a dominant role throughout the centuries. Today, the land certification scheme of the country promoted gender equity that assures joint land ownership by spouses. The pictures of both spouses appear on the certificate of holding. However, the ox-plough technology and its exclusive placement within the male domain conditioned the relative importance of land versus other forms of property. Land has little economic meaning unless women headed households' exercise their rights over animal traction. Above all, women have limited access to local government structures. Hardly any women representatives are members of local government bodies at grassroots level, such as the *kebeles* and the Peasant Associations (Massow 2000).

4.7 Conclusion

The chapter discussed that agriculture is the backbone of the Ethiopian economy that contributes for almost half of the country's GDP and over 80 per cent of both employment and export earnings. The agricultural sector of the country is dominated by subsistence farming that depends on rainfed production by smallholders. Despite the pivotal role of the sector, reducing resource degradation, increasing agricultural productivity, combating poverty and achieving food security are major policy challenges.

The chapter examined the Ethiopian farming system and rural livelihoods in light of the government's development plans and policies to tackle the problem of widespread poverty and food insecurity. In this subsistence-oriented farming system, agricultural production is used mainly for domestic consumption. In addition, farm households are characterized by both production and consumption. The chapter underscores that smallholders manage their farmlands according to their principal means of livelihood, biophysical conditions, the degree of integration between crop and livestock production systems, the level of technology in crop production, types of crops, species of animals, customs and culture, settlement pattern, values and belief system, social status and stratification, political system and the policy environment.

The chapter revealed the prevalence of different farming systems in the country with a different set of livelihood strategies being pursued in a given agro-ecology. Indeed particular household strategies change from year to year, depending on new opportunities and challenges of the rural economy. The presentation of livelihood assets reveals that destitute and vulnerable households have insufficient amounts of capital assets, which impede them from establishing sustainable livelihoods. Income derived from non-agricultural ventures is used mainly to supplement expenditure on food rather than regular investments that build their asset base. Rural financial institutions, which are meant to reach the poor in accordance with the policy statements, are unable to reach the poor. Ownership of capital assets is crucial in defining a livelihood strategy and in opening opportunities for diversification. Effective policies that address the constraints faced by the poor to access capital would possibly reverse the situation. Policy that favours vulnerable and destitute households through multiple livelihood interventions to enable them to establish sustainable livelihoods is scant. On the other hand, the better-off households have a range of assets that help them to resist and recover from shock and disaster, and establish sustainable livelihoods.

The chapter provided an overview of the livelihood assets of the majority of Ethiopian households and their entrapment in poverty as almost all productive assets disfavour the poor and reinforce conditions that perpetuate poverty traps. Natural calamities have negative consequences for all households, but disastrous impact on the destitute and vulnerable households. Land degradation because of poverty has a disastrous impact on sustainable development. The next chapter provides a contextual setting of the case study areas.

CHAPTER FIVE: CONTEXTUAL ANALYSIS OF THE STUDY AREAS

5.1 Introduction

The purpose of this chapter is to provide a contextual analysis of rural livelihoods in the Amhara Region and Yilmana Densa *woreda*, and status of livelihood assets in the case study sites (Debre Mawi and Densa Bahta rural *kebeles*). The purposive selection of study sites to this particular thesis passed through three stages. Initially, the study region was selected followed by a selection of a *woreda* and the rural *kebeles* in subsequent stages. A brief discussion and justification of the sampling process and technique appears in section 6.4.1. The rest of the chapter is organized as follows: the second section (5.2) provides a contextual analysis of Amhara region in which its location, topography, climate, soils, demography, livelihood assets and strategies are discussed. Section 5.3 provides a contextual description of household livelihoods, the availability of infrastructure and social services in Yilmana Densa *woreda* along with its administrative structure of the *woreda*. Yilmana Densa is the primary level of the administrative hierarchy that has a constitutional mandate to administer and govern the selected *kebeles*. Section 5.4 describes the location of the case study sites, along with livelihood assets in the *kebeles*. The last section provides a conclusion to the chapter.

Much of the discussion in section 5.3 and the entire discussion of section 5.4 rest on notes taken during the preparatory field visit to the case study *woreda* and *kebeles*. Characterization of the *woreda* and *kebeles*, with regard to the issues, is based on primary and unpublished data extracted from recent unpublished reports prepared by the staff of the agricultural and rural development office (see section 6.5.1). This office is a government agency operating at *woreda* level and deploys agricultural extension workers at *kebele* level. Accordingly, published references are limited to a few paragraphs of section 5.3.

5.2 Contextual analysis of the Amhara Region

5.2.1 Location and biophysical setting of Amhara region

Amhara National Regional State (ANRS) is located between $9^0 21'$ to $14^0 0'$ north latitude and $36^o\ 20'$ and $40^0\ 20'$ east longitude, and in northwestern Ethiopia. The total area of the region is estimated at 152 559.48 km^2 (BoFED 2006:9). The region shares one international boundary with Sudan (northwest) and national boundaries with four regions: Benishangul Gumz (southwest), Oromia (south), Afar (north east), and Tigray (north). The region is divided into

10 administrative zones and 150 *woredas*, of which 128 (85%) are rural (Teshome 2010). In 2001 the administrative mandate of zones was dissolved, and the three-tiered governance structure of the country recognizes the federal government, regional states and *woreda* administrations. The zones are now regarded as liaison offices of regional states and hence serve as report-compiling entities and outlets of logistical procurements. Diagram 5.1 below shows the map of Amhara region by administrative zones. The case study sites selected for this thesis are located in Yilmana Densa *woreda* of the West Gojjam administrative zone.

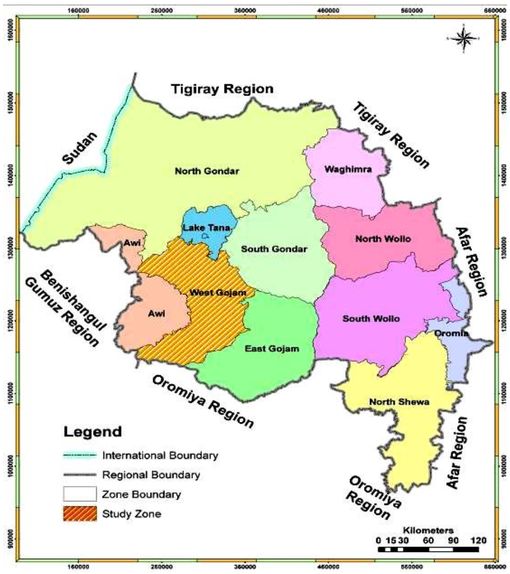

Diagram 5.1 Map of Amhara region by administrative zones

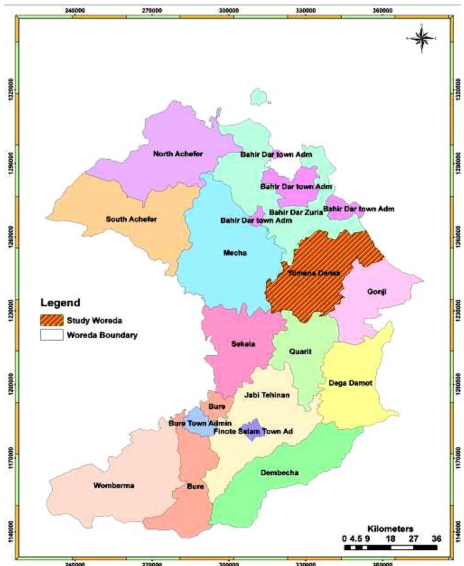

Diagram 5.2 Map of West Gojjam administrative zone by *woredas*

Amhara region has diverse topographic features, consisting of lowlands, extensive plateaus, mountains, river valleys, and gorges. The lowlands that fall between 600 and 1500 masl cover mainly the northwestern part of the region bordering the Sudan and the eastern part bordering Afar. The lowland is a large area of flat land with few trees and constitutes a considerable portion of northern and eastern parts of the region. The highland areas (southern plateau and central parts of the region) are rugged, rise up to at Ras Dashen (4620 masl), which is the highest peak in Ethiopia. Kolla, Weyna Dega, Dega and Wurch topographic zones constitute 29, 44, 27 and 4 per cent of the Amhara landscape, respectively (BoFED 2011b:12).

Temperature and rainfall amount and distribution vary across the topographic zones of the region. The recorded annual mean temperature of the region ranges from 12.4^0c in Mehal Meda (Dega) to 27.8^0c in Metema (Kolla). The mean annual rainfall recorded for the region over 3 to 25 years is in the range of 598.3 mm (Lalibela) and 1692 mm (Chagni) (CSA 2004:163). However, the region received the highest percentage (80%) of the overall annual rainfall recorded in the country (CSA 2004:160). The region experiences bi-modal rainfall distribution, in which the big rainy season Meher encompasses all areas of the region, and the small rainy season Belg covers North and South Wello, North Shewa and Oromia zones (BoFED 2006:39).

Agro-ecologically the region is broadly divided into sufficient moisture and moisture-deficit areas (BoFED 2006:25). In moisture-deficit areas the rainfall starts late and ends early, thereby these areas experience a short crop cultivation period. The northwest and northeastern parts, bordering with Sudan, Tigray and Afar regions, receive the lowest amount of rainfall, less than 700 mm (CSA 2004:163). In contrast, the rainfall starts early and ends late in sufficient moisture areas, which allows long crop cultivation period. The southern plateau and central parts of the region receive approximately 1000 mm of annual rainfall (CSA 2004:163).

The major soil types of the region include the shallow and infertile Litho soils and Phaeozems, the shallow Cambisols, deep and well-developed Nitosols, and deep and fertile Vertisols. The first three soil types are found mostly in moisture-deficit areas of the region. The Nitosols and Vertisols are found in moisture-sufficient areas. They are subject to a high level of soil degradation and in some places this has reached an irreversible stage because of cultivation of the steep slopes (BoFED 2011a). Of the ten administrative zones in the region, six (Waghemra, North Wello, North and South Gonder, eastern part of South Wello and north part of North Shewa) are severely affected by soil erosion, and experience shallow soil depth, low soil fertility and widespread gullies over farmlands (BoFED 2011b:14). Accordingly, degradation of arable lands has become a major concern in the region.

5.2.2 The nexus between population and land degradation in Amhara region

The third population and housing census shows that Amhara region had a total population of 17 214 056, with 23.3 per cent of the country's total population (FDRE-PCC 2008:83). The average annual growth rate between 1994 and 2007 was 1.7 per cent, which is the lowest in the country (FDRE-PCC 2008). Indeed, fertility and mortality rates in the region are relatively high[87] (BoFED 2006). Migration is a component of population change in the region where only 12 per cent of the population live in urban areas. The extent and direction of migration[88] thus affects the geographic distribution of the population. The 2007 population and housing census indicates 2 366 972 (13.7%) are migrants. Of these, 577 306 (24.3%) previously lived in urban areas and moved to other urban areas and rural parts of the region, while 1 789 666 (75.6%) were previous residents of rural areas and moved to urban and other rural areas of the region. The proportion of migrants in the urban areas is high (53%) compared with the number of migrants in rural areas (8.3%) (FDRE-PCC 2008:85). Because more people are attracted to urban areas, a significant proportion of the productive labour force is being drawn out of rural areas. This may have a direct negative effect on the activities of the agricultural sector and rural economy. It may also create a burden on the socioeconomic development efforts of the urban centres where the labour absorptive capacity is still insignificant. Among the total economically active urban population of the region, around 20 per cent are unemployed (BoFED 2006:16). The comparable statistics for rural areas is an unemployment rate of 0.6 per cent (FDRE-PCC 2008:475). The unemployment rate is similar for males and females in rural areas while it is higher for females in urban areas (BoFED 2006; FDRE-PCC 2008:475). This hints to the important role of women in rural productive sectors, specifically in subsistence agricultural production.

The sex proportion of the Amhara population is found 49.8 and 50.2 per cent for females and males, respectively (FDRE-PCC 2008:83). The 2007 census data were used to compute the age structure of the population and dependency ratio. The results reveal that those under the age of 15 are approximately 42.3 per cent of the regional population. The proportion of productive labour force, those 15-64 years, is around 53.4 per cent of the population. The proportion of those aged 65 years and above is approximately 3.9 per cent. Thus, the young age dependency ratio is 79.83 and that of the old age dependency ratio is 7.42, which makes the societal dependency ratio 87.25 (around 87 persons in the dependent ages for every 100 people of working age in Amhara region). However, the societal dependency ratio is around

[87] The crude fertility rate is 39.5 per 1000 people, the average number of children a woman can bear during her reproductive lifetime is about 5.1 children, life expectancy at birth is roughly 54 years, and infant mortality rate is 94 deaths per 1000 live births (BoFED 2006).

[88] In general terms, migration is the movement of people across a specified boundary for the purpose of establishing a new residence. Broadly speaking, there are two types of migration, namely internal and international migration. Internal migration denotes movement within national boundaries whereas international migration refers to movement across national borders (MoE 1999, in BoRD 2003).

94 in rural areas in contrast to 52 in urban areas of the region. A high proportion of young age population, on the other hand, indicates the potential of high numbers that will soon join the productive labour force. This warrants for the need to ensure their productive employment within the region.

The regional gross domestic product (RGDP) of the Amhara region between 1995 and 2005 is composed of 61.7, 22.9 and 15.4 per cent from agriculture, industry and service sectors, respectively (BoFED 2006:11). Despite the absence of up-to-date data on RGDP, statistics shows that approximately 87 per cent of the population derive their livelihood from agriculture and allied activities (BoFED 2011a:4). This shows that natural resources are the foundation for the regional economy, and the majority of the population depend on exploiting the natural capital in the region. Land is the prominent natural capital on which farm households derive their livelihood. The land-use of the region is categorized broadly in terms of annual/temporary cropland (85.75%), permanent cropland (0.64%), fallow (5.60%), grazing (5.37%), woodland (0.76%), and others (1.89%) (BoFED 2011b:45). The average land holding per household is 1.13 hectares in the region, but with a slight difference from zone to zone. In the eastern part of the region (South Wello, North Wello and Oromia), it is below the regional average, while in the remaining zones it is well above the regional average (Kebede 2010:87).

A considerable amount of farmland cannot produce agricultural crops, and some have been abandoned because of soil erosion. The literature (eg FAO 1986; Mekonnen 2009; Shiferaw & Holden 1998) indicates that 50 per cent of the regional land mass suffers from high to very high degradation caused by soil erosion. Approximately 1.1 billion tonnes of soil (58% of the country's soil loss[89]) are washed away annually because of soil erosion (BoFED 2006), caused by natural factors, such as topography, erratic and erosive rainfall patterns, and human action including deforestation, overgrazing, and inappropriate agricultural practices (Akalu, Ruben & Gardbrek 2010; BoRD 2003). Approximately 20,000 ha of forest area are harvested annually for fuel, logging and construction (BoFED 2006:44). The removal of vegetative cover is reinforced by the demand for animal feed. The total amount of animal feed in the region is estimated at 9.1 million tonnes of dry matter, while the total annual demand is 20.6 million tonnes (WBISPP 2002, in BoRD 2003:63). The demand for animal feed induces pressure on

[89] Estimated average annual rates of soil erosion on crop lands in Ethiopia is 42 tonnes per hectare per year (Hurni 1988).

the land more than twice its carrying capacity, and causes overgrazing, which exacerbates land degradation. In addition, forest and woodland removal is aggravated by the expansion of cultivable lands in the region. For example, in 2006 the cultivated area was increased to 3.49 million hectares from 2.91 million hectares in 2002 (BoFED 2006:22), that is, an expansion of cultivable land by 20 per cent in a five-year period.

Unless measures are taken to prevent and reverse land degradation, the expansion of the cultivable area may aggravate the vulnerability of farm households. Studies have shown that half of rural areas[90] are becoming drought prone and a considerable number of people are vulnerable and needy. The annual loss of cultivated land because of physical deterioration of the soil was 6 365 hectares in 2000 and is expected to reach 62 716 hectares by 2025 (BoFED 2006:40). To reverse the current threat, the regional state is taking a number of measures, including land-use policy and proclamation, regional conservation strategy, forest action programmes and rural development strategies.

Land law in Amhara regional state affirms the principle of public ownership of land, prohibiting its sale and mortgage, granting the certificate holder the right to use the land, bequeathing it and giving it to dependents (see sections 1.4, 1.5 and 4.2). According to the most recent rural land-use proclamation (see section 1.5), farm plots could be exchanged among farmers to redress the problem of farmland fragmentation across households. Farmers can also rent out land up to 25 years, and contracts can be renewed (ANRS 2006). This provision is more or less transfer of the user rights. Farmers are provided lifetime use rights by land certificates. The certification scheme, which was launched in 2003, was meant to provide assurance of farmers' user rights and promote tenure security. Article 8(1) of Proclamation 133/2006 prohibits further land redistribution, except for irrigable land to benefit the majority of land users. In addition, future land distribution and allotment will not be carried out unless a minimum of 80 per cent of the landholders in one village request land re-distribution (ANRS 2006:Article 8; section 1.5).

However, lifetime use rights to land come with a number of conditionalities. Briefly, they include managing the land well, undertaking soil and water conservation measures, cultivating

[90] Out of 128 rural *woredas* in the region, 64 are considered chronically food insecure and eligible for PSNP (Teshome 2010). These are characterized by severe natural resource degradation and loss of agricultural productivity (BoFED 2006).

the land continuously and living permanently in the locality (rural *kebeles*). According to Regulation 51/2007, which implements Proclamation 133/2006, any holder must undertake soil and water conservation in accordance with customary practice and modern land-use methods given to him or her through a professional counselling service. In addition, any farmer whose land is adjacent to the riverbank or gully area has an obligation to plough his or her land away from the riverbank or the gully at a distance determined by the land administration authority. The proclamation further specifies that except for a fallow period, if the holder fails to cultivate the land in every production season his or her land-use rights will be terminated. The legislation states that holders who fail to carry out these obligations would lose their rights to the land (see also ANRS 2006). As Rahmato (2004:21) notes, this gives bureaucratic power to evict someone for having failed to fulfil his or her obligations, or because he/she has been away from the locality for some time. The right to land is dependent on permanent residency in the relevant rural area and engagement in agricultural pursuits.

The administration of land is vested in EPLAUA. Apart from the regional office, the EPLAUA has the so-called EPLAUA desks at district (*woreda*) level. These desks pursue[91] the rural land certification process, based on the regional Land Use and Administration Proclamation 46/2000 and the revised version of Proclamation 133/2006. EPLAUA distinguishes between primary/provisional and secondary/permanent certificates, although there are no legal differences. In the primary certification phase, individual landholdings are recorded using traditional measurement and boundary demarcation methods. The permanent certificate is offered when a map of individual holdings has been prepared, using the land information and data, and is given to the holders in the secondary stage. Currently, the majority of *woredas* report that approximately 90 per cent of farmers in their constituency have been provided with a green booklet as a provisional land certificate (Kebede 2010:100).[92] In this primary stage, plot identification and measurement were based on customary practices

[91] Though district desks are the lower level public sector offices that pursue land registration and certification programme, village level certification process follows a sequence of information campaign and committee formation, field adjudication and distribution of registration receipts, and eventually issuance of land certificates. Following a meeting describing the programme, a land use and administration committee (LAC) was elected by popular vote at village level, which assumes responsibility for implementation of a labour-intensive and field-based registration process.

[92] Here, there is some data discrepancy as EPLAUA claims that more land was registered and more certificates were issued. It was recently reported that out of 3.2 million rural land holders, nearly 60% of land holdings in the region were registered and that 54% were issued with primary certificates of holdings (Tengnans et al 2009,in Kebede 2010:100). By late 2005, 2.4 million households (79%) were registered, 1.3 million provisional certificates were issued free of charge and common property resources were demarcated (Deininger et al 2008:1793).

and registration was undertaken in the local office of the *kebele*. The Land Administration Committees in each community, elected by the population, were responsible for plot identification, demarcation, and measurement; the *woreda* desk of EPLAUA undertook the registration. In many localities, plot boundary demarcation has been undertaken using stones as boundary markers in the primary stage of land certification. The second stage will involve modern techniques of surveying, mapping and proper registration with the aid of GPS-GIS technology. Such a full shift to the modern GPS-GIS techniques based on outcome and experience gained in the SIDA pilot project areas is envisaged in the future. As Kebede (2010:115-116) notes, the SIDA Amhara Rural Development Program (SARDP) has pioneered modern land administration system in Amhara region. SARDP put in place a comprehensive system for demarcation and computerized registration of individual land holdings in two pilot *woredas* selected from the region (Deininger et al 2011; Kebede 2010; Rahmato 2004).

Finally, Amhara National Regional State assumes responsibility for mobilizing public works that aim to cover sub-watersheds through physical and biological conservation measures. Every year, farmers in the region are mobilized to construct terraces, check-dams, drainage structures, and to plant various tree species in their locality. Farm households in all rural *kebeles* of the region have been organized into village (*got*) level development teams to undertake these conservation measures since 2011. It was reported that, among others, 607 318 hectares of farmland were covered by terraces, and 11 475 kilometres cut off drains and 20 529 kilometres check-dams were constructed through public campaigns in 2011 (BoFED 2011b:42). The regional Bureau of Agriculture and Rural Development is responsible for providing the required technical assistance through its *Woreda*-level and *Kebele*-level development workers. At grassroots, the public mobilization work, in collaboration with *kebele* administrators, is undertaken by a pool of government officials, who are given the authority to penalize those farmers who fail to participate in the campaigns.

5.2.3 Human capital development in Amhara region

The sustainable livelihood approach (see section 3.2) emphasizes that the options open to individuals and households are determined to a large extent by their asset status. This is in relation to land, physical assets, education, social networks, and financial capital (Ellis 2000). In view of this, this subsection attempts to examine the situation of human capital development in the study region in order to provide a coherent background to subsequent discussions.

The literacy level of the region's population was 31.12 per cent (26.61 per cent in rural areas and 68.48 per cent in urban areas) in 2004 (CSA 2004:75). The comparable statistics from a similar source show almost uniform result for the literacy level of Ethiopia (see section 4.6.1). Published sources indicated that there are 398 kindergartens, 6 610 primary schools, 243 general secondary schools, and 118 preparatory secondary schools in the region (BoFED 2011a:58-59)[93]. The Gross Enrolment Ratio (GER) of primary education increased from 46.5 per cent (49.9% for males and 43% for females) in 2000 to 80.7 per cent (83.9% for males and 77.5% for females) in 2005 (BoFED 2006:83). By, 2008/09 it was computed as 112.5 per cent (EEA 2011:123). This shows that the region achieved universal primary education in line with the MDG targets. This achievement might be instrumental in improving agricultural productivity and sustainable farming practices by creating a new generation of literate farmers.

The region accounted for approximately 31 per cent of the total people living with HIV/AIDS, and almost 37 per cent of AIDS orphans in Ethiopia. In addition, almost 31 per cent of the newly HIV-infected people live in this region (BoFED 2011a:78). Nonetheless, the first categorized diseases in Amhara region are all types of malaria, intestinal parasitic worms and diarrhoea (BoFED 2006:89; BoFED 2011a:69). Since 80% of the landmass of the region is favourable for malaria breeding, approximately 75% of the human population are exposed to malaria outbreaks (BoFED 2006:89). Though the potable water supply coverage increased from 10 per cent to 40 per cent in the past decade, around 65 per cent of rural households have no access to clean water supply. The coverage of potable water supply was estimated at 35 per cent for rural and 80 per cent for urban areas in the region (BoFED 2006:74). The estimation of this coverage was based on the total number of water infrastructures built in the region, instead of functional infrastructures available in the region. Approximately 37 per cent of rural households drink unprotected well or spring water while rivers/lakes/ponds serve as a source of drinking water for 24 per cent of rural households (FDRE-PCC 2008:741). As it is indicated in section 4.6.2, almost uniform statistics was reported by the same source about the sources of drinking water in rural Ethiopia. Approximately 76 per cent of households (83% of

[93] There are six public universities in the region, which the federal government administers. The Ministry of Education administers all tertiary education system and regional education bureaus have the authority to administer the education system below tertiary education.

rural and 37% of urban) also have no access to toilet facilities in Amhara region (FDRE-PCC 2008:785).

The existing health policy of the region focuses on preventing and treating the major diseases found in the region. In view of this, approximately 46 specialists, 97 medical doctors, 643 health officers, 801 laboratory technicians, 833 pharmacy technicians and 4 702 general nurses in 17 hospitals, 520 health centres, and 2 941 health posts provide health services to the Amhara population (BoFED 2011a:69 & 71). The regional primary health care service coverage was 88.4 per cent in 2006 (BoFED 2006:90) and reported to be 98 per cent in 2011 (BoFED 2011:70).

Apart from efforts to provide primary education and health services, considerable emphasis has been placed on the development of the micro and small-scale Enterprise (MSE) sector by government and the international community in recent years. The government's support to MSE is channelled mostly through the Federal Micro and Small Scale Enterprise Development Agency (MSEDA), and increasingly through regional MSEDAs. The support given to MSE includes basic training in technologies and business skills, development of low-level serviced working premises, provision of micro-credit and information on markets and techniques, and working with producers to identify constraints and bottlenecks. The agency has branch offices in all zones and *woredas* of Amhara region. Donors such as USAID and EU are recognized for their efforts in conducting studies and organizing workshops about the development of micro and small-scale enterprises sector in the region (BoRD 2003:139).

5.2.4 Food security and regional policy environment

The regional development strategy is informed by the federal government's national development policies and strategies. Likewise, the development of food security strategy by ANRS falls within the Federal Government's overall development policy and food security strategy framework, but addresses specific regional problems and priorities, taking into account in particular the regional food deficit and comparatively high level of vulnerability to drought. In accordance with the prevailing situation of Amhara region, agricultural development is the basis for overall economic transformation, and the effort is geared towards a sustainable increase in agricultural productivity by giving due attention to natural resource rehabilitation and conservation.

Though the region has few surplus crop-producing areas, the situation of food security at household level is quite different in Amhara and most farmers in the eastern part of the region face food shortages throughout the year. According to the Welfare Monitoring Survey conducted in 2004, only 1.53 per cent of rural households in the region responded that they have enough food in stock to feed themselves until the next harvest (CSA 2004:127). In the region, approximately 56 rural *woredas* are chronically food insecure, while 25 *woredas* are categorized as transitory food insecure (Kebede 2010:90). The presence of more than 2.5 million chronically food insecure and approximately 3.3 million transitory food insecure people in these *woredas* contributes much to the national[94] statistics of the food insecure population (BoFED 2006:50). The regional state has been undertaking various measures through medium-term integrated food security programme (FSP) to curb food insecurity. The pillars of FSP are improving agricultural production through involving farmers in extension packages, creating access to food through productive safety net programme (PSNP), and administering a voluntary resettlement programme.

The agricultural extension system of the region is tailored to the agro-climatic and market situations of rural areas. The region is categorized broadly into moisture-sufficient and moisture-deficit areas (see section 5.2.1 above). In view of this, two types of extension approaches are found. The first is known as the minimum package. Its major focus is on improving the productivity of crops in moisture-sufficient areas, while in moisture-deficit areas higher emphasis is given to livestock and agro-forestry development. The second type of package is the household package. It aims to enable farmers to earn 10 Birr[95] per day by providing integrated packages of on-farm and off-farm activities. Currently, all rural *kebeles* of the region are staffed with three multidisciplinary professionals for the delivery of the two agricultural extension packages (BoFED 2006; BoFED 2011a). These professionals have a diploma in the fields of study known as general agriculture, animal science, plant science and forestry. In the minimum package intervention, each *kebele* professional is expected to provide technical assistance to 30-40 development teams.[96] The household package includes 50 households under one *kebele* professional. Approximately 9 768 development agents (DAs)

[94] In Ethiopia, there are about 8.29 million chronically and 6.71 million transitory food insecure people (MoFED 2005).

[95] At the beginning of September 2014, the official exchange rate was US$1 as equivalent to around ETB19.

[96] One development team constitutes 20–30 household heads for neighbourhood-based agricultural development and non-farm activities.

with diplomas give these services to farm households in the region (BoFED 2011a:14). The *woreda* office of agriculture and rural development assumes responsibility to recruit, deploy and supervise DAs within its territory. Moreover, the agricultural extension service focused on training farmers to equip them with necessary knowledge and skills and develop literate farmers who could change the traditional production system towards a more productive and market-led system by conserving and properly utilizing their natural and human resources (BoRD 2003).

The guiding rule for PSNP targeting is that if a household (or *woreda*) received food aid for three consecutive years from 1994 to 2004, it was considered chronically food insecure and eligible for PSNP. There are approximately 2.5 million beneficiaries of PSNP in Amhara region, of which 2.25 million participate in labour-intensive public works and approximately a quarter of a million benefit from direct support schemes (Teshome 2010:6). The labour-intensive public works comprise food-for-work or cash-for-work undertakings in road construction, terrace construction and tree planting (see section 4.6.1).

Most agricultural experts acknowledge that voluntary and well-prepared resettlement programmes can partially solve the problems of population pressure and low yields in agricultural production in the northern highlands (Brune 1988; NCFSE 2003, in Rahmato 2004:25). In line with this principle, a voluntary resettlement programme has been undertaken in Amhara region as a food security strategy that aims to bestow households with better or productive agricultural lands. Accordingly, 89 049 household heads, along with 92 418 family members (a total of 181 467 people), were resettled to the western part of the region from 2001 to 2010 (BoFED 2011a:33). However, the retention rate[97] of household heads is 52 per cent. Hence the latest statistics show that only 46 011 household heads and 63 885 family members (a total of 109 896 people) live in these resettlement areas (BoFED 2011b:55). A possible justification for this low retention rate may stem from two major reasons. First, re-settlers could abandon the programme because of lack of infrastructure in hot and hostile resettlement sites. Second, re-settlers may return to their original place of residence for fear of losing land-use rights. The right to use agricultural land is dependent on permanent residency in a rural area and engagement in agricultural pursuits.

[97] 'Retention rate' refers to the proportion of household heads that did not abandon the resettlement area or those that did not return to their original place of residence.

5.2.5 Livelihood strategies and outcomes in Amhara Region

Ellis (2000) divided livelihood strategies into two categories, natural resource-based activities and non-natural resource-based activities. Natural resource-based activities include harvesting wild resources from forests, cultivation of food or non-food crops, and livestock rearing. They also include non-farm activities such as thatching, weaving, and brick making. Examples of non-natural resource-based activities include rural trading, rural services, remittances and other transfers such as pensions. However, livelihood strategies are dynamic, responding to changing challenges that households confront, and to which they adapt (Ellis 2000:40). As indicated in section 3.2, the dynamic interactions between the elements of a sustainable livelihood framework ultimately result in activities leading to certain livelihood outcomes in a given period.

In Amhara region, the livelihoods of the majority of the population depend on natural resource-based activities. Smallholder farmers in the region follow an ox-plough technology inherited from their ancestors. Mixed farming system prevails throughout the region in which farm households typically practice crop production and livestock husbandry. This rainfed subsistence farming is practised in a context in which there is severe land degradation, a shortage of and erratic rainfall, food insecurity, and limited scope for livelihood diversification (see sections 5.2.1, 5.2.2, 5.2.3 and 5.2.4 above). Accordingly, subsistence agriculture plays a leading role in the livelihoods of rural households in Amhara, in which nearly 90 per cent of the productive labour force are engaged in crop production and livestock husbandry.

Crop production accounts for 62.1% of the regional GDP (BoFED 2006). The major crop types grown in the region include cereals (teff, sorghum, maize, barley, wheat, finger millet and oat), pulses (haricot bean, chickpea, field pea, lentils, vetch, etc), oil crops (*noug*, flax, sesame, rapeseed, sunflower), and horticultural crops (onion, garlic, tomato, pepper, potato, and other fruit crops). Estimates show that the largest share of arable land is under cereals (80.7%), while pulses and oil crops occupy approximately 12.5% and 6.5%, respectively. Among cereals, teff and sorghum are predominant, whereas haricot bean, chickpea and field pea are predominant pulses (BoFED 2006; BoRD 2003). Maize, wheat and teff are regarded as erosive crops; whereas the less erosive crops are horse beans, field peas, lentils, chickpeas, and rough peas (Shiferaw & Holden 2000; Rahmato 2001). In addition, the cultivation of cereal crops demands intensive use of human labour and animal traction (Kebede 2002;

Rahmato 2009). Approximately 91 per cent of the total cultivated area is often covered in the Meher[98] production season, which depends mainly on rainfall (BoFED 2006; BoRD 2003). Food crop production is always subject to the availability of the optimum amount and distribution of rainfall.

The Amhara region, on average, contributed approximately 35.14% of cultivable lands and 32.14% of food crop production in Ethiopia from 2001 to 2010 (BoFED 2011a:12). However, the average yield of agricultural crops in the region (12.55 quintals per hectares) was lower than the national average (13.68 quintals per hectares) in this period. Average land productivity of cereals, pulses and oilseeds was 1.55 tons/ha, 1.23 tons/ha and 0.71 tons/ha, respectively, in Amhara (BoFED 2011a). The causes of low yield of agricultural crops can be categorized broadly as biotic and abiotic factors (BoRD 2003). Deficiency of essential nutrients, imbalance of elements, irregularities in and shortage of rainfall, hail and frost are among the major abiotic factors that limit crop yield. Micro-organisms such as fungi, bacteria and virus have also been identified as biotic factors that limit crop yield; of these organisms, fungi are by far the worst. Above all, insects and pests in crop fields and storage places reduce crop yield in the region.

Based on the Rural Development Policies and Strategies (RDPS) package implemented in Ethiopia, access to modern agricultural inputs such as fertilizers, improved seeds and pesticides is believed to increase the production and productivity of crops (FDRE 2001; MoFED 2005). However, only 28.73, 32.21 and 32.24 per cent of Amhara households are situated within a four-kilometre radius of fertilizer, improved seed and pesticide suppliers and markets, respectively (CSA 2004:214). Because of the RDPS package that was launched in the region, there are still opportunities to expand agricultural input utilization beyond the current consumption level (see section 4.4). Amhara region used approximately one fourth of national annual consumption of chemical fertilizer in 2001, which amounts to 0.64 million quintals (BoRD 2003:126). Though the application rate of chemical fertilizer is still very low, its utilization rate has increased from year to year in the region. By 2006, input utilization had increased to 1 million quintals of chemical fertilizer and 42 361 quintals of improved seed (BoFED 2006:23). The application rate of chemical fertilizer per hectare increased from 25.65 kilograms to 28.64 kilograms with an interval of one cropping season (BoFED 2006). The

[98] *Meher* or *Kiremet* refers to the long rainy season between June and August that constitute the main cropping season in Ethiopia (see section 4.5).

largest share of improved seed utilization was held by maize, wheat and teff in the region. These three erosive crops account for approximately 98% of the overall utilization of improved seed (BoFED 2011b). These statistics may show the deterioration of soil nutrients that left farmlands less productive in the absence of imported chemical fertilizers. They may also show the weaknesses of the agricultural extension programme in changing the agronomic practices of farmers towards less erosive cultigens. Moreover, the agricultural extension package compromised the merits of organic farming to retain soil nutrients, and emphasis is given to the short-term benefits of chemical fertilizers to boost crop yield. In the 2009/10 cropping season, the highest land productivity in the region was recorded in maize production (2.25 tons/ha), followed by haricot beans (1.66 tons/ha), and wheat (1.63 tons/ha) (BoFED 2011a:12).

Expansion of cultivable lands rose by approximately 22 per cent, while crop yield harvested increased by approximately 52 per cent in the 2009/10 cropping season (BoFED 2011a:12). Food production has therefore been rising through the integrated forces of area expansion and use of improved technologies. However, land and labour productivity was almost static compared with the level of productivity recorded for the 2004/5 cropping season, when the productivity of teff, barley, wheat and sorghum was 9.55, 10.61, 14.5 and 17.43 quintal per hectare, respectively. The comparable productivity in the 2009/10 cropping season was approximately 12.85, 13.07, 16.34 and 22.53, respectively (BoFED 2011a:12). This static productivity level urges enhanced efforts to increase crop yield through intensive use of improved technologies and the irrigation potential.

Water is the second important natural capital of Amhara region, from which subsistence agricultural production is supported. The water sources are river drainage basins, surface and ground water resources that have potential for irrigation and fishery schemes. The Abay, Tekkaze and Awash river basins and Afar drainage basin are the four main sources of water. The Abay river basin, the largest in the country, has a catchment area of approximately 198 812 km^2, of which 89 857 km^2 (46%) are located in Amhara region and it drains more than 80 per cent of the surface water. The Abay river basin drains into a portion of the surface water sources, including Lake Tana (the largest inland lake in the country), and other lakes such as Zengena, Tirba and Hike. Tekkaze and Awash river basins drain the remaining 20 per cent and a very small portion of the region is drained by the Afar basin. Tekkaze has an area of approximately 88 800 km^2 and the upstream part of the catchment area of the river is within the region. The Awash river, with its Borkena, Robit, Upper Nile, Upper Kessem and Girana sub-basin tributaries, drains the south and southeast plateau and sub-eastern lowlands to end in Lake Abaya. The Afar drainage basin, on the other hand, serves only as a drainage network for small portion of the eastern lowlands, including the Raya Kobo valley (BoRD 2003).

The Amhara region is endowed with rich livestock resources, which account for one third of the national livestock population (BoFED 2006; BoRD 2003).[99] Approximately 25, 36, 28, and 32 per cent of cattle, sheep, goat, and equines, respectively, are found there (CSA 2004). The livestock population is estimated to be 12 746 768 cattle, 8 596 993 sheep, 4 878 462 goats, 2 108 347 donkeys, 352 648 horses, 127 716 mules, 34 649 camels, 12 739 620 poultry, and 822 336 bee colonies (BoFED 2011b:38). These high numbers of livestock imply the threat of overgrazing, which entails land degradation; however, they show that the number of livestock a household possesses compromises livestock breed quality. Local farmers often regard the amount of livestock that they possess as indicators of higher social status and wealth.

Livestock development accounts for 22 and 12.5 per cent of agricultural and regional GDP in Amhara region, respectively (BoFED 2006:33). Accordingly, the contribution of livestock to the livelihood of rural households is significant and benefits many enterprises. Where mixed farming system dominates, livestock provide traction to undertake cultivation, threshing, transportation, and supplies cooking fuel and manure for the rural masses. In addition, livestock provide supplementary diets such as milk, meat, egg, honey, and fish. In the eastern part, where crop production frequently fails because of unreliable rainfall, livestock are the basic means of food security and a pillar of the household economy (Kebede 2010:92). Moreover, the sub-sector contributes live animals, hides and skins, and beeswax for domestic use, as well as export markets.

However, diseases such as anthrax and blackleg and external and internal parasites are not uncommon in the region. Livestock health service coverage is 64 per cent, while area coverage is approximately 93.4 per cent (BoFED 2006:38). There is a chronic shortage of animal feed in the region. The total amount of feed that can be produced is only 69.1 per cent and

[99] Ethiopia stood first in Africa and tenth in the world in terms of livestock population. The sub-sector contributed 12 per cent of the total GDP and over 30 per cent of the agricultural GDP (MoA 1998, in BoRD 2003). Export of livestock is currently limited mostly to hides and skins, but there is great potential for exporting beef, mutton, and goat meat, milk and milk by-products to neighbouring countries.

improved forage seed utilization is only 9.9 per cent. Hence, animal productivity[100] and distribution of improved varieties are minimal (BoFED 2006). The prevalence of livestock diseases and scarcity of animal feed has severe consequences for livestock numbers, and crop cultivation as draught power is an important farm input (Kebede 2002).

The MSE sector is second after agriculture in engaging large numbers of people in Amhara region. Handicrafts and related activities, other non-farm activities (food and drink, trade and industries) and miscellaneous sources of income were the means of income generation for 11, 34 and 7 per cent of households, respectively (MoLSA 1997, in BoRD 2003:178). In 2002, there were 405 855 MSEs, which accounted for 24 per cent of the total of MSEs in the country (CSA 2002, in BoRD 2003:179). Of these MSEs, 271 623 or 67 per cent are engaged in production, while the remaining 134 232 or 33 per cent are involved in trade and service provision. Of the 262 830 micro and 8 793 small-scale producers, almost half are located in small rural towns. The total number of people employed and start-up capital of producer enterprises are 385 612 people and ETB106.2 million, respectively (CSA 2002, in BoRD 2003). The credit support provided for MSE increased from ETB 46.6 million in 2005 to ETB126.26 million in 2010 (BoFED 2011a:46). Financial capital thus play a vital role in efficient utilization of human and natural resources via buttressing the MSE sector in rural towns of the region.

In contrast, lack of access to financial services is one of the major factors that hinder the development of MSEs, the efficient utilization of resources, and livelihood diversification in rural areas. Lack of access to credit services makes rural households weak in technology adoption, agricultural productivity, food security and overall household conditions (Shiferaw & Holden 2000). Sustainable provision of credit services requires mobilizing saving from rural areas. Most rural households save for future planned investments and maintaining a constant level of future consumptions. These households usually keep their extra cash as livestock and durable consumer goods that could be sold during bad times (Amare 2002), instead of putting it in saving accounts or 'fiduciary deposits' (Amha & Peck 2010:32).

[100] Milk productivity per cow was 1.2 litre per day during the 234-day lactation period; local chicken produced on average 68 eggs/layer/year; exotic chickens gave 151 eggs/layer/year; modern, transitional and traditional beehives produce 25.1,16.6 and 6.62 kg honey per beehive, respectively (BoFED 2006).

According to the licensing regulations and supervision of national monetary and financial law, the rural financial system in the region can be grouped into formal, semi-formal and informal institutions. Formal financial institutions include commercial banks, insurance companies, and micro-finance institutions. Semi-formal financial institutions consist of financial cooperatives and similar initiatives of NGOs. Informal institutions include local moneylenders *(arata abedari),* rotating saving and credit associations *(equb)* in homogeneous social groups, and local insurers *(idirs)* that focus on savings and lending for social ceremonies such as burials, relatives and friends. Formal and semi-formal institutions operate according to the rules and regulations of the national bank, whereas informal providers do not do so.

Most formal financial institutions deliver their credit services to relatively well-off people that can repay the loan, of whom the majority live in urban areas. The managements of these institutions perceive that provision of financial services in rural areas could have high administrative costs and credit risks. The proportion of the population with access to formal financial services is 13 per cent (Amha & Peck 2010:27). The rural masses are therefore deprived of credit access by formal financial institutions. Most rural households access credit from informal sources, which impose many constraints and inconveniences (Amha & Peck 2010). To improve the status of financial services to rural households, the Amhara Credit and Saving Institution (ACSI) has opened sub-branch offices in all *woredas* of the region. ACSI is a microfinance agency that works principally to improve the accessibility of credit services in rural areas and to mobilize savings from rural households.[101] ACSI and other smaller MFIs and saving and credit cooperatives serve only the 4 per cent of the region's population that have access to formal financial services (Amha & Peck 2010). Accordingly, shortage of financial capital is a hurdle for rural households that wish to diversify their livelihood opportunities (Gebreselassie 2009).

Cooperatives provide agricultural input marketing, product marketing and credit services to member farmers. In 2005, there were 158 agricultural cooperatives in the region, with approximately 1.5 million members, of whom 10.8 per cent were women. Additionally, there were 748 non-agricultural cooperatives in the region in the same year. Approximately 45 per

[101] The major functions of ACSI include advancing credit to the needy, accepting savings, serving as a money transfer agency, and making payment to pensioners as delegated by responsible office. It operates through its headquarter in Bahir Dar, 10 branch offices across zones and 162 sub-branch offices covering all *woredas* in the region.

cent of farm households were members of the agricultural and related cooperatives in 2005, and 97 per cent of rural *kebeles* were covered by these cooperatives. To strengthen their capital and managerial capacity as market-oriented organizations, cooperatives developed 26 farmers unions, which covered 99 *woredas* (BoFED 2006:37). Nonetheless, recent statistics disclose a declining trend in cooperative proliferation. The total number of cooperatives was 829 in 2006/07, but declined to 293 in 2009/10, of which 142 were agricultural and 151 non-agricultural (BoFED 2011a:28). Lack of transport, and of communication infrastructures and energy sources might be responsible for the significant decline of non-agricultural cooperatives. Road, air and sea are the three major transport systems. Statistics show that the region had a total length of 7 617 km all-weather roads, which makes the regional road density 48 km per km^2 (BoFED 2011b:52). Air transport is the second form of transportation, used mostly to connect major cities such as Bahir Dar, Dessie, Gondar and Lalibela with the country's capital, Addis Ababa. Marine transport is practised in areas around Lake Tana.

Biomass fuels provide 99 per cent of household energy supplies in Amhara region, with 65 per cent being derived from woody biomass, 21 per cent from dung and 14 per cent from crop residues (WBISPP 2002, in BoRD 2003:69). A comparison by WBISPP (2002) of studies undertaken in 1984 and 2000 reported an increased trend in annual consumption of biomass fuel in rural areas. The regional average consumption of fuel wood has increased from 436 kg per capita in 1984 to 814 kg per capita in 2000. A large increase in the use of crop residues as fuel was also observed in this period, which shot up from 2 kg to 186 kg per capita. In contrast, the consumption rate of dung decreased significantly, and fell from 463 kg to 299 kg per capita (WBISPP 2002, in BoRD 2003:69). Where fuel wood is scarce, crop residues and dung are used as energy sources; as a result, they are no longer available as organic fertilizer for agriculture, affecting the stability of an agricultural system and food supply (BoRD 2003).

The majority of households in urban areas of the region use biomass fuel for cooking (FDRE-PCC 2008:855). Firewood, charcoal and dung are used for cooking in 88, 64 and 37 per cent of urban households, respectively. Though 71 per cent of urban households use electricity for lighting, only 2 per cent use it for cooking (FDRE-PCC 2008:869, 855). The absence of a cheap alternative source of energy is thus a major factor behind rapid deforestation in Amhara region. The direct consequence has been the degradation of agricultural lands through soil erosion, causing low yields in agricultural crops. Deforestation aggravates the serious lack of potable water through its effect on surface and ground water sources and jeopardizes the availability of firewood in rural areas (Reynolds et al 2010). Based on annual per capita fuel wood consumption,[102] the amount of woody biomass may decline by 66 per cent in five years (BoFED 2006:40). Approximately 76.3 per cent of households travel more than two hours to gather firewood, a task that is often handled by women and girl members (UNECA 1996, in BoRD 2003:71). Despite ethnic and religious diversity, the cultural capital in the region uniformly influences the exclusive role of women and girls to gather firewood and fetch water for domestic use.

Within its geographical boundaries, the region has many ethnic groups. The main group consists of the Amharas, who speak Amarigina (Amharic) as their first language, and constitute approximately 90 per cent of the region's population. Other ethnic groups include the Awi (Agew) people, who speak Agewigna; Oromo ethnic groups, who speak Afan Oromo; and many smaller groups, such as the Argoba and Tigre. A large majority of the population of the region are followers of Orthodox Christianity, followed by Islam (BoFED 2006). Approximately 83 and 16.8 per cent of the rural population are Orthodox Christian and Muslim, respectively (FDRE-PCC 2008:193).

5.3 Contextual description of Yilmana Densa woreda

5.3.1 Location and biophysical setting of Yilmana Densa *woreda*

Yilmana Densa is one of 18 *woredas* found in West Gojjam administrative zone of Amhara region (see Diagram 5.2 above). It is bordered by Bahir Dar Zuria *woreda* in the north, Sekela and Quarit *woredas* in the south, Gonji *woreda* in the southeast, South Gondar zone in the east and Mecha *woreda* in the west. The *woreda*'s administrative town, Adet, is situated 43 km southeast of Bahir Dar, the regional capital, along the highway to Addis Ababa via Motta. Adet is located approximately at the intersection of $11^0$17'north latitude and $37^0$43' east longitude on an altitude of 2240 masl (see Diagram 5.4 below).

The total area of Yilmana Densa *woreda* is approximately 991.8 km^2, of which 24 per cent is classified as highlands, 57 per cent as mid-altitude, and 19 per cent as lowlands (BoFED 2011b:8). Approximately 65, 20 and 15 per cent of the area is covered with red, black and brown soils, respectively. Land use in the *woreda* is divided into cultivated land (52.2%),

[102] The annual per capita fuel wood consumption in Amhara region is 652 kilograms (1.09 M^3) while that of Ethiopia is 700 kilograms (1.12M^3).

flooded and swampy areas (1.6%), grazing lands (4.4%), forestland (7%), and built-up and residential areas (1.4%). The remaining 33 037 hectares (33.31%) of land are classified as non-productive or useless land (YDARDO 2013). This comparatively high proportion of useless land points to the severity of land degradation in the *woreda*.

The *woreda* receives an average annual rainfall of 1051.8 to 1488.2 mm and temperatures range from 8.8 to 25.2^0 C with altitude ranging from 1552 to 3535 masl (YDARDO 2013). Agro-ecologically, it is categorized among the moisture-sufficient areas of Amhara region. It receives a good amount of rainwater, which allows rainfed agriculture. However, the concentration of rain in the Meher season is heavy, and may accelerate soil erosion.

5.3.2 *Woreda* administration

A *woreda* is the lowest official administrative structure in Ethiopia, which is regarded as the third level of governance structure. The *woreda* comprises all public sector offices in line with the regional bureaus, which in turn are organized in line with federal ministries. Each *woreda* has a number of smaller administrative units called *kebele,* with their *kebele* administration and village- *(got)* level development teams. The *kebeles* (areas with an average population of 5000) are the local-level administrative structure. Diagram 5.3 shows the administrative structure of Yilmana Densa *woreda*.

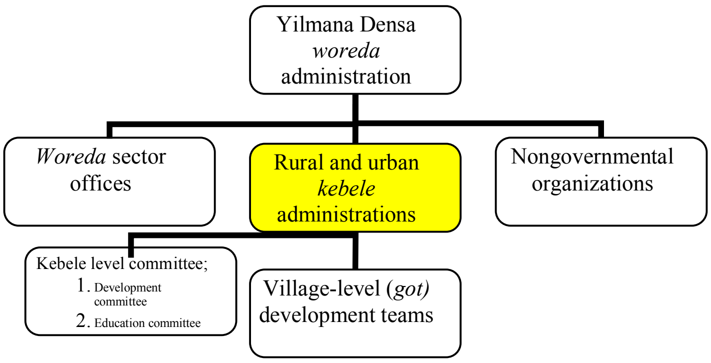

Diagram 5.3 Administrative structure of Yilmana Densa *woreda*

Adet Agricultural Research Centre, the largest and the oldest of its kind, is located in the capital. In addition, 12 public sector offices, 5 non-governmental organizations (NGOs), 15 farmers' cooperatives, 1 microfinance institution and 1 commercial bank are located in the *woreda*.

The *woreda* is sub-divided into 36 *kebeles*, of which 33 are rural and 3 are urban (BoFED 2011b:8). The number of food insecure *kebeles* in the *woreda* is 11 (YDARDO 2013). The map of Yilmana Densa *woreda* (Diagram 5.4 below), shows the administrative sub-divisions *(kebeles)* of the district. The *woreda* council ('parliament') is the highest political organ and is elected every five years. The council comprises representative members elected directly by the residents of all the *kebeles* in the *woreda*. It appoints the *woreda* administrator and other cabinet members. Through its executive members, the *woreda* cabinet is responsible for overall administration of the *woreda*. The main constitutional powers and duties of the *woreda* council and its executive are:

- Preparing and approving the annual *woreda* development plans and budgets and monitoring their implementation
- Setting certain tax rates and collecting local taxes and levies
- Administering primary schools and health institutions
- Managing agricultural development activities, and protecting natural resources

Woreda development plans and policy interventions are usually executed as day-to-day routines. Based on the current Good Governance Strategy, these routines are executed at grassroots levels through *kebele* administrations and village-level development teams (see section 4.6.5). According to this strategy, each *kebele* administration has a cabinet consisting of seven members. Among the *kebele* cabinet members, four are elected, and the remaining three members represent the *kebele* sector offices: agriculture extension coordinator, health extension coordinator and the chairperson of the education board. Among the *kebele* cabinet members, one third are women. Each *kebele* is supposed to establish a minimum of four committees: development committee, education committee (or board), health committee, and justice and administration (see Diagram 5.3 above). The main responsibilities of the *kebele* administration are:

- Preparing an annual *kebele* development plan
- Ensuring the collection of land and agricultural income tax
- Organizing local labour and in-kind contributions to development activities
- Resolving conflicts in the community through the social courts

In order to mobilize local labour for community-asset building, each *kebele* administration is supposed to organize farmers into village-level development teams. Accordingly, during the data collection period there are approximately 1 470 *got*-level development teams in the *woreda*, and, on average, each team has 25 members. In total, there were 41 765 (33 894 men and 7 871 women) development team members in 2013 (YDARDO 2013). Every year between January and March there is a public campaign that mobilizes team members to construct terraces, and check-dams and other conservation structures in their own village.

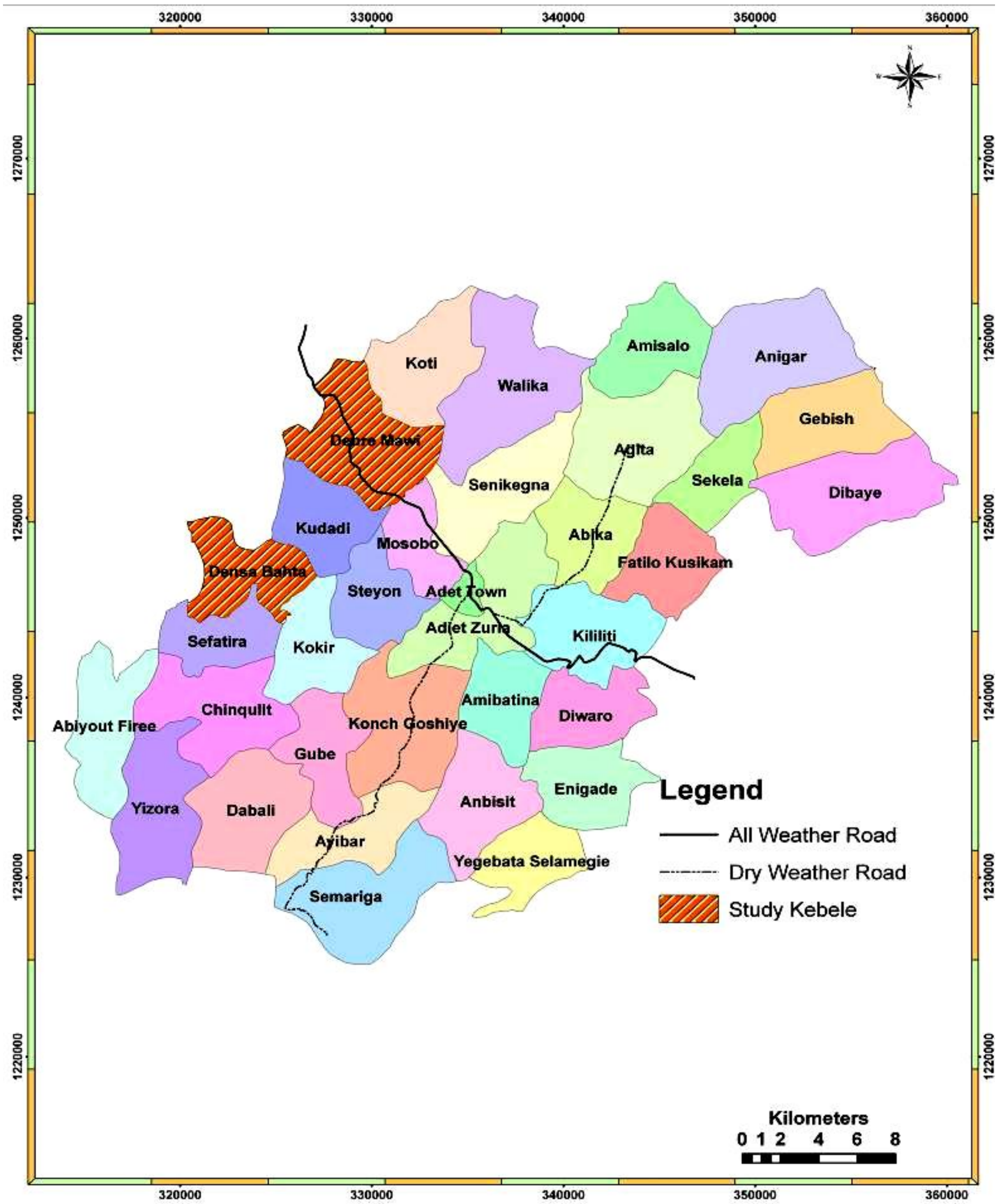

Diagram 5.4 Map of Yilmana Densa *woreda* by *kebeles*

5.3.3 Demography and livelihood setting in Yilmana Densa *woreda*

Demography of Yilmana Densa *woreda*

During the third national census, the total population in the *woreda* was estimated at 214 852, showing almost the same proportion of men and women in all age groups but with a slight difference in urban areas (FDRE-PCC 2008:120). The sex ratio of the *woreda* population is 0.99, or 99 males per 100 females in the *woreda* (FDRE-PCC 2008:120). However, the sex ratio is one, or 100 males per 100 females in urban areas, in contrast to 0.99 in rural areas. The main ethnic group are the Amharas, who speak Amarigina (Amharic) as their first language and comprise 99% of the population. Approximately 98 and 1.7 per cent of the *woreda* population, respectively, are Orthodox Christians and Muslims. The balance belong to Protestant, Catholic, traditional and other faith systems (FDRE-PCC 2008:207).

Approximately 91% of the total population reside in rural areas and the balance in urban areas (FDRE-PCC 2008:120). The proportion of people below 15 years of age is 41.32%. Population above 64 years is approximately 2.63%. More than 94 % of dependent age (below 15 and above 65) live in rural areas, and the balance in urban areas. The societal dependency ratio of the *woreda* is 78.45, which means that there are 78 persons in the dependent age for every 100 in the productive labour force. There are around 87 persons in the dependent age for every 100 of working age in Amhara region (section 5.2.2 above). The dependency ratio of Yilmana Densa *woreda* is thus slightly lower than that of the region. The dependency ratio for rural areas of Yilmana Densa *woreda* is 84, while the comparable result for rural areas of Amhara region is 94 (see section 5.2.2).

The productive labour force (15–64 years of age) comprise around 56.03 % of the *woreda* population, which was estimated at 58 958 males and 61 434 females in the third Population and Housing Census (FDRE-PCC 2008:120). Around 88% of the productive labour force live in rural areas and the remaining 12% in urban areas. However, the productive labour force comprise 73 and 54 per cent of the total population in urban and rural areas, respectively. As a result, the dependency ratio falls to 38 in urban areas. This may also show the pattern of productive labour force migration from rural areas towards urban centres because of pull and push factors. The push factors might be low access to productive assets and poor social services and infrastructures in rural areas. The pull factors could be an expectation of better livelihood opportunities in the formal and informal sectors, coupled with better social services and infrastructures in urban areas. However, the unemployment rate is much higher in urban areas (12.5%) in the *woreda* than rural areas (0.4 %) (FDRE-PCC 2008:490). Unemployment in urban and rural areas of Amhara region was estimated at 20 and 0.6 per cent, respectively (section 5.2.2). The unemployment rate of both urban and rural areas of Yilmana Densa *woreda* is slightly lower than the regional average.

Livelihood setting in Yilmana Densa *woreda*

The conventional asset pentagon of farm households comprises these forms of capital:

- Human: active labour force, male, female and dependants
- Financial: cash, credit, livestock, valuable goods
- Physical: productive goods, plough set, residential house, oxen, road, water, health and education infrastructures
- Natural: land, streams, river, hillside, cash crop, trees and perennial crops
- Social: *idir*, local CBO, *senbete* and village-level development teams

These determine the livelihood strategies of households in Yilmana Densa *woreda* (see sections 3.2, 4.6, 5.2.5). The existing transforming structures (levels of government and private sector) and processes (laws, policies, culture and institutions) influence households' access to these livelihood assets and strategies in order to achieve sustainable land management practices. Farmlands are crucial assets that support the livelihoods of the majority of the rural population in Ethiopia in general and in Amhara in particular.

Yilmana Densa *woreda* is a typical rural setup with approximately 90% of the population making their living from agriculture and related activities, mainly subsistence agriculture. They grow their crops mostly during the rainy season (Meher). Yilmana Densa is known for its adequate ground and surface water resources. It is located in the catchment area of the Abay River. The rivers, streams and wetlands in this catchment make the *woreda* rich in resources that are broadly used in irrigated agriculture. Nevertheless, the community, which has little modern irrigation technology infrastructure, has constructed most irrigation systems.

The growing period for the main crops is subject to rainfall from June to the end of August, with a relatively cold spell in November and December. Farm households depend on cereal crops as a major source of cash and food. Major cereal crops (teff, barley, maize and wheat), pulses (faba bean, field pea, chickpea, and grass pea), oil crops (*Noug* and linseed) constitute approximately 57, 22 and 7 per cent of the current cultivable land in the *woreda*, respectively (YDARDO 2013). The remaining 14 per cent is allocated to vegetables and spices. The dominance of cereal crops is significant in terms of the volume of production and the area of land under cultivation. Cereals and pulses are processed by animal power and stored in traditional containers built of tree fibre and clay. Losses during the processing and storage period are estimated to be 10 to 30 per cent of the total harvest. There are no grain stores in the *woreda* or in the study *kebeles*. It is not possible to store grain that is not sold on market day and farmers are forced to go home with unsold grain and agricultural products. In addition, the absence of storage facilities results in significant price variations as most farmers market their products around harvest time when supplies are good, and prices are lower than at other times of the year. Improved on-farm storage facilities would enable farmers to market their crops when prices are higher and the consumer would benefit from moderating price fluctuations. Some farmers' cooperatives act as marketing agents for their members by buying and selling inputs and agricultural products, especially cereals, oilseeds and legumes.

Although crop production is considered the major livelihood activity, it is largely complemented by livestock production. Livestock production is carried out in traditional and ineffective ways. It relies on local breeds that are allowed to graze permanently and freely on communal grazing areas, which affects the growth and productivity of the forage. In addition, the number of animals is normally far higher than the carrying capacity of the area, resulting in overgrazing and land degradation. The livestock population in the *woreda* comprises 4 435 oxen, 30 485 cows, 13 482 bulls, 15 377 heifers, 17 398 calves, 71 927 sheep, 13 280 goats, 19 792 donkeys, 2 284 mules, 780 horses and 79 655 poultry (YDARDO 2013). During an informal discussion, experts from the Agriculture and Rural Development office stated that livestock productivity is impaired by the shortage of feed and the backward traditional management system.

The *woreda* road network is limited to 204.588 km, of which 60 km are all-weather rural roads and the balance are feeder roads among *kebeles* that fall into the category of seasonal community roads. The total road network of the *woreda* gives road density of 0.22 km/ km^2 and 0.95 km/1,000 people. Road density is below half of the regional average (section 5.2.5 above). There are no asphalt or tarmac roads in the *woreda*. The most common means of transporting agricultural products to the markets are mules, donkeys and carts, rarely, in the lowlands where there are feeder roads over flat land. In the highlands, where the topography is largely rugged and mountainous, there are serious problems of transportation because of the lack of proper roads and, hence, donkeys and mules are used as a direct means of transport.

Industries that process or transform agricultural products are not found at village and *woreda* level. Producers consume most of the major crops, while a few are sold in local markets as they come after threshing. There are 14 local markets in the *woreda*, which is not enough for all the population. Indeed, the producers located on the border of the *woreda* utilize markets in neighbouring *woreda*s. Most grains and some vegetables are sold to traders, and small amounts are sold in the local markets. The marketplaces are not organised and lack facilities, including waste deposits, toilets, sheds, proper walking spaces and elevated structures to display the products. The view is chaotic and presents safety and health risk for vendors and their customers. This situation is a threat to the environment as residues and other waste products are deposited anywhere, converting them into agents of contamination and health hazards. Moreover, there is no form of marketing information such as prices, standards, quantities and products in demand. The merchants, quality not being a factor that affects the price of grain, fix the prices of agricultural products. This, coupled with poor transport infrastructures and absence of storage facilities at village level reinforces the discretionary role of few merchants in local markets. A few residents of the *woreda* use formal sources of market information (radio, television and newspapers). A total of 92, 42 and 95 per cent of households in the capital Adet do not have telephone, radio or television, respectively (FDRE-PCC 2008:892).

Access to modern education depends entirely on public sector educational infrastructures in Yilmana Densa *woreda*. The role of the private sector in the provision of kindergarten and primary education services is negligible. The public sector administers 34 first cycle primary schools (Grades 1 to 4), 32 full cycle primary schools (Grades 1 to 8), 43 alternative child education centres, 25 satellite schools, 28 adult education centres and 1 secondary school (Grades 9 to 12) to address the demand for formal education. The gross enrolment ratio (GER) of primary education is estimated at 100 per cent (YDESO 2013). This implies that all school-age children have access to primary education in the *woreda*.

The top ten diseases that jeopardize the health of the population are malaria, tuberculosis and other lung diseases, intestinal parasites, diarrhoeal diseases, gastritis and duodenitis, eye diseases, skin wounds (infections), epilepsy, hookworms, and homicide and injury (YDHSO

2013). Seventy-eight per cent of households (24 % urban and 85% rural) do not have a toilet facility (FDRE-PCC 2008:780). Added to this, 24 per cent of rural households drink unprotected well or spring water, and 37 per cent of rural households drink water from rivers, lakes, or ponds. These results are similar to the situation of rural Ethiopia (see section 4.6.2) and rural Amhara (see section 5.2.2).

The majority of rural households in the *woreda* have access to health facilities in their vicinity. The health posts, in particular, are situated near or inside the *kebele* centres, where the *kebele* administration office and other community service facilities (schools, *kebele* shops, grinding mills, etc) are also located. In each *kebele*, there is one health post (HP) and two health extension workers (HEWs). For most of the rural community, the travelling distance to access preventive health services is not a significant hurdle (YDHSO 2013). However, HPs and HEWs do not offer curative and major rehabilitative medicine, restricting themselves to preventive medicine. Thus current primary health services to rural communities place less emphasis on diagnosis and treatment of diseases that require major rehabilitative treatment. Regardless of efforts towards equitable provision of primary health services using existing health resources (1 health centre to 25 000 people, 1 health post to 5 000 people, 2 HEWs per *kebele*), needs of preventive and curative health services that are vital to the community are not satisfied.

As alternative sources of income, a few people are engaged in non-farm activities such as pottery, metalwork, weaving and carpentry. There are insignificant numbers of village basket makers, who provide essential services to their communities. The problems for these artisans range from the use of primitive technology to the lack of raw materials and promising market outlets.

In the *woreda*, trees constitute the major source of wood for fuel, domestic furniture and construction. Animal dung, farm residues and other biomass are other sources of fuel. A total of 93, 77 and 15 per cent of households in Adet used firewood, charcoal and dung for cooking, respectively (FDRE-PCC 2008:861). The comparable statistics for urban areas of Amhara region were as 88, 64 and 37 per cent, respectively (FDRE-PCC 2008:855). The use of biomass fuel (firewood and charcoal) for cooking shows the extent of deforestation, which has direct and indirect consequences for land degradation.

The next section examines the status of livelihood assets in the selected study *kebeles* of this particular research. The entire discussion of section 5.4 rests on the researcher's field notes, and first-hand information gathered from the agricultural extension workers in the study *kebeles*. The statistical data were extracted from unpublished quarterly reports (Agegnehu 2013; Birhanu 2013) by agricultural extension workers, based on the checklist developed prior to the researcher's field visit. In some cases, the statistical data obtained from Agegnehu (2013) and Birhanu (2013) were processed with MS-Excel 2007 to use simple descriptive statistical methods to characterize the current situation of the case study *kebeles*. Above all, the researcher took proper field notes during the stay in the study *kebeles* that were instrumental for triangulating the data from unpublished reports (Agegnehu 2013; Birhanu 2013; YDARDO 2013; YDESO 2013; YDHSO 2013) and the discussion of sections 5.3 and 5.4 of this chapter.

5.4 Status of livelihood assets in the case study kebeles

The case study sites of this thesis are Densa Bahta and Debre Mawi *kebeles* in Yilmana Densa *woreda* (see Diagram 5.4 above). The main criterion for selecting the case study sites at the research proposal stage was topographical in terms of flatness and steepness on the topographic map. Debre Mawi is steeper, and was expected to have a shortage of arable land and higher land degradation. Densa Bahta is flat, and was expected to have relatively better availability of arable land and less land degradation. Apart from the main criterion considered for purposive selection of the study *kebeles* (see section 6.4.1), the researcher found a very interesting contrast among the *kebeles* during the preparatory field visit. The main highway that joins Bahir Dar and Addis Ababa passes through Debre Mawi, while Densa Bahta is located 7 km from an all-weather road. Households in Debre Mawi *kebele* have access to a 24-hr electrical service, a potable water supply, landline and mobile telephone along with television services, which is not the case for households in Densa Bahta *kebele*. Accordingly, Debre Mawi can be regarded as a rural area with better development infrastructures, whereas Densa Bahta could be considered an averagely remote rural *kebele*. In view of this, the subsequent two subsections provide a simple description of the status of livelihood assets in the study *kebeles*. At the end of the second subsection, comparative analysis on the status livelihood assets across the two case study *kebeles* is done using selected indicators as summarized in Table 5.1 below.

5.4.1 Status of livelihood assets in Debre Mawi *kebele*

Debre Mawi is one of 33 rural *kebeles* in Yilmana Densa *woreda* of Amhara region. The *kebele* is situated 33 km southeast of Bahir Dar and 10 km northwest of Adet, the *woreda* capital, on the highway to Addis Ababa via Motta. The total area of Debre Mawi *kebele* is approximately 27.67 km² (2767 ha), which lies in the Weyna Dega topographic zone. The *kebele* receives an average annual rainfall of 1200 to 2200 mm and temperatures range from 8 °C to 26 °C with the altitude ranging from 2200 to 2351 masl. Approximately 58, 38 and 4 per cent of the land in this *kebele* is covered with red, black and brown soils, respectively. Current land-use is divided into cultivated land (87.96 %), grazing lands (5.28%), forest land (1.84%), and built-up and residential areas (4.9%) (Agegnehu 2013). The *kebele* comprises three villages, namely Debre Mawi, Abetrar and Gutta. Debre Mawi could be regarded as an emerging rural town since it was granted semi-municipal status in 2012. The subsequent paragraphs discuss the status of six important livelihood assets in the *kebele,* based on primary data gathered from the three agricultural extension workers (see section 6.5.1).

The SLA emphasizes that the options open to individuals and households are determined to a large extent by their asset status. The next sections therefore attempt to present the status of human, physical, financial, natural, social and cultural capital in Debre Mawi *kebele*.

Human capital

Human capital refers to the productive labour available to a household and includes household members' skills, knowledge, ability to work and good health required to take part in livelihood strategies (DFID 2001; Ellis 2000). Human capital is measured using indicators on the status of food security, dependency ratio, access to primary health and education services (section 4.6.1). The human population of Debre Mawi *kebele* was estimated at 8842 persons in 2013, of whom 4517 were females and 4325 males. There are 1907 farm households in the *kebele*, of which 1507 are headed by males, while the remaining 400 are female-headed households (Agegnehu 2013). The average family size is five persons per household. Households in the *kebele* experience neither transitory nor acute food insecurity. Food insecurity is thus not a serious constraint to human capital development. In addition, the young age dependency ratio is computed as 51.98, and that of the old age dependency ratio is 3.66, which makes the societal dependency ratio 55.64. This is closer to the dependency ratio of 38 for urban areas of Yilmana Densa *woreda* (see section 5.3.3) and 52 for urban areas of Amhara region (see section 5.2.2). However, it is much lower than the dependency ratio computed for the other case study *kebele* (see section 5.4.2) and rural areas of Amhara region (see section 5.2.2) and Yilmana Densa *woreda* (see section 5.3.3).

Human capital is enhanced through the provision of primary health and education services. The main diseases that jeopardize the health welfare of *kebele*'s population are malaria, tuberculosis and other lung diseases, intestinal parasites, diarrhoeal diseases, gastritis and duodenitis, and HIV/AIDS. Two health service infrastructures provide basic services to the residents of Debre Mawi. The public sector administers one health post, while the private sector runs one medium-level clinic in the *kebele*. However, access to modern education depends entirely on public sector educational infrastructures. The private sector does not provide kindergarten or primary education. The public sector administers one kindergarten, four first cycle primary schools (Grades 1 to 4), one full cycle primary school (Grades 1 to 8), three satellite schools, and three adult education centres to address the demand for formal education.

Physical capital

Physical capital refers to production inputs, physical infrastructure and production equipment, which enable people to undertake their livelihood activities. Proxy indicators such as access to the road network, telephone services, water services, improved seed varieties and ownership of farm implements are used to examine the status of physical capital (section 4.6.2).

Residents of Debre Mawi have direct access to an all-weather road network and telephone services. Ethiopian Telecom Authority has a sub-branch in the *kebele*, and households have access to mainline and mobile telephone services. The main highway that joins Bahir Dar and Addis Ababa passes through the *kebele*. This provides opportunities for households to use passenger trucks and lorries throughout the year. Moreover, direct access to an all-weather road network and telephone services integrates producers of agricultural products with markets and towns, and households are not confined to the one marketplace in the *kebele*.

Household access to drinking water depends on hand well and tap water infrastructures distributed across the three villages in the *kebele*. A total of 1671 households (87.62%) in the *kebele* have access to potable water (Agegnehu 2013). In addition, approximately 178 farm households (166 male-headed and 12 female-headed) have access to traditional irrigation infrastructures. A total of 1712, 1782 and 615 farm households had used improved seed varieties, chemical fertilizer and organic manure in the last cropping season, respectively. Approximately 232 households (226 male-headed and 6 female-headed) own one plough set with a pair of oxen (Agegnehu 2013).

Financial capital

Financial capital includes people's financial resources, such as savings, supplies of credit, pensions and remittances (DFID 2001). In this study, financial capital is measured by examining the sources of cash income and household access to credit services (section 4.6.3). In Debre Mawi *kebele*, cash income for household use is generated mainly from the sale of livestock and crop products. The main source of livelihood for 90 per cent of households is subsistence farming, while 10 per cent engage in petty trade. Rental of pack animals, fattening of livestock and sales of eucalyptus trees are becoming common activities as secondary sources of cash income. The numbers of farm households that diversified their livelihood towards livestock fattening and handcrafts are 387 and 75, respectively (Agegnehu 2013). This indicates the emergence of off-farm and non-farm activities as secondary sources of income in the *kebele*.

Households in the *kebele* have access to formal and informal sources of credit. Formal sources are the agricultural input loan (fertilizer and improved seed) provided in kind and the loan arrangements provided by ACSI. The agricultural input loan is tailored to the poorest of the poor to avail them of chemical fertilizer and improved seed verities. Borrowers of these in-kind loans are supposed to repay the principal and interest rate at crop harvest. ACSI is a microfinance agency that provides various types of credit and saving services to the residents of Debre Mawi. ACSI demands collateral, compulsory saving and group lending arrangements to dispense its credit schemes for off-farm and non-farm activities. The informal sources of credit are *equb*, moneylenders, relatives and friends. These informal sources of credit are tied up with many constraints and inconveniences (see section 5.2.5). The credit obtained from informal sources is used for urgent and unforeseen needs.

Natural capital

Natural capital refers to natural resources such as land, water and biological assets that used by people in pursuit of their livelihoods, including their flow and services. The landmass, along with surface and ground water sources, is the main natural capital from which the subsistence agricultural production is supported in Debre Mawi. Most of the *kebele*'s landmass (75%) is flat and gently sloping, which is suitable for ox-plough farming, while the remaining hillside (15%) and river gorge (10%) are more suitable for forest and bush. Approximately 87.96 % (2434 ha) of the landmass is used for cultivation of food crops. The difference between currently cultivable land (approximately 88%) and land for suitable ploughing (75%) shows a misallocation of 13 per cent of the landmass for crop cultivation that is used to be as forestland. The major cereal crops (teff, barley, maize, finger millet and wheat), pulses (faba bean, field pea, chickpea, and grass pea), oil crops (noug and linseed) constitute 91, 6 and 1 per cent of current cultivable land in the *kebele*, respectively. The remaining 2 per cent is allocated to vegetables and spices (Agegnehu 2013). The dominance of cereals, which are regarded as erosive crops that demand intensive use of animal and human labour, is highly significant in terms of the volume of production and the area of land under cultivation. The average farm plot is approximately 1.3 hectares per household. This is slightly higher than the regional average (1.13 ha) (section 5.2.2) and the average holding size of Densa Bahta *kebele* (1 ha) (section 5.4.2 below). This could be because of the larger area of the *kebele* (see Diagram 5.4), and relatively lower proportion of landmass allocated as forest and bush (see Table 5.1).

About 51 hectares (1.84 %) of the landmass in the *kebele* is covered with forest and bush and 146.25 hectares (5.28 %) is used for grazing. The remaining 135.75 hectares (4.90%) are built up and residential (Agegnehu 2013). This land-use classification shows that a small fraction of land is allocated to forestland compared with the average of Yilmana Densa *woreda* (see section 5.3.1) and approximately 8% of forest land in Densa Bahta *kebele* (see section 5.4.2). This could be because of the presence of a relatively higher number of farm households in the *kebele*, who depend on firewood for cooking (see Table 5.1 below). In addition, an increase in the number of farm households leads to the conversion of forestland into cultivation. The diminishing area of forestland has aggravated land degradation there (section 7.3). As well as their other uses, forest and bush cover reduce soil erosion caused by flood and run off. Obviously higher numbers of human beings and livestock leads to diminishing forestland. The proportion of land allocated for common pasture in the *kebele* is more than double the grazing land allocated in Densa Bahta *kebele* (see Table 5.1). This might be because of the presence of a relatively high numbers of livestock that support subsistence farming. In the *kebele*, the distribution of livestock population is 1830 oxen, 1244 cows, 756 bulls, 776 heifers, 923 calves, 2759 sheep, 157 goats, 912 donkeys, 60 mules, 18 horse and 3849 poultry. There are also 583 traditional and 31 modern beehives (Agegnehu 2013). There are two veterinary clinics (1 private and 1 public), which address current and emerging needs of livestock health.

Social capital

Social capital refers to formal and informal social resources or social relationships of people, such as family networks, membership of groups, relationships of trust and access to wider institutions of society. It includes social relations of trust, reliability and adaptability. People draw on these social resources when pursuing livelihood strategies (DFID 2001; Ellis 2000). Farm households in Debre Mawi *kebele* are organized formally under 59 development teams, and, on average, each team has 22 members (Agegnehu 2013). Households in the *kebele* have established traditional CBOs such as Idir, Equb, Mahiber, Senbete, Wenfel or Debo, and Yeferes Mahiber, and thus have a tradition of mobilizing the local economic resources for agricultural activities and conservation works. The main soil and water conservation structures in the *kebele* are graded bunds (soil, stone, stone-faced soil bunds) and check-dams (made of stone, wood, gabion and *kesha*). These structures have been built consistently in the last couple of years by mobilizing development teams in community asset-building undertakings (see sections 5.2.2 and 5.3.2). There is one multipurpose farmers' cooperative in the *kebele*, which provides modest services in agricultural input and product marketing.

Cultural capital

Cultural capital refers to the body of knowledge, stories, visions, myths and languages shared by people that provides a framework for the way in which they view the world and their proper role in it (Hackett 2006). The residents of Debre Mawi *kebele* have useful conservation practices that are culturally accepted. Farmers are usually afraid of cutting down old trees since local taboos and beliefs favour old trees *(kole)*. Because of these restrictive local beliefs, the community have maintained a few indigenous trees for genetic diversity. In addition, a recent practice prohibits free grazing of livestock on farm plots covered by terraces and other conservation structures. Furthermore, households have a culture of labour and livestock borrowing for mutually beneficial conservation. Moreover, women have a voice and participate in decisions associated with conservation investment. Agricultural extension workers substantiate this position since land certification has promoted gender equity that assures joint land ownership by spouses (see sections 1.5, 4.6.7 and 5.2.2). During the fieldwork, it was observed that men and women participated equally in the public campaign to cover sub-watersheds with conservation structures (see Pictures 7.3 and 7.4).

5.4.2 Status of livelihood assets in Densa Bahta *kebele*

Densa Bahta is the second rural *kebele* that was selected from Yilmana Densa *woreda* and considered in this research. It is situated off the main highway 7 km southwest of Debre Mawi. Residents of Densa Bahta walk for one and half hours to reach Debre Mawi and about two hours to Adet. The total area of Densa Bahta *kebele* is approximately 14.23 km^2 (1422.625 ha), and lies in the Weyna Dega topographic zone. The *kebele* receives an average annual rainfall of 1200 to 2200 mm and temperatures range from 8 to 26 $^{\circ}$C with an altitude ranging from 2226 to 2320 masl. Approximately 66, 29 and 5 per cent of the land in this *kebele* are covered with red, brown and black soils, respectively. The current land-use of the *kebele* is divided into cultivated land (87.05%), flooded and swampy areas (1.48%), grazing lands (2.46%), forest land (7.59%), and built-up and residential areas (1.4%) (Birhanu 2013). The *kebele* comprises six villages, namely Kidane Mihret, Dembash, Bahta, Mekane Tsiyon, Tengoba Kuskuam and Tengoba Abo.

The subsequent paragraphs discuss the status of six important livelihood assets in the *kebele*. This characterization entirely depends on the first-hand information gathered from the two agricultural extension workers of the *kebele* (see section 6.5.1). In addition, descriptions of the status of human, physical, financial, natural, social and cultural capital were made in line with the concepts and indicators used for Debre Mawi *kebele* (section 4.5.1 above).

Human capital

The human population of Densa Bahta *kebele* was estimated at 6493 persons in 2013, of whom 3289 are females and 3205 are males. There are 1241 farm households in the *kebele*, of which 989 are male headed and the remaining 252 are female headed (Birhanu 2013). The average family size is five persons per household. Households in the *kebele* experienced neither transitory nor acute food insecurity. However, the young age dependency ratio is computed as 95.38, and the old age dependency ratio is 3.21, which makes the societal dependency ratio 98.59. In other words, there are 99 persons in the dependent age groups for every 100 persons in the working ones. This is much closer to the dependency ratio of 84 for rural areas of Yilmana Densa *woreda* (see section 5.3.3) and 94 for rural areas of Amhara region (see section 5.2.2).

Access to health and education services plays an important role in enhancing human capital for sustainable livelihood outcomes. The main diseases that jeopardize the health welfare of the population are malaria, tuberculosis and all other lung diseases, intestinal parasites, diarrhoeal diseases, gastritis and duodenitis, and HIV/AIDS. This indicates the similarity of major health problems across the two case study *kebeles*, which is in line with the discussion on Amhara region (see section 5.2.3) and Yilmana Densa *woreda* (see section 5.3.3). The health infrastructure consists of three health facilities that provide basic services to the residents of Densa Bahta. The public sector administers one health centre and one health post in the *kebele*, while the private sector provides one medium-level clinic. This shows the participation of the private sector in providing health services to cope with current and emerging needs of preventive and curative healthcare of the community. However, access to modern education depends entirely on public sector educational infrastructures in Densa Bahta *kebele*. The private sector does not provide for kindergarten or primary education services. This is similar to the situation of Debre Mawi *kebele* (see section 5.4.1) and Yilmana Densa *woreda* (see section 5.3.3). The public sector administers one kindergarten, one first cycle primary school (Grades 1 to 4), one full cycle primary school (Grades 1 to 8), two alternative child education centres, one satellite school, three adult education centres and one secondary school (Grade 9 to 10) to address the demand for formal education.

Physical capital

Residents of Densa Bahta do not have direct access to an all-weather road network and telephone services. They are expected to travel an average of one and half hours on foot on the seven-kilometre seasonal road that joins the *kebele* with Densa Bahta to obtain these services. Absence of direct access to all-weather road and telephone services reflects the lack of integration of producers of agricultural products with markets and towns. Farm households are thus confined to one marketplace in the *kebele* for selling their agricultural products.

Household access to drinking water depends on six hand well infrastructures across the six villages in the *kebele*. Some 947 households in the *kebele* have access to potable water (Birhanu 2013). The percentage of households that have access to potable water is therefore about 76 per cent compared with Debre Mawi *kebele*, which has 88 per cent. In addition, approximately 593 farm households (584 male headed and 9 female headed) have access to traditional irrigation infrastructures. Thus the percentage of households that have access to traditional irrigation infrastructures is approximately 48% compared with Debre Mawi *kebele*, which is 9 per cent. A total of 1141 farm households (989 male headed and 152 female-headed) reportedly used improved seed varieties and fertilizer in the last cropping season (Birhanu 2013). This shows that all male-headed households and 100 female-headed households used improved seed varieties and fertilizer in the last cropping season. The percentage of farm households that used improved seed varieties and chemical fertilizer in the last cropping season was similar across the two case study *kebeles* (see Table 5.1 below). Approximately 602 households (585 male headed and 17 female-headed) own one plough set with a pair of oxen (Birhanu 2013). The percentage of farm households that own one plough set with a pair of oxen in this *kebele* is approximately fourfold that of Debre Mawi (Table 5.1).

Financial capital

In Densa Bahta *kebele*, cash income for household financial requirement in the *kebele* is generated mainly from the sale of livestock and crop products. The main source of livelihood for 90 per cent of households is subsistence farming, while 10 per cent of households engage in petty trade. This finding is consistent with the discussion on Debre Mawi *kebele* (see section 5.4.1), Yilmana Densa *woreda* (section 5.3.3), Amhara region (section 5.2.4) and Ethiopia (section 4.6). The number of farm households that diversified their livelihood towards fattening livestock, handicrafts, and petty trade was 825, 53, and 250, respectively (Birhanu 2013). This indicates the emergence of off-farm and non-farm activities as secondary sources of income. Households have access to formal and informal sources of credit. The formal sources of credit depend on the agricultural input loan (fertilizer and improved seed) provided in kind and loan arrangements provided by ACSI for off-farm and non-farm activities. Informal sources of credit include *equb*, moneylenders, relatives and friends. Credit from informal sources is used mainly to purchase foodstuffs and to cover medical expenses. During the fieldwork, it was learned that informal credit is not used for livelihood diversification or for sustainable land management practices in the case study *kebeles*.

Natural capital

The landmass, along with surface and ground water sources, is the main natural capital on which the subsistence agricultural production is supported in Densa Bahta. There are five rivers, five springs and two streams in the *kebele*. Most of the landmass (93%) is flat and gently sloping and is suitable for ox-plough farming, while the remaining hillside (5%) and river gorge (2%) are more suitable for forest and bush. In 2013, around 86.53 % (1231 ha) of the landmass of the *kebele* was used to cultivate annual crops, while 7.5 ha (0.52%) were used for perennial crops. The major cereal crops (teff, barley, maize, finger millet and wheat), pulses (faba bean, field pea, chickpea, and grass pea), oil crops (noug and linseed) constitute 91, 4, and 1 per cent of the current cultivable land in the *kebele*, respectively. The remaining 4 per cent is allocated to vegetables and spices (Birhanu 2013). The dominance of cereals, which are regarded as erosive crops that demand intensive use of animal traction and human labour, is highly significant in terms of the volume of production and the area of land under cultivation. The average farm plot per household is approximately one hectare. This is slightly lower than the regional average (1.13 ha) (section 5.2.2) and the average holding size of Debre Mawi *kebele* (1.3 ha) (section 5.4.1). This could be because of the relatively smaller area of the *kebele*. The total area of Debre Mawi *kebele* (27.67 km^2) is almost twice that of Densa Bahta *kebele* (14.23 km^2) (see Diagram 5.4).

Approximately 35 hectares (2.46 %) of the landmass is used for grazing. About 108 hectares (7.59 %) are covered with forest and bush. Roughly 21 hectares (1.48 %) have deteriorated because of gully erosion or are covered by flood and swamp, and are classified as useless land. The remaining 20 hectares (1.4%) are built up and residential (Birhanu 2013). This land-use classification shows that a relatively higher fraction of land is allocated to forestland in this *kebele* compared with Debre Mawi *kebele* (see Table 5.1 below). Approximately 7 per cent of the land is allocated to forestland in Yilmana Densa *woreda*, which is slightly lower than the allocation in Densa Bahta *kebele* (section 5.3.1). Though farm households in both *kebeles* depend on firewood for cooking, the forestland is this *kebele* may possibly be higher because of the relatively smaller human and livestock populations. The proportion of land allocated for built up and residential purposes is much lower than that in Debre Mawi *kebele* (4.9%). Likewise, the proportion of land allocated for common pasture is much lower than that in Debre Mawi (see Table 5.1). The livestock population includes 1090 oxen, 873 cows, 353 bulls, 402 heifers, 490 calves, 1217 sheep, 75 goats, 397 donkeys, 84 mules, 53 horses and 2044 poultry. There are also 315 traditional and 32 modern beehives (Birhanu 2013). This livestock population is relatively smaller than that of Debre Mawi *kebele*. Similar to Debre Mawi, there are two veterinary clinics (1 private and 1 public) in Densa Bahta to address current and emerging of livestock health needs.

Social capital

Farm households in the *kebele* are organized formally under 39 development teams. On average, each team has 25 members (Birhanu 2013). Households in the *kebele* have also established traditional CBOs such as *idir, equb, mahiber, senbete, wenfel* or *debo,* and *yeferes mahibe* in order to mobilize the local economic resources for agricultural activities and conservation. The main soil and water conservation structures are graded bunds (soil, stone, stone-faced soil bunds) and check-dams (made of stone, wood, gabion and *kesha*). These structures have been built persistently in the last couple of years by mobilizing the development teams in community asset-building endeavours (see sections 5.2.2 and 5.3.2). As in Debre Mawi, there is one multipurpose farmers' cooperative, which provides modest services in agricultural input and product marketing.

Cultural capital

The residents of Densa Bahta *kebele* have useful conservation practices that are culturally accepted. Farmers are usually afraid of cutting down old trees since local taboos and beliefs favour old trees (kole). Because of these restrictive local beliefs, the community has maintained some indigenous trees for genetic diversity. There is also the practice of *gelbito mares,* in which crop residues are used as an organic fertilizer instead of allowing livestock to graze freely. This cultural capital is compatible with the recent administrative obligation imposed on local farmers that prohibits free grazing of livestock on farm plots covered by terraces and other conservation structures (see sections 5.2.2 and 7.6). In addition, households have a culture of labour and livestock borrowing for mutually beneficial conservation works. Moreover, women have a voice and participate in decisions associated with conservation investment.

To sum up, farm households in both Debre Mawi and Densa Bahta are operating within a homogeneous agro-ecological and socioeconomic environment. The status of livelihood assets and strategies in the two *kebeles* is similar, except for minor distinctions (see Table 5.1 below).

Table 5.1 Comparison of selected livelihood asset indicators across the case study *kebeles*

Capital or Asset type	Selected indicators	Debre Mawi	Densa Bahta
Human Capital	Total number of farm households	1907	1241
	Percentage of female headed households	20.9	20.3
	Average family size per household	5	5
	Societal dependency ratio	56	99
Physical capital	Percentage of households who have access to potable water supply	87.62	76.30
	Percentage of farm households who have access to traditional irrigation	9.33	47.78
	Percentage of farm households who used improved seed varieties in the last cropping season	89.77	91.94
	Percentage of farm households who used chemical fertilizers in the last cropping season	93.44	91.94
	Percentage of farm households who used organic manure in the last cropping season	32.24	Not available
	Percentage of farm households who own one plough set with a pair of oxen	12.16	48.50
Financial capital	Percentage of farm households who diversified their livelihood towards livestock fattening	20.29	66.47
	Percentage of farm households who diversified their livelihood towards handcrafts	3.93	4.27
	Percentage of farm households engaged in subsistence farming	90	90
Natural capital	Average farmland owned per household (in hectare)	1.3	1
	Percentage of land allocated for communal grazing land	5.28	2.46
	Percentage of land allocated for forest	1.84	7.59
	Percentage of land used for crop cultivation	87.96	87.05
Social capital	Number of development teams organized in the *kebele*	59	39
	Number of agricultural cooperatives found in the *kebele*	1	1

Farm households in both case study *kebeles* are endowed with similar livelihood assets or capitals. However, the societal dependency ratio of Debre Mawi (56) is lower than that of Densa Bahta (99). This may imply that the productive labour force of Debre Mawi is migrating to other areas because of better access to road and communication infrastructure. It also seems that the labour force is migrating because of push factors associated with physical capital, financial capital and natural capital. Around 48 per cent of farm households in Densa Bahta have access to traditional irrigation systems, as opposed only 9 per cent in Debre Mawi. In addition, only 12 per cent of farm households in Debre Mawi *kebele* own one plough set with a pair of oxen compared with 49 per cent of households in Densa Bahta. Moreover, the percentage of farm households that diversified their livelihood towards livestock fattening is around 66 per cent in Densa Bahta compared with 20 per cent in Debre Mawi. However, the average farmland owned per household in Densa Bahta *kebele* (1 ha) is slightly lower than that possessed by households in Debre Mawi *kebele* (1.3 ha).

Overall, equal proportions (90 per cent) of farm households in the two *kebeles* are engaged in subsistence farming. This is consistent with the discussions about Yilmana Densa *woreda* (section 5.3.3), Amhara region (section 5.2.4) and Ethiopia (section 4.6). This reveals that the case study *kebeles* could be regarded as typical in which a significant proportion of farm households are engaged in subsistence farming. They derive their livelihoods from natural resource-based activities to utilize on-farm and off-farm resources. Their access to these resources is mediated by the outside world, which allocates the means of production and distribution of outputs. Almost equal proportions of land are allocated to crops in the two *kebeles* (see Table 5.1 above). Cash income for household financial requirements is generated from the sale of livestock and crop products in both *kebeles*. Indeed, Table 5.1 indicates the emergence of off-farm and non-farm activities as a secondary source of income in both *kebeles*. The formal and informal sources of credit, as well as social and cultural capitals, are similar in both *kebeles*. The livelihood assets and strategies in the case study *kebeles* is, therefore, in line with Diagram 5.5 below, which illustrates a simplified version of resource flow in a typical Ethiopian farm household.

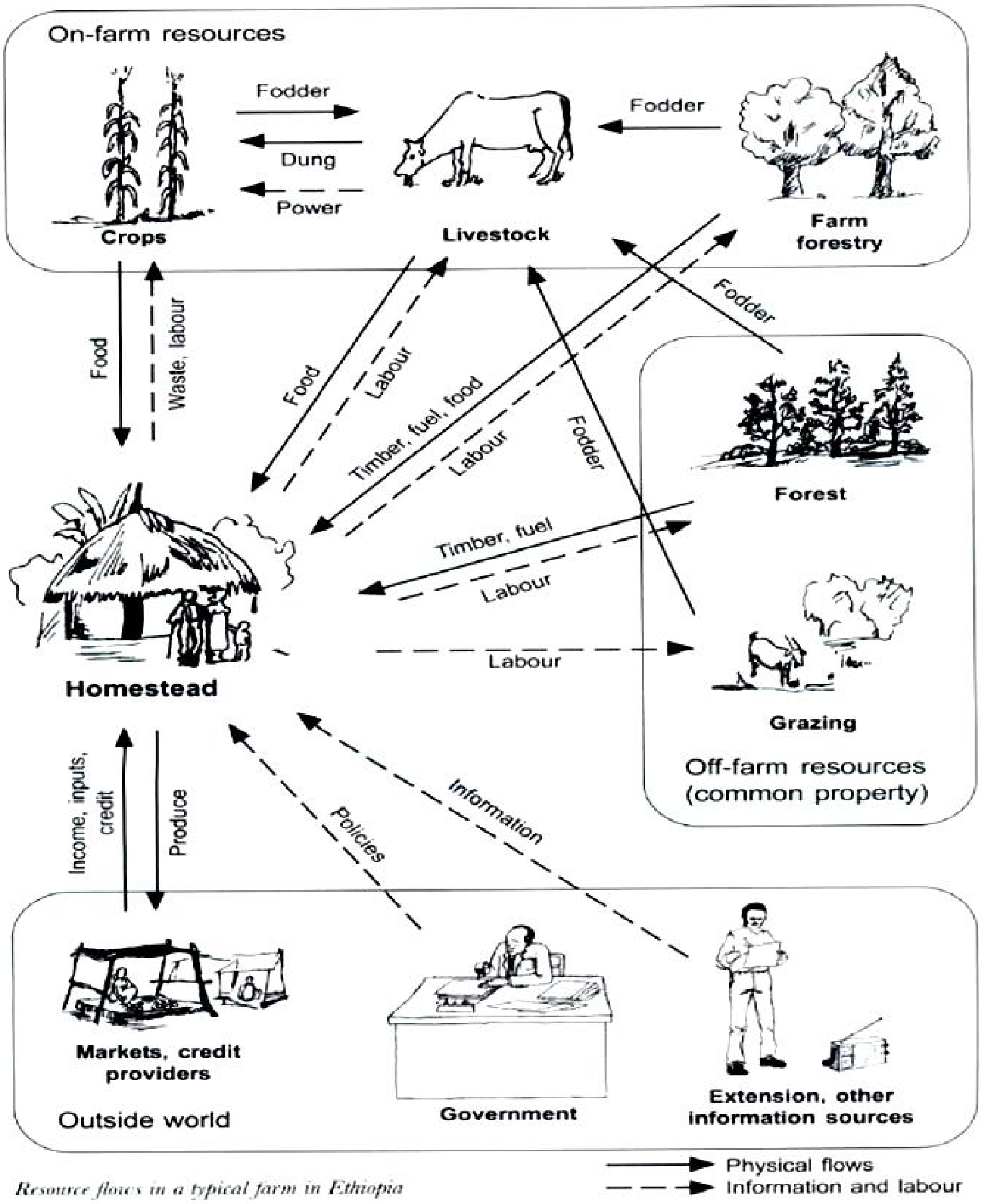

Diagram 5.5 Resource flow in a typical farm in Ethiopia

Source: WSP International Sweden AB in association with ORGUT Consulting AB of Sweden, Norplan of Norway, Haddis Consult and Shebelle Consulting Engineers of Ethiopia (2009:16)

5.5 Conclusion

Chapter 5 extracted literature to provide descriptions of the location, biophysical and demographic settings of Amhara region. This was followed by examining various contextual aspects of food insecurity, household livelihoods such as the nature of the cropping system, and the status of off-farm employment opportunities, the availability of infrastructure and social services, and the extent of government development interventions and of land degradation in the study region. Broadly speaking, the chapter underscores that the majority of rural households in Amhara region derive their livelihoods from natural resource-based activities, while the level of land degradation is frighteningly high for several reasons.

The chapter also provided a characterization of Yilmana Densa *woreda* and the two case study rural *kebeles*. The discussion focused on the location and biophysical environment, demographic and livelihood settings, and administrative structure of the *woreda.* This was followed by a discussion of the status of livelihood assets in the case study rural *kebeles*. Therefore, the chapter provided basic information about the research sites to offer a contextual appreciation of the methodology and findings. Chapter 6 details the research methodology employed in the study, as well as the philosophical perspectives that informed the choice of research methods. Chapter 7 presents the results of the study and an analysis of the findings, given the farming system, livelihood strategies and status of livelihood assets in the case study areas that appeared in this chapter.

CHAPTER SIX: RESEARCH METHODOLOGY

6.1 Introduction

The purpose of chapter 6 is to discuss the research design and methodology used in this study and to explain the overall process of the research. It details the methodology employed in the study, as well as the philosophical perspectives that informed the choice of research design and methodology. Section 6.2 provides a brief on the research design and rationale for the selected methodological procedures. This is followed by an examination of the research paradigm debate to enhance the reader's appreciation of the methodology and findings of this particular research. Section 6.4 presents the sampling procedures used to select the study sites and respondents of the research project. Section 6.5 provides brief explanations of the tools and techniques that were employed to gather rich data from multiple sources. It also presents the ethical issues that were taken into consideration, methodological limitations and strengths (in sections 6.6, 6.7 and 6.8, respectively). Section 6.9 describes the method of data analysis. The last section provides a conclusion to the chapter.

6.2 Research design and rationale

A number of factors were taken into account in the design of the research. These include the sensitivity of the research topic, limited resources for the study, the need for adequate data gathering, suitability of data for processing and analysis, and credible contribution to knowledge. The researcher's intent towards the process of knowledge construction was also considered. Three interrelated factors, namely ontology, epistemology and methodology, determine the process of any research (Denzin & Lincoln 2003). Ontology is concerned with the basic question 'What actually exists?' Social analysts provide different answers to this question. Epistemology is concerned with theories of knowledge construction by questioning whose knowledge is validated and what constitutes knowledge. It is the philosophy of knowing, the construction and authentication of certain forms of knowledge. The basic epistemological questions are 'Do we really know what we think we know?' and, if so, 'How do we know what we know?' The methodology is concerned with the specific tools and techniques of the research (Mikkelsen 2005; Daly 2000).

The basic epistemological questions of this study arose from the intent to analyse and understand the relationship between land titling and sustainable use of farmlands in order to partially fill in the knowledge gap. This knowledge gap was confirmed during the research proposal writing stage in which over 80 publications were consulted using the snowball-sampling technique. Eventually, the literature search was consolidated using the electronic database search of EBSCO through UNISA online library in June 2011. Keyword combinations of ‘land’, ‘tenure’ and ‘sustainable use’ were used to search for peer-reviewed journal articles published in English from January 1980 to May 2011. Over 200 peer-reviewed journal articles were selected for an extensive review by reading the relevancy of abstracts in line with the focus and goal of the research (Randolph 2009:4-7). Then, a spreadsheet catalogue and coding book were prepared to extract and evaluate the information of those articles that met the inclusion criteria. Moreover, supplementary and up-to-date literature was consulted during the study period. Chapters 2 and 3 presented the theoretical and analytical foundations that informed the basic epistemological questions of this research.

The researcher opted for qualitative research methodology in which a case study design was used (Babbie 2010; Creswell 2009; Sarantakos 1998) to deal with the epistemological questions and constraints considered in the design of the research. Qualitative research methodology is favoured since the epistemological questions call for a complex and detailed understanding of the issue at micro level (Babbie 2010). This is achieved by undertaking an interactive process over time with local farmers and development practitioners, unencumbered by what one expects to find or have read in the literature. In addition, a process that allows individuals to share their stories and hear their voices by minimizing the power relationships between the researcher and study respondents was applied through qualitative inquiry (Creswell 2009). Moreover, the case study design allows for the application of techniques that help to improve data reliability and validity, which is commonly affected by the subjective nature of qualitative data (Sarantakos 1998). The primary data were collected using techniques such as participatory observation, FDGs and individual interviews. Except for developing instruments for these participatory data gathering techniques, the researcher did not attempt to influence the knowledge validated by the research respondents. Statistical data were also gathered from secondary sources to backup qualitative understanding of the extent and patterns of change in social processes over time.

Overall, the design of this study was guided by 'several field research paradigms' (Babbie 2010:303) to observe and understand both qualitative and quantitative data. Certainly, emphasis was given to adopting a framework and procedures that 'produce descriptive data, presenting in the respondents' own words their views and experiences' (Sarantakos 1998:46). Robson (1993:52) notes, 'case study is a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence'. In the same vein, techniques that were flexible, with qualitative design, purposive sampling and 'naturalist' enquiry (Sarantakos 1998:45) were used to generate data from multiple sources. Bearing in mind the common criteria for case study and qualitative research design such as 'openness', 'communicativity', 'naturalism' and 'interpretability' (Sarantakos 1998), the research process aimed at joint process and outcome, so that knowledge is validated by all those involved in the research process, and not by the researcher in isolation. This contrasts with conventional research, where the researcher-respondent relationship is vertical and defined by the authority of the researcher. 'The researcher is the expert – the one who 'knows' – and is accorded almost total power over the research situation' (Daly 2000:65). Therefore, the research process was undertaken in 'an open and flexible manner with social action in its natural setting' (Sarantakos 1998:193) to uncover social processes of conceptualization and shared meaning (Babbie 2010:299-303; see also Yin 2003:13). Indeed the research process is subject to a number of criticisms of the research paradigm debate, which are discussed in the next section.

6.3 Research paradigm debate

Research is fundamentally about generating knowledge, which involves one's understanding of 'why and how things work or should work' (Kaniki & Mphahlele 2002: 3). The generation of such knowledge usually takes place within some framework of thinking or philosophy called a research paradigm (Babbie 2010; Creswell 2009). A paradigm can be defined as the 'basic belief system or worldview that guides the investigation' (Guba & Lincoln 1994:105). The philosophical underpinnings that inform research paradigms are grounded in three interrelated factors such as ontology, epistemology and methodology (discussed in section 6.2 above). Broadly speaking, ontological, epistemological and methodological assumptions frame the nature of the research and the role of the researcher in the scientific inquiry. In the search for an appropriate research paradigm, these three factors were used to examine four paradigms before opting for the one that resonates most with the researcher's interests and personal belief system.

6.3.1 Positivist paradigm

The positivist paradigm is considered the conventional approach to scientific research and has a long history. It arose from nineteenth-century scholars such as Auguste Comte, John Stuart Mill and Emile Durkheim. The aim of research in the positivist paradigm is to find generalities and regularities that can be applicable to social life with the same certainty as natural laws such as gravity. In view of this, social science research attempts to find casual laws of human behaviour with the help of various models. For example, 'rational-choice' models of legal compliance suggest that criminalization reduces through restricted drug availability, increased drug prices, and the deterrent effect of the risk of punishment. The ontology of positivism is rooted in stable external reality and existence of law-like regularities in social life that can be discovered free of bias by applying a strict methodological protocol. This presupposes that there is a fixed universe that can be described accurately by identifying cause-effect relationships, so that scientific inquiry can be used as a basis for predicting and controlling natural phenomena or social world. It is also assumed that the true nature of reality can be obtained only by testing theories about actual objects, processes or structures in the real world. Since facts have an existence separate from theory and values, the empirical mismatch between theory and facts calls for a revision of the theory to better predict reality (Angen 2000:280–281; Cohen & Crabtree 2006:3; Creswell 2009:25; Guba & Lincoln 1994; Stringer & Genat 2004).

Epistemologically speaking, consistent positivists assert that any knowledge claim or scientific explanation must be arrived at through the 'verifiability principle' of the early logical positivists or the 'testability principle' of later logical empiricists. The epistemology of positivism rests upon nomothetic explanation and deductive reasoning. The accepted epistemology of positivism constrains the researcher to be objective, value free, detached, and a neutral observer in the research process. The researcher explains why social life is the way it is by discovering regularities and causal laws. The researcher can also study parts of reality and then add the fragments together. This reductionism is guided by atomism and mechanism principles that view a system as comprising unchanging parts with fixed relationships that can be discovered by breaking down the various components. Methodologically, the positivist relies mainly on experimental and manipulative methods, the generation and testing of hypotheses, as well as more quantitative methods. As a result, positivists and post-positivists favour surveys to identify and quantify variables involved in social life and to postulate relationships between them; experiments to test causal relationships between variables; studies typically designed around a hypothesis about the correlation between variables; measurements to obtain quantitative data; statistics to determine conclusions; rules to eliminate bias and control for subjectivity; and large samples to be able to generalize (validate) the empirical findings. Therefore, they contend that a research should be done by an expert following an instrumentalist orientation in order to generate knowledge that can be used to master, control or change events in the world (Angen 2000:281; Cohen & Crabtree 2006:7; Creswell 1998:197; Creswell 2009:25; Guba & Lincoln 1994).

Critics of the positivist paradigm (Angen 2000; Cohen & Crabtree 2006; Guba 1989) argue that the paradigm reduces people to numbers. It is concerned with abstract hypotheses instead of lived realities, and research can never be value free. The process of scientific inquiry can never be devoid of subjectivity and we cannot, as the positivists would maintain, separate ourselves from what we know. Therefore, the tendency of positivist research to predict and generalize findings is inconsistent with the reality that knowledge is a human construction that varies depending on the context. Indeed, empirical evidence shows that some of the predictions using the positivist approach do not come true in real life. For example, the positivists' faith in markets and technology to solve social and environmental problems has proved to be incorrect, as evidenced by the increasing social and environmental crises that cannot be solved by mere technology and market forces (Norgaard 1994:32).

The shortcomings of the positivist/post-positivist paradigm gave rise to other ways of generating knowledge of which the prominent ones are interpretivism, social constructionism and critical/standpoint paradigms. The next sub-section examines the position of interpretivism paradigm.

6.3.2 Interpretivism paradigm

The aim of research in this paradigm is to move away from abstract explanation to everyday lived experience and understanding of social life. It attempts to zoom in on how people construct meaning by interpreting the experiences of daily life. The ontology of the interpretivism paradigm rests upon the belief that the social world depends largely on what people perceive of external phenomena based on internal reality and subjective experience of individuals. This ‘relativist’ ontological assumption contends that social world is produced and reinforced by individuals through their action and interaction (Andrade 2009:43-44; Angen 2000:385).

Epistemologically speaking, consistent interpretivists assert that any knowledge claim or scientific explanation must be arrived at through understanding of the social world from the participants’ perspective, through interpretation of their meanings and actions. Their epistemology also assumes that researchers’ prior assumptions, beliefs, values, and interests always intervene to shape their investigations (Creswell 2009:26). The epistemology of interpretivism rests upon ideographic explanation and inductive reasoning. This calls for empathic observation and deep reading in order to discover meanings, analysing details of meaning and seeking connections (Andrade 2009:44; Angen 2000:386). The role of the researcher is thus assumed to be interactive with the human subjects of the enquiry in a research process that ultimately changes the perceptions of both parties (Angen 2000:390).

Methodologically, interpretivists rely mainly on interactional, interpretive, and qualitative approaches (eg ethnography, phenomenology, symbolic interactionism) in which values and subjectivity are regarded as integral to inquiry (Creswell 2009:26). Though choice of method is often seen to be neutral, interpretivists look at individuals or small groups rather than surveying large groups. They commonly use in-depth case studies, in-depth interviews, observation and interpretation of documents and artefacts in their search for rich and detailed information (Andrade 2009:45-46; Angen 2000:391). Therefore, the interpretivist paradigm contends that research should be done by a researcher who appreciates the diversity of human experience through adoption of neutral methods in order to understand inner or subjective experiences of people within their context or lived reality. It posits that generative mechanisms identified for phenomena in the social sciences (that is, the relationship between theory and practice) should be viewed as ‘tendencies’, which are valuable in explanations of past data, but not wholly predictive for future situations. Critics of the interpretivist paradigm (Angen 2000; Cohen & Crabtree 2006) argue that the paradigm allows for limited generalization of research findings (critique from positivism), and the essentialist claim for the inner life of people (social constructionist critique), and does not take structural and political issues into account (critical/standpoint critique).

6.3.3 Social constructionism paradigm

The aim of research in this paradigm is to understand the construction of meaning through social, discursive and political processes and interactions (at micro and macro level). Moving away from a focus on individuals to social relations, the constructionist shows how particular phenomena are constructed through power relations, along with highlighting historical and social contingency of particular issues. The social constructionist believes that realities exist in the form of multiple mental constructions, which are socially and experientially determined and location specific. Consequently, there are many interpretations that can be made in any inquiry, depending on the context (Cohen & Crabtree 2006:5; Foley & Valenzuela 2005:221; Guba & Lincoln 2005:197).

Ontologically, the constructionist adopts a position of relativism for socially constructed reality or discourse. The basic ontological assumption is that reality is not fixed, but socially constructed through language and social practices (Creswell 2009:26; Guba & Lincoln 2005:195). Greater emphasis is given to the language-driven (textual) discourse that posits the social nature of meaning making and research-based knowledge. This presupposes that facts are socially determined and what we see as 'facts' depends to some degree on how we look at reality, which in turn is shaped by our socio-historical situations (Foley & Valenzuela 2005:222-224).

Epistemologically, the constructionist adopts a subjectivist position and argues that subjectivity is part of our human nature. Besides, if realities exist only in the respondents' minds, subjective interaction seems to be the only way to access them (Guba 1989). In addition, as researchers, our modes of description, explanation and representation are derived from social relationships, including power relations. This presupposes that research is a political activity because as we describe, explain or represent, we have an impact on reality (Cohen & Crabtree 2006; Creswell 2009; Foley & Valenzuela 2005). The accepted epistemology of social constructionist immerses the researcher in reflexivity, since 'knower is part of what is known', and depends on inductive reasoning and deep reading in order to highlight discursive constructions and power relations (Creswell 1998:32; Guba & Lincoln 2005:197).

Methodologically, the social constructionist proceeds in ways that identify the various constructions and bring them to as much consensus as possible. This process, according to Guba (1989: 26), has two aspects: hermeneutics and dialectics. The hermeneutic aspect focuses on depicting individual constructions as accurately as possible, while the dialectic aspect consists of comparing and contrasting these constructions, such that each respondent is confronted with the constructions of others and comes to terms with them. Consequently, the hermeneutic/dialectic methodology seeks to produce as informed and sophisticated a construction or constructions as possible (Guba & Lincoln 2005:201). Alongside this, the methodology aims to keep channels of communication open so that that there can be continuous building on the knowledge attained. Emphasis is placed on language-driven (textual) data derived from transcriptions of interviews or from texts such as newspapers. The accepted data analysis techniques are deconstruction, discourse analysis and narrative analysis in order to highlight the historical and social contingency of particular issues (Creswell 2009:26).

The major critiques (Guba & Lincoln 2005) forwarded to the social constructionism paradigm includes these aspects. It is difficult to show population-wide regularities empirically (critique from positivism); the individual may be seen as the dupe of social systems (critique from interpretivism); and relativism ontology may not be applicable in a social world where one discourse simply replaces another (critique from critical/standpoint position).

6.3.4 Critical/standpoint paradigm

The aim of research in this paradigm goes beyond surface illusions to uncover structures of the material world that are disempowering people. Proponents of critical theory believe that the aim of scientific inquiry is not simply to understand, but to change the social world. The ontological assumption of critical research is that of a 'historical realist', which sees an empirical reality independent of perceptions or language. Critical researchers contend that the reality has three layers: empirical (what we observe, hear, sense); real (social structures); and actual (causal mechanisms) (Guba & Lincoln 2005; Kincheloe & McLaren 2005).

Epistemologically, critical researchers assume that the social reality is historically constructed, produced and reproduced by people with power to maintain their hypocrisy (Kincheloe & McLaren 2005:304). People with power are expected to create and transmit 'false consciousness' to maintain the superiority of their worldviews. Critical researchers assume inter-subjective objectivity in a world in which all science is regarded as value laden (Guba & Lincoln 2005:204). They contend that researchers must go beyond careful observation and dig beneath surface relations (myth, ideology, distortion) to uncover deeper levels of reality. Critical researchers recognize that the ability of people, particularly the oppressed, to change their social or economic conditions is constrained by various forms of dominant forces. These forces must be exposed through critical research in such a manner that the consciousness of the participants is raised so that they act in ways that can transform or change the social order to reflect equity and justice (Creswell 2009:26; Foley & Valenzuela 2005; Kincheloe & McLaren 2005:304).

Proponents of critical theory believe that nature cannot be seen as it 'really is' or 'really works', except through a value window (Guba 1989: 24). In other words, the social constructions of people are shaped by their environment and values. Consequently, the findings of the study can vary, depending on the values chosen, thereby making inquiry a political act in the service of particular purposes (Cohen & Crabtree 2006:7; Creswell 2009:27).

The argument of the critical theorist that posits that the values of an inquirer could influence the outcome of knowledge generated implies the ontology of critical realist and subjectivist epistemology. The role of the researcher should be transformative, and research must improve social conditions. Initiating change in social relations and practices, as well as helping to eliminate the bases of alienation and domination, is believed to be achieved by helping people to understand the historical and structural elements of their disempowerment. The credibility of research thus depends on addressing these two important questions (Guba & Lincoln 2005:205-209):

- Does the research penetrate the surface level to reveal conditions generated by underlying structures?
- Does the research shift understandings and provide insights into how engaging in social-political action may improve conditions of people's lives?

Methodologically, the critical/standpoint paradigm is openly ideological and does not strive to reduce bias. It aims at empowerment through participatory research, critical action research, and critical ethnography methods (Guba & Lincoln 2005:203). These methods rest upon deductive, inductive and abductive reasoning (repeated evaluations of ideas and data based on applying alternative rules or schemes). A dialogic approach is therefore adopted; one that seeks to eliminate the false consciousness of participants by rallying them around a common point of view. In this process, features of the (real) world are examined and judgments made about these features can be altered (Creswell 1998; Creswell 2009).

The major criticisms of the critical/standpoint paradigm are that it cannot be objective because the research takes an overtly ideological stance (critique from positivism); the subjective experience of individuals is lost (critique from interpretivism); and power relations are more subtle and dynamic than is implied by a structural analysis (critique from social constructionism).

To sum up, ontology involves the philosophy of reality, epistemology addresses how we come to know that reality, and methodology identifies the particular practices used to attain knowledge of it. The research paradigm debate discussed in this section highlights the discourse on the supremacy of one research perspective over others, especially the 'quality of research or knowledge claims'. The positivist position ontologically assumes 'naïve' or 'minimal realism' and a belief that only observable things are real and worthy of study. Epistemologically speaking, consistent positivists assert that any knowledge claim or scientific explanation must be arrived at by means of objective observation. The epistemological rhetoric of the critical research paradigm suggests that objective observation is impossible, and that all knowledge is generated or justified in the context of the researcher's framework and assumptions. There are clear similarities between the critical theory, interpretivist and social constructionism research paradigms. All three include the epistemological notion that objective observation is not possible. However, interpretivism includes the additional notion that human experience is a process of interpretation of meanings and actions, that social reality is relative to the observer, and that everyday concepts need to be understood and interpreted to create specific knowledge about the social world. Another basic difference between critical and interpretivist research is the transformative nature of critical research, implying a focus on changing the status quo (for example related to emancipation and empowerment), whereas interpretivist research can be regarded as more 'neutral' and descriptive in this sense. The choice of method for this thesis was underpinned by a desire to acquire knowledge and understanding through interactive research that acknowledges the important role of the participants in the research process. The aim is to develop knowledge through the understanding of respondents' individual and collective reflection of events, which suggests a qualitative research approach underpinned by interpretivist perspective. Details of research techniques and tools adopted for data collection and analysis are explained and defended in subsequent sections of the chapter.

6.4 Site and respondent selection

A purposive or judgmental sampling technique was applied to select both the study sites and respondents. This is because a standard statistical probability sampling technique is not a key requirement of qualitative research design (Babbie 2010; Sarantakos 1998) and interpretivism inquiry (Andrade 2009; Angen 2000; Creswell 2009). The research followed non-probability sampling design, since the research design was intensive and sought depth of understanding rather than breadth. Thus, the two case study sites and three groups of farmers in each site were selected purposively for comparison. The next two subsections provide a brief explanation of the procedures followed in selecting the study sites and respondents of the research project.

6.4.1 Selection of study sites

In this research, the task of purposively selecting the case study sites (rural *kebeles*) passed through three stages. The first stage involved selecting a regional state that was suitable for this particular study. Of the four major regions of Ethiopia that pursued a land certification and registration scheme, Amhara region was purposively selected because of the severity of land degradation documented in the literature (see sections 1.5 and 5.2.2). Amhara region is located in northwestern Ethiopia, where historically agricultural lands have experienced extensive cultivation and relatively high soil degradation. The Amhara ethnic group, the religion of Orthodox Christianity, and a mixed farming system dominate the region. The second stage involved selecting one *woreda* (district) from 150 in the region. Three prominent factors dictated the purposive selection of Yilmana Densa *woreda*: i) it was a good agricultural potential area that produced surplus food grain a decade ago, though it consists of food insecure households these days; ii) the researcher's knowledge of the local dialect and culture was considered to minimize 'the problem of reactivity' (Babbie 2010:300) with study respondents to do an intensive qualitative field research; and iii) the presence of Adet

Agricultural Research Centre in the *woreda* made access to and availability of credible secondary data easier.

The last stage involved selecting two case study sites *(kebeles)* from Yilmana Densa *woreda*. The criterion of 'certified' versus 'uncertified' land holding was not applicable since all rural *kebeles* in the *woreda* and approximately 97 per cent of farmers in the constituency were provided with provisional land certificate during the study period. The purposive selection of convenient *kebeles*, which is based on their proximity to the researcher's permanent residence in a virtually homogeneous geographical area, was done with a topographic map. A topographic map of the *woreda* was used to select the two case study sites (rural *kebeles*): Debre Mawi and Densa Bahta. Debre Mawi is steeper and was expected to have a shortage of arable land and higher land degradation. Densa Bahta is flat and was expected to have relatively better availability of arable land and less degradation. Thus, the main criterion used to select the study sites based on topography has scientific validity to undertake a 'comparative case study' (Babbie 2010:311) in a qualitative field research design.

The two case study sites *(kebeles)* form the empirical base of the study in which data were gathered from three groups of farmers (grouped according to their farming practice; see section 6.4.2 below). Comparative analysis based on the data gathered from study respondents was done in two stages to address the two research questions set by the thesis. In the first stage, the researcher compared and analysed the underlying determinants of land tenure security and sustainable use of farmlands in the two sites. In the second stage, the researcher compared the three groups of farmers in terms of their views, knowledge and attitudes towards land tenure security and sustainable use of farmlands. Finally, the researcher generalized variables and factors that affect the sustainable use of farmlands in the context of Amhara region with the aid of a generic analytical framework (see section 3.4).

6.4.2 Selection of study respondents

The sampling frame for this particular study comprised all male farmers who received a land certificate for the farmland they cultivate in the study *kebeles*. Thus, the sampling frame excludes all female farmers, landless households, and farmers who did not receive a land possession certificate. Male farmers were purposively chosen for FGDs and in-depth interviews to control the effects of gender[103] on household land management practice and the land tenure security perception index used in the study. Another reason for selecting only male farmers is that most (80%) farm households in the study *kebeles* are headed by men (see Table 5.1).

During the preparatory field visit, the lead researcher, in collaboration with agricultural extension agents (five men and one woman) and land administration workers (two men), set the criteria for classifying farmers based on their land management practices. Farmers were categorized into three land management practices because of their performance in the previous five years. High performers were those farmers who undertook the construction and maintenance of various types of terraces on their holdings. Moderate performers were those who constructed, but did not maintain various types of terraces on their holdings. Low performers were those who had neither constructed nor maintained any type of terrace on their holdings in the past five years. High performers were those farmers that followed sustainable land management practice, whereas low performers were those farmers that followed unsustainable farming practice. Moderate performers were those farmers that took an intermediate position towards sustainable land management practice.

After setting the criterion to classify farmers into three groups of land managers, the lead researcher and field assistants[104] deployed in each study *kebele* undertook transect walks. Transects are cross-sectional diagrams of the site constructed during a joint walk to observe, discuss and register endowments and problems (Mikkelsen 2005:90). The transects of each *kebele*, which were prepared by the lead researcher and field assistants from each *kebele*, served as the base to select the majority of study respondents. Field notes taken during transect walks were used to select study respondents using farm-plot sampling instead of a household sampling technique. The household sampling technique is often used in surveys to select respondents through standard statistical probability sampling. In contrast, respondents were selected purposively based on their land management practice on a particular farm plot in this research study. During the joint transect walk in the selected *kebeles*, proper notes were taken

[103] A large body of literature (eg Amare 2002; Barbier et al 1997; Beshah 2003; Pender & Gebremedhin 2007; Perrt & Stevens 2006) documents that land owned and operated by female-headed households tends to be poorly managed since these households face several socioeconomic constraints.

[104] Following a formal communication with the *woreda*- and *kebele*-level authorities, the researcher deployed two men as field assistants per site, based on the nominations of agricultural extension workers in the study *kebeles*. The four field assistants were unemployed youths who had completed their secondary school education and had rich information as members of the study community.

of the names of plot holders, their wealth strata, and judgment of observed land management practice with regard to the status of farm-plot management. This was supplemented by the judgment of *kebele*-level development workers to obtain the required number of study respondents. Care was taken to select as many diverse study respondents as possible for individual and FDGs. This diversity was maintained based on study respondents' land management practice, which was categorized as high, moderate and low during the preparatory field visits. Thus, non-probability sampling was used to draw equal numbers of study respondents from three land management strata using 'quota sampling' (Babbie 2010:194; Gilbert 1993:75). Table 6.1 below provides a summary of respondents from study *kebeles*.

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Table 6.1 Distribution of study respondents across *kebeles* and land management strata

Name of study *kebele*	**Land management strata**	**Respondents that participated in FGDs**	**Respondents that participated in the in-depth interview**	**Total**
Debre Mawi	High	10	6	16
	Moderate	10	6	16
	Low	10	6	16
	Total	***30***	***18***	***48***
Densa Bahta	High	10	6	16
	Moderate	10	6	16
	Low	10	6	16
	Total	***30***	***18***	***48***

A total of 48 study respondents were selected per study site *(kebele)*, of whom 18 participated as respondents in individual interviews and 30 in FDGs (Table 6.1). By setting an equal quota for the three groups of land managers, 16 male farmers were drawn from each land management strata per *kebele*, of whom 10 participated in the FDGs and the remaining six were reached through individual interviews. The primary data gathered from study respondents is more valid, but less reliable for drawing tentative conclusions or theoretical generalizations about the research topic in the context of Amhara region. The reason was that this study applied qualitative field research to study 'subtle nuances in attitudes and behaviours and for examining social processes over time' in order to determine farmers' sustainable land-use practices (Babbie 2010:326). The chief strength of qualitative field research lies in the depth of understanding it permits. It also provides measures with greater validity than survey and experimental measurements, which are often criticized as being superficial and not valid. This study adopted proper design and procedures to gain 'real', 'rich' and 'deep' data from study respondents that ensured the validity of study results (see section 6.2). Field research, however, can pose problems of reliability. Reliability is a matter of dependability, and qualitative field research is generally not appropriate for arriving at statistical generalizations of the larger population. Indeed, the reliability of primary data gathering instruments was maximized by using measures that were less dependent on the subjectivity of researchers (by using structured instruments and combining open-ended items with close-ended items), simplifying the wordings of questions and translating instruments into the local language (Amarigna).

6.5 Data collection tools and techniques used in this study

The primary data needed to achieve the objectives of this study were collected through observation, FDGs, and individual interviews. These techniques were utilized not only to solicit primary data, but also for data triangulation. Triangulation is a method of using more than one research technique simultaneously in order to improve the quality of data (Daly 2000; Robson 1993; Sarantakos 1998). Secondary data sources such as satellite images, library materials, archives and documents of governmental organizations and NGOs supplemented the study. This section provides a brief discussion of methods of data collection adopted in this study.

6.5.1 Observation

The official letter about the research project that was issued by Bahir Dar University, which is the institution for which the lead researcher works, was initially submitted to Yilmana Densa *Woreda* Administration Office, Agriculture and Rural Development Office, and Environmental Protection and Land Administration desk. These authorities wrote official letters to the administrators of the case study *kebeles* and the agricultural extension and land administration workers assigned to the study areas. (See Diagram 5.3 for an organogram that shows the administrative structure and hierarchy of *woreda* and *kebeles*.) Following a formal communication with *woreda*- and *kebele*-level development workers and authorities, the researcher visited the selected *kebeles* on three occasions when local farmers were engaged in different field activities.

During the preparatory field visit (16–19 October 2012), extensive discussions were held with agricultural extension and land administration workers to find out, inter alia, about the general picture of the agrarian system, major problems, types of intervention, and areas of focus. During this period, the required basic statistics were extracted from the most recent unpublished documents, based on a checklist developed prior to the field visit. These statistics were used to characterize Yilmana Densa *woreda* and the study *kebeles*, and are presented in sections 4.3 and 4.4. The second field visit was conducted on 26–30 November 2012, a period in which farmers harvested most crops. This presented an opportunity to undertake a transect walk in the study *kebeles* with the help of four field assistants. The field assistants were nominated and assigned to the research project, based on consensus of the main stakeholders in the two case study *kebeles*. These were *kebele* cabinet members, agricultural extension workers and land administration experts. During the joint transect walk in the selected *kebeles,* proper notes were taken about the extent of land degradation and development intervention in the study areas. The third field visit was conducted on 17–25 January 2013, during which primary data were collected through FDGs and individual in-depth interviews. In this period, farmers were engaged in a public campaign and were mobilized by the local authorities to construct soil conservation measures in their own *kebeles*. Observation notes and audio-visual data were captured of all relevant aspects of the social process during the field visits, which were conducted in different seasons.

6.5.2 Focus group discussions

FDGs (FGDs) usually follow a non-standardized form of discussion and observation with research respondents. Sarantakos (1998:181) notes, ‘it is primarily a way of gaining information in a short period of time about the breadth or variation of opinions, and of establishing a mechanism of opinion formation’. According to Laws (2003:298), FGDs ‘can give people confidence to speak about their experiences in a way which may not occur in one-to-one interviews, especially, perhaps, when the subject or topic under discussion is in some way stigmatising’. Three FGDs were conducted per case study site in which study respondents were selected using a ‘quota sampling’ technique based on their land management practice (see section 6.4.2 above). The FGDs were undertaken in a homogeneous group to engender open and honest discussion, as well as to avoid problems of passive participation and associated ethical concerns. Individual and group reflections were enhanced by the FGD sessions through interactive methodology for facilitated conversations in this study. The group contained ten participants in order to manage and facilitate group discussion (Flick 2002). All FGD sessions, except one, were facilitated by the lead researcher, and provided a good opportunity for proper communication with study respondents, checking data accuracy and doing initial or ongoing data analyses that served as a basis to modify instruments in the research process. One assistant facilitator attended each session to take minutes or notes in order to enhance the validity of data. A semi-structured, open-ended topic guide, translated into Amharic was designed and used to facilitate the FGDs (see Annex I for topic guide). The topic guide was used to facilitate FGDs on topics of a more general nature rather than focus on household-level issues, and covered aspects such as land tenure system, soil degradation, sustainable land management and conservation.

Each FGD session passed through three phases: warm-up, introduction, and main discussion. The warm-ups were done by 'systematic coding' (Flick 2002:121)[105] with the aid of posters and photographs. Prior to the arrival of participants, posters and photographs that reflect issues of sustainable land management practices decorated the meeting rooms. The facilitators used these codes for brainstorming ideas during the warm-up phase. This was followed by an introductory phase in which the facilitators briefed the group about the objectives of the study and the ethical issues. Study respondents were allowed to introduce themselves by name, to explain the type of conservation structures, if any, on their farm plots, and to express their future intentions about conservation structures. The duration of the main discussions varied between 50 and 60 minutes. Note and minute taking and audio recording took place during the main discussion after the study respondents had expressed their unanimous willingness to allow these.

All FGDs were conducted in Amharic and audiotaped with the approval of the participants. The conversations were transcribed by the lead researcher, and crosschecked with minutes and notes by assistant facilitators. The transcriptions were used for theme and issue analysis and short quotes of the participants were translated into English and presented in major findings of the study. Retranslation of these quotes into Amharic was done to avoid the distortion of meaning that might have occurred in the original translation. In addition, all the main discussions of the FGD sessions were accurately audiotaped, transcribed and used to triangulate the data gathered by other techniques such as observation notes and in-depth

[105] Systematic coding is a technique of using visual materials such as posters and photographs in FGDs as an ice-breaking tool to warm up group members prior to going to the main discussions.

interview results. In addition, participants of the FGDs were grouped according to their land management practice to allow free expression of opinions and easier interpretation and analysis of results. A total of three FGDs were conducted per each case study site in which 30 men farmers were participated, and equal quotas were allocated to the three land management strata considered in the study (see Table 6.1 above).

6.5.3 Structured interview

The FGDs were supplemented by structured interviews for further exploration and data triangulation. The interviewees were selected through the quota sampling technique based on their land management practice (categorized as high, moderate, low), excluding those that participated in the FGDs. Eighteen respondents per *kebele* participated in in-depth interviews, and equal quotas were allocated to the three land management strata considered in the study (see Table 6.1 above). The quota sampling technique also considered the heterogeneousness of age and wealth of individuals to accommodate diverse opinions and explanations. Table 6.2 (below) shows the profile of interviewees based on selected socioeconomic characteristics.

Table 6.2 Distribution of individual interview participants by socioeconomic characteristics

Variables	Categories	Frequency	Percentage	Other statistics
Age (years)	Below 30	2	5.6	Mean = 43.89 Minimum = 25 Maximum = 71 Std deviation = 11.168
	31–40	15	41.7	
	41–59	7	19.4	
	60 and above	12	33.3	
Educational level	Illiterate	14	38.9	
	Read and write	8	22.2	
	Grades 1–4	6	16.7	
	Grades 5–8	6	16.7	
Land management	High	12	33.3	
	Moderate	12	33.3	
	Low	12	33.3	
Size of farmland owned (measured in *quada*[106]	Less than 4	13	37.1	Mean = 4.57 Minimum = 1.25 Maximum = 12 Std deviation = 2.66
	4.00 to 6.66	18	51.4	
	6.67 to 9.32	1	2.9	
	9.33 and above	3	8.6	
Family size (number of household members)	Less than 3	2	5.7	Mean = 6.6 Minimum = 2 Maximum = 11 Std deviation = 2
	3 to 5	6	17.1	
	6 to 7	21	60	
	8 and above	6	17.1	

[106] One hectare equals four quada.

The structured interview consisted of an interview guide with both open- and close-ended items that were translated into Amharic (see Annex II for the English version of the questionnaire). Three enumerators were deployed per study site (*kebele*) and each was assigned an equal number of respondents from each land management strata (that is, two from high, two from moderate and two from low land management strata). Recording devices were not used for the in-depth interviews because of early resistance from some farmers. The enumerators, who were specifically trained for the purpose of this study, were assigned to fill in the in-depth interview questionnaires.

The in-depth interviews were not only exploratory, but also explanatory in the sense that respondents provided their explanations for their actions directly. The term 'in-depth interview' is used in this study to distinguish it from the popular form of structured interview method designed to produce data appropriate to quantitative (statistical) analysis. The interview guide in Amharic helped to establish rapport between the interviewees and enumerators (Babbie 2010:317). Both the open- and close-ended items prepared for structured interviewees were therefore designed to obtain an in-depth understanding of the opportunities and constraints for sustainable farming practice in the case study villages. These relate to the set of five variables (driving forces, knowledge and attitude, productive asset holding, self-efficacy, risk perception and technology adoption) considered in the analytical framework used in this study.

6.5.5 Secondary data collection

In writing this case study, a range of secondary information sources, particularly evaluations, studies and annual reports of governmental and non-governmental organizations, published and unpublished, were consulted (see section 6.2). The researcher attended local workshops and seminars to update on theoretical and methodological developments.

6.6 Ethical issues

The entire process and procedures of the study were designed in due consideration of the ethical principles to which social research adheres. 'Ethics refers to rules of conduct; typically to conformity to a code or set of principles' (Reynolds, in Robson 1993:65). In simple terms, ethics refers to the general agreements and moral obligations shared by the scientific community (Babbie 2010:64). Accordingly, standard methodologies of qualitative research were applied for both primary and secondary data collection and processing. The standard ethical issues mentioned by Sarantakos (1998:23-25) under the themes 'professional practice and ethical standards', 'the researcher-respondent relationship' and 'the researcher-researcher relationship' were abided by in this research. For example, data triangulation was undertaken to ensure data quality and accuracy. Special care was taken to write an accurate and truthful research report with appropriate value-free interpretation of results, free from data fabrication and falsification. The researcher avoided plagiarism and personal bias in selecting and using the works of other researchers. Formal procedures were followed to secure permission from local government authorities and community leaders in order to conduct the study in the selected sites. The researcher did not give false impressions about himself and the research project to obtain permission. He also got the ethical clearance from the Higher Degree Committee of the Department of Development Studies (see Annex IV). In designing the data gathering instruments, ethical issues received the highest priority, and study respondents were informed of these at the outset.

The ethical issues that were addressed during the primary data collection process with research respondents included informed consent, privacy, anonymity and confidentiality (Babbie 2010:64-69). All participants of the FGDs and in-depth interviews were informed of the purpose of the research and participated freely. The research team avoided issues that might have caused embarrassment, guilt, discomfort, hazards or risks to the respondents. For instance, politically sensitive issues were deliberately avoided during the FGDs, but were discussed at individual level. Similarly, recording materials were used in the FGDs only after group members provided their unanimous willingness. All group discussants agreed to keep information and discussions confidential. No personal identification information of respondents/participants was kept in the notes, transcripts and the final research report. Likewise, individual interviewees were assured of anonymity and confidentiality of the information. No identification numbers were put on the interview questionnaires before they were submitted to the lead researcher. Apart from the assigned enumerators, no other person was allowed to hear the individual interviews. Moreover, the FGDs and individual interviews were undertaken at a venue and time determined by consensus of the respondents.

6.7 Limitation of the methodology

Though the selected research methodology and data gathering techniques were relevant and suitable to this particular study, the literature asserts some methodological limitations. Critics of the case study method believe that the study of a small number of cases cannot offer grounds for establishing the reliability and generalization of findings (Stake 2003). Sarantakos (1998) argues that for qualitative researchers, the notion of objectivity is fundamentally rejected. Chadwick et al (in Sarantakos 1998) note the generic limitations of qualitative research, for example 'problems of reliability caused by extreme subjectivity, problems of ethics and [naturally it is] time consuming' (in Sarantakos 1998:53). As Babbie (2010:327) notes, qualitative research is 'not an appropriate means for arriving at statistical descriptions of a large population'.

FGDs are expected to be problematic with documentation as it can be difficult to show the differentiation between statements of speakers (Flick 2002). Another expected limitation of the FGD is that not everyone may participate actively (Flick 2002). Open-ended question interviews are also charged with the problem of interviewer's bias in guiding the discussion and transcribing responses (Gilbert 1993:147-150). Therefore, the methodological limitations in relation to sampling bias and subjectivity hinder the chance of broad generalizations in time and space. However, the quota sampling method lends itself to the logic of representativeness, by reducing the sampling error, to do simple generalizations about the study population (Babbie 2010:194), given the risk of ecological fallacy considered in this case study. The personal values of the research team could not be completely eliminated in the interpretation of study results. However, these limitations were minimized in this study by utilizing ethically sound procedures, providing proper orientation and training to FGD facilitators and enumerators, stimulating individuals for active participation, and grouping them in a homogeneous group. The reliability of primary data-gathering instruments was maximized using measures that were less dependent on the subjectivity of researchers, simplifying the wording of questions and translating instruments into Amargna. Moreover, the simultaneous application of different sources of information improved data reliability and validity.

6.8 Strengths of the methodology

The overall benefit of the methodology is its suitability for exploring reality from inside rather than outside by examining the local farmers' knowledge, attitude and practices regarding land tenure security and sustainable use of farmlands in the study area (Sarantakos 1998). 'A case study is both the process of learning about the case and the product of our learning' (Stake 2003:87). Thus, the methodology fits with the underlying principles and objectives of the study as spelled out in chapter 1.

Qualitative research makes the study a data enhancer that could help to see key aspects of the case more clearly (Sarantakos 1998). More comprehensive strengths of qualitative research include 'humanizing the research process ... presenting a more realistic view of the world, allowing more flexibility' (Chadwick et al in Sarantakos 1998:53; Babbie 2010:326). Qualitative research describes reality as it is – ideographic – as well as employing an inductive approach (Sarantakos 1998), which is appropriate for the purpose of this particular study. In addition, as Flick (2002) mentions, the FGD method helps consensus formulation that arises from interaction processes of group dynamics. The technique of adopting FGDs with a homogeneous group helps to ensure free expression of opinions towards the research topic. FGD helps to capture real life data that has high face validity (Krueger 1988:47 quoted in Babbie 2010:323). Moreover, the application of the in-depth interview technique helps to investigate the variables regarded as highly sensitive at a group level. In order to overcome the interviewer's bias, structured topic guides were developed, proper orientation was provided, and results were compared with outputs from other techniques (Gilbert 1993).

This research adopted multiple tools and techniques in order to minimize the problems associated with data validity and reliability. The researcher has practical experience in data-gathering techniques and ethical issues to minimize the anticipated methodological limitations in this study. In addition, the research process and techniques are methodologically sound to serve as empirical examples for interested social researchers in the subject matter. They lay the foundation to expand on the analytical framework that is applied in this study to more cases and groups to challenge the neo-liberal development theory and the hegemony of positivist epistemology. The researcher's discomfort with the positivist paradigm is that, to a large extent, it tends to close out other ways of thinking and alternative worldviews, thereby limiting innovative ways of dealing with the problems of land degradation in the developing world. There is thus a need to develop alternative ways of knowing as they may provide clues to addressing the social, economic and environmental dimensions of sustainable development. Besides, it is simplistic for positivists to assume that the social and physical worlds are similar so that one can investigate phenomena in these worlds using the same methodology (Mouton 1996). In the researcher's view, the positivist paradigm may be more applicable in the physical world, where scientists can explore molecules and atoms objectively. However, in the social environment, reality is socially constructed, based on one's experiences in life and one's worldviews, which vary in time and space, thus making prediction of human behaviour problematic (Briggs 2005).

6.9 Method of data analysis

Data analysis relied mainly on qualitative techniques, and was conducted on an 'on-going' and 'terminal' basis (Creswell 2009). In most cases, initial or ongoing data analyses were made jointly with the respondents in the field to eliminate personal biases in interpretation. The initial data analysis process thus aimed at ensuring proper communication with study respondents, checking data accuracy and serving as a basis to modify instruments in the research process. The final or terminal data analysis was done after completion of data gathering from both primary and secondary sources. Data gathered from all sources were triangulated and analysed in-depth in relation to the set objectives, research questions and thematic categories of the research. Thematic coding techniques were used to summarize and analyse themes and constructs related to the study. By combining field notes, captured audiovisual scenes, transcription of FGDs and filled in-depth interview questionnaires, the final or terminal data analysis was able to establish connections and consistencies that provided greater understanding of issues. In this endeavour, the following tasks or techniques were adopted:

- Raw data were stored in the forms of transcription notes (exact statements) for qualitative data and software-compatible variable facts and figures for quantitative data were categorized or classified under six themes (perception of land tenure security, perception of sustainable land use, knowledge and attitude of farmers to conservation technologies, perception of the impact of land registration and certification on sustainable use of farmlands, observed patterns of change towards sustainable farming in the pre and post land certification periods, and factors that affect the sustainable use of farmlands).

- Descriptive statistics and statements were generated to provide summaries, brief descriptions, illustrations, and typical and/or illuminating quotes, especially showing diversity.
- Synthesis took place through filtering preconceptions, expectations, and personal opinions and separating biases and stereotypes.
- Cross-checking and validating was done prior to the generalization of findings.
- Consistencies and inconsistencies were analysed with a view to maximizing the understanding of results. In analysing the data, attention was paid to two issues: first, establishing broad areas of consensus and differences among focus group discussants and in-depth interviewees on thematic topics; and, second, drawing attention to areas of difference across the two case study sites and three groups of farmers.

The research adopted suitable analysis methods for both qualitative and quantitative data. Qualitative data were processed using 'coding' for 'discovering patterns' (see Babbie 2010:394-404) while quantitative data were analysed using appropriate statistical methods to interpret the extent, nature and pattern of relationship among variables of interest. In processing quantitative data, simple statistical tools, such as percentage, average, and cross-tabulation techniques were employed using the software package for social science research (SPSS version 16.0). The final output of data analysis appears in chapter 7. The chapter begins by providing a short introduction followed by theme or issue analysis about the social processes and patterns discovered to address the relevant specific research questions or secondary objectives set by the thesis.

6.10 Conclusion

The chapter provided the overall research design and the rationale of opting for a qualitative research methodology. The chapter also indicated that how the shortcomings of the positivist/post positivist paradigm gave rise to other ways of generating knowledge of which the prominent ones are the interpretivism, social constructionism and critical/standpoint paradigms. In addition, the chapter indicated that the research methodology adopted in this thesis is informed by interpretivism paradigm. The research methodology applied has its own limitations and strengths in light of the research paradigm debate discussed in section 6.3. However, the researcher believes that it is flexible in its nature to meet the objectives of the study. The researcher opted for qualitative research methodology in which a case study design was used that helped to use a range of data collection methods. This rendered the research the application of appropriate tools for the information it required. The chapter elaborated the purposive sampling procedure followed to select both the case study sites and study respondents. Moreover, the chapter elaborated on the methods of data collection and analysis as well as a number of ethical issues addressed in the research. The limitations and strengths of the selected methodologies and some of the biases of the research in general were also outlined in the chapter. The next chapter deals with the presentation of results and data analysis.

CHAPTER SEVEN: PRESENTATION OF RESULTS AND DATA ANALYSIS

7.1 Introduction

The purpose of this chapter is to present the results obtained from primary research and the analysis of the findings in light of the research problem and objectives. The main thrust of this chapter is to:

1. Examine the views, knowledge, and attitude of farmers to the impact of land certification and registration on the ecologically sustainable use of farmlands in the case study sites
2. Investigate variables and factors that affect the sustainable use of farmlands in the Amhara region by using a generic analytical framework

The following six themes were generated in order to organize and present the findings and discussion in line with the objectives set above:

- Perception of land tenure security
- Perception of sustainable land use
- Knowledge and attitude of farmers to conservation technologies
- Perception of the impact of land registration and certification on sustainable use of farmlands
- Observed patterns of change towards sustainable farming in the pre and post land certification periods
- Factors that affect the sustainable use of farmlands

The primary data gathered from study respondents, who comprised 60 FGD participants and 36 in-depth interview participants (see sections 6.5.2 and 6.5.3), was processed, and the results appear under these six themes. Observation notes and photographs captured in the field, along with information gathered through document review, are also presented in line with these themes. To distinguish between the sets of respondents, the term ‘group discussants’ refers to FGD participants, the term ‘interviewees’ refers to in-depth interview participants, and the term ‘study respondents’ refers to both group discussants and interviewees of the study.

In addition, study respondents (both group discussants and interviewees) were categorized into three land management practices, based on their performance in the last five of years (see section 6.4.2). High performers are those respondents who undertook the construction and maintenance of various types of terraces on their holdings. Moderate performers are those respondents who constructed, but did not maintain various types of terraces on their holdings. Low performers are those respondents who had neither constructed nor maintained any type of terrace on their holdings in the last five years. In view of this, the high performers are those farmers that follow sustainable land management practice, whereas low performers are those farmers that follow unsustainable farming practice. The moderate performers are those farmers that have an intermediate position towards sustainable land management practice (see section 6.4.2).

The rest of the chapter is organized in the following manner. Section 7.2 presents the major findings in relation to study respondents' perceptions of land tenure security and the effect of land registration and certification on farm households' perceptions of land tenure security. The third section provides empirical evidence on the perceptions of study respondents regarding sustainable land use and the prevailing environmental degradation in the study *kebeles*. The fourth section is devoted to analysing the knowledge and attitude of farmers about conservation technologies. Section 5 presents study respondents' perceptions of the impact of land registration and certification on the sustainable use of farmlands. Section 6 analyses and documents the pattern(s) of farming practices towards sustainable land use during the pre and post certification periods in the study *kebeles*. Section 7 shows the dynamic synergy of factors that affect the sustainable use of farmlands in Amhara region in terms of the SLF and the farming system model. The last section provides a short conclusion to the chapter.

7.2 Perception of land tenure security

Land is one of the major productive assets that determine the social and economic position of households in rural Ethiopia (see section 4.2). Smallholder farmers acquire access to land in several ways, including sharecropping, inheritance and distribution or reallocation of *kebele* administration within a land tenure system characterized by state ownership (see also sections 1.4 and 1.5). Since the state (public) land tenure system, which is characterized by frequent land redistribution, is considered a major cause of land tenure insecurity among smallholders in Ethiopia, the study measured land tenure security based on farmers' perceptions of their security of tenure. Land tenure security is operationally defined in terms of study respondents' perceptions of their certainty of land possession and assurance of long duration accorded by land certificate for the adoption of conservation investment and sustainable use of farmlands. Measuring study respondents perceptions of land tenure security passed through several stages in the research process. Study respondents were asked open-ended questions in FDGs along with close-ended questions raised in the in-depth interviews (see Annex I and II). Finally, a composite index was generated to measure the effects of land certification on study respondents' perceptions of land tenure security and to examine its effect on farm households' land management practice. These procedures clearly indicate the contributions of the study in contrast to the theoretical and empirical literature discussed in sections 2.3.1 and 2.3.2. Often a dummy variable is used in the literature to measure either the 'content' or the 'assurance' aspects of land tenure security. Nonetheless, alternative measures were adopted in this thesis to examine study respondents perceptions of tenure security, and to arrive at a composite index that summarizes both the 'content' and 'assurance' aspects of land tenure security (see section 2.3.1).

Participants of the FGDs were asked about the differences and similarities of the current land tenure system with that of the Derg regime (see Annex I, question 1).[107] The results across the two *kebeles* were remarkably similar, with a few differences that surfaced across the three groups of farmers. No group discussant mentioned any similarity between the two regimes, and surprisingly no one mentioned that land is owned by the state in both regimes. This contradicts to the widely held view of scholars (eg Adal 2002; EEA 2002; Rahmato 2009), which contends that the current land-use policy is similar to its predecessor in perpetuating land tenure insecurity among the farming community, since land is still owned by the state in contemporary Ethiopia. This result may simply shows that the issue of land ownership is divorced from the perception of security of land tenure among group discussants.

[107] As mentioned in section 1.4, the 1975 land reform of the Derg regime abolished all customary rights to land and vested in the state the power to redefine rights of property and access to land. It dispossessed the landed classes and distributed land to peasants who were organized in peasant associations and who were entitled to land as residents of their *kebeles*. The basic provisions of the Derg reform were state ownership of all rural lands; prohibitions on transfer of use rights by sale, exchange, succession, mortgage or lease. Land transfers could only be possible through periodic redistribution undertaken by *kebele* administrators. Similarly, the current regime defined land as the property of the people, but administered on their behalf by the state. Land cannot be sold, exchanged or mortgaged, but the present policy does allow short-term leasing or sharecropping, as well as the hiring of labour, both of which were illegal under the Derg regime.

Group discussants distinguishing the differences between the current land tenure system and that of the Derg regime showed some variations across the land management strata. These could be summarized by the following two representative quotes:

> There has been annual [periodic] redistribution of land during the Derg period, whereas we have a secure user right over our holding in the current regime, which is assured by the green land certificate provided to us.

The above quotation represents the views of discussants from high and moderate land management strata in both *kebeles*. In simple terms, this representative quotation reflects the opinion of two thirds of group discussants participated in the study. In contrast, the following quotation represents the views of discussants from the low land management stratum in both *kebeles*.

> There has been egalitarian periodic land redistribution based on family size during the Derg period, whereas the issue of equity is overlooked during the issuance of land certificate in the current era.

This representative quotation reflects the opinion of one third of the group discussants who participated in the study. The view indicated that the current land registration and certification scheme has failed to address the inequality in possession of farmlands. The exceptional reflection of this opinion among group discussants drawn from low land management stratum in both *kebeles* implies that inequality in possession of farmlands could have an adverse effect on adoption of conservation technologies, hence unsustainable use of farmlands. A case in point is that group discussants drawn from the low land management stratum in both *kebeles* highlighted the issue of land shortage as a major impediment to the adoption of conservation technologies. Surprisingly, group discussants mentioned this issue when they were asked to distinguish between the current land tenure system and that of the Derg at the beginning of the FGD sessions (see Annex I, Question 1). Though responses seemed irrelevant to the question, representative quotations regarding to the issue of land shortage as a major impediment to the adoption of conservation technologies were, for example, that 'lack of farmland is the most serious agricultural problem as some individuals in large families cannot have a piece of land for farming, let alone covering it by bunds' (FGD participant in Debre Mawi *kebele*); and that 'shortage of farmland is a major impediment to adoption of terraces, since terrace construction competes for the small plot I own' (FGD participant in Densa Bahta *kebele*). These comments, which emerged at the outset of FGD sessions among discussants from the low land management stratum in both *kebeles* show the important role of size of farmland possessed on adoption of conservation technologies. Obviously, inequitable distribution of land among the farming community might have adverse implications for equity and efficiency aspects of resource use.

Group discussants support the view that continued access to and use of land for farming was important to most study respondents' perceptions of their security of tenure, given the Ethiopian context, in which land is owned by the state. In addition, the issue of land shortage and inequitable land distribution was echoed by a third of discussants from low land management stratum in both *kebeles*. The findings that resulted from the FGDs were in line with interviewees' perception of land tenure security measured through alternative close-ended questions. The study used a four-item binary scale in the in-depth interviews to obtain a rough indication of the importance of use and transfer rights to interviewees' perception of their security of land tenure (see Annex II, question 8). The results obtained from in-depth interview respondents are presented in Table 7.1.

Table 7.1 Perception of security of land tenure among individual interviewees

Statements	**Percentage of responses in Debre Mawi *kebele***		**Percentage of responses in Densa Bahta *kebele***		**Percentage of Responses in both *kebeles***	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**
1. Is land tenure security having a right to continually cultivate the land without outside interference?	88.9	11.1	100	0	94.3	5.7
2. Is land tenure security having a right to reap benefits of capital and labour invested in land?	94.1	5.9	94.1	5.9	94.1	5.9
3. Is land tenure security having a right to benefit from the land temporarily transferred to others?	47.1	52.9	29.4	70.6	38.2	61.8
4. Is land tenure security having a right to benefit from the land permanently transferred to others?	29.4	70.6	17.6	82.4	23.5	76.5

Source: Field survey (2013)

The first two statements in Table 7.1 above were designed to trace the inclination of study respondents towards use rights,[108] whereas the last two statements were meant to trace their

[108] Property rights in land could be broadly disaggregated into use rights and transfer rights. 'Use rights' refers to the rights to grow crops, perennials, and to modify the land. 'Transfer rights' refers to the rights to sell, rent, gift, mortgage, pledge or bequeath (see section 1.2).

inclination towards transfer rights. The results of Table 7.1 show that the majority of interviewees associate their perceptions of security of land tenure with use rights. Approximately 94 per cent of interviewees drawn from both *kebeles* virtually affirmed that their perceptions of security of land tenure was associated with their access to and use of land for farming (see the first and second statements in Table 7.1 above). The results were reversed for statements associated with transfer rights. Approximately 38 per cent of interviewees indicated that their perception of security of land tenure was associated with temporary transfer rights (see the third statement in Table 7.1 above). Less than a quarter of interviewees associated their perception of security of land tenure with permanent transfer rights (see the 4th statement in Table 7.1 above).

In addition, the majority of interviewees reflected favourable opinions on the current land tenure system. Interviewees were asked whether the current land tenure system is good for them (see Annex II, question 14). The majority of interviewees (75%) think that the current land tenure system is favourable to them, while 25% believe that the system is unfavourable to them. This shows that those interviewees that support state/public ownership of land seem to reflect the majority opinion of farmers who participated in this study. Moreover, interviewees were asked to rank the reasons that substantiate their satisfaction and dissatisfaction with the current land tenure system (see Annex II, question 15 and 16). Table 7.2 below presents the first three rankings given to the reasons that substantiate interviewees' satisfaction and dissatisfaction across the two *kebeles*.

Table 7.2 Interviewees' opinion on current land tenure system and the first three rankings to the reasons that substantiate their opinion

Opinion on current land tenure system	**Reasons**	**Ranked First**		**Ranked second**		**Ranked Third**	
		% of respondents **in Debre Mawi**	**% of respondents in Densa Bahta**	**% of respondents in Debre Mawi**	**% of** respondents **in Densa Bahta**	**% of** respondents **in Debre Mawi**	**% of** respondents **in Densa Bahta**
Good for me	You can acquire land easily	14.3	15.4	9.1	15.4	40.0	62.5
	More secure than before	42.9	38.5	54.5	38.5	-	-
	Have no problem of border conflict	35.7	38.5	27.3	23.1	40.0	25.0
	Fair distribution of land	7.1	7.7	9.1	23.1	20.0	12.5
Not Good for me	Problem with local officials & administrators	50.0	20.0	-	-	-	25.0
	Injustice in land distribution	25.0	-	25.0	20.0	-	50.0
	Not being able to get additional land	25.0	20.0	25.0	20.0	25.0	-
	Could not solve land shortage	-	60.0	25.0	20.0	50.0	-
	Not being able to sell and buy land	-	-	25.0	-	25.0	-
	Fear of losing land, tenure insecurity	-	-	-	40.0	-	25.0

Source: Field survey (2013)

From Table 7.2 above one can observe that the reasons suggested in favour of the current land tenure system are more or less similar across the two *kebeles*. The dominant reason suggested by those interviewees who think that the current land tenure system is favourable to them is the certainty of possession accorded by the current land tenure system. The majority of interviewees in both *kebeles* ranked first and second a justification that expresses their tenure is now more secure than before. This is followed by a justification suggested in relation to reduced border conflict under the current land tenure system. This finding reveals that security of possession of land and non-interference by the state and private entities is relatively better in the current land tenure system. In contrast, the reasons suggested against the current land tenure system vary across *kebeles*. This shows that the reason for the current land tenure system not being favourable for interviewees depends on the context of each *kebele*. For example, 50 per cent of interviewees who expressed their dissatisfaction with the current land tenure system ranked first their problem with local authorities in Debre Mawi *kebele,* whereas 60 per cent of interviewees who expressed their dissatisfaction with the current land tenure system justified their position (ranked first) by mentioning the paucity of the current land tenure system in solving the land shortage in Densa Bahta *kebele*. The average size of farmland possessed per household in Debre Mawi and Densa Bahta was approximately 1.3 and 1 hectares, respectively (see sections 5.4.1 and 5.4.2). Indeed, interviewees opposing the prevailing land policy give their inability to obtain additional land as a common reason for their dissatisfaction across the two *kebeles*. In view of this, we looked at the aggregated statistics to gain the knowledge of critical elements and factors that influence local farmers' dissatisfaction with current land tenure system. Incapability of current land tenure system to solve the prevailing land shortage was suggested as a dominant reason, which was ranked first by 33.3 per cent of interviewees who expressed their dissatisfaction with the current land tenure system. In addition, injustice in land distribution, inability to obtain additional land and incapability of the tenure system to solve the prevailing land shortage are ranked second by equal proportion (22.2 per cent) of interviewees who expressed their dissatisfaction with the current land tenure system. The overall picture shows that farmers' dissatisfaction with the current land tenure system arises from their problem with local officials and administrators, injustice in land distribution, inability to obtain additional land and incapability of the tenure system to solve the prevailing land shortage (see Diagram 7.1 below).

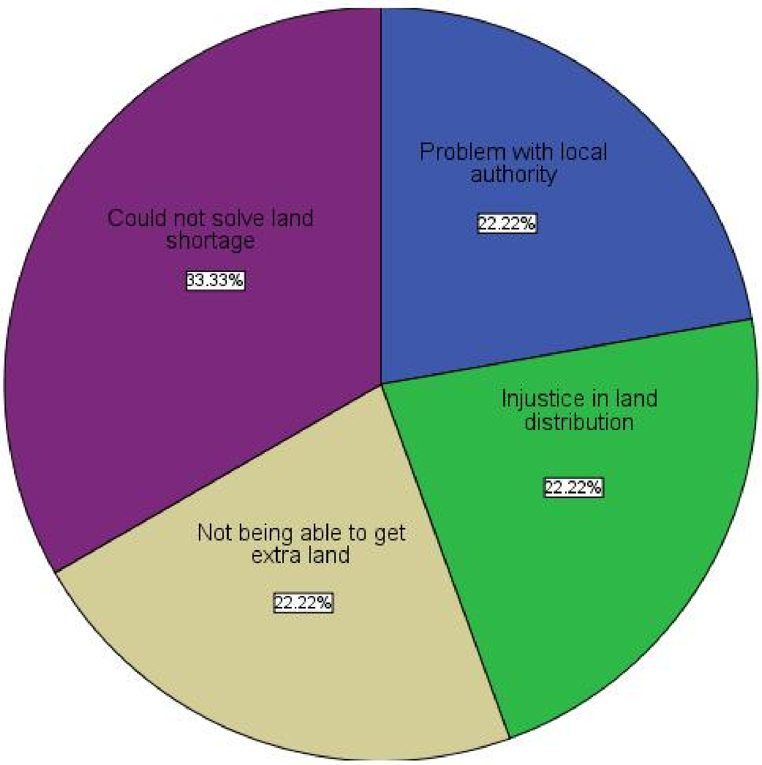

Diagram 7.1 Interviewees' reasons for their dissatisfaction with the current land tenure system

In order to measure farmers' attitudes towards land registration and certification scheme in a more general way, the research considered six set of items with regard to the anticipated effects of land titling on social equity, individual assurance, reasonable compensation, conflict resolution, gender equity and efficient land market transactions (see Annex II, question 9). The first, second, third, fourth, fifth and sixth statements in Table 7.3 correspond to the effects that land titling has on social equity, individual assurance, reasonable compensation, conflict resolution, gender equity and efficient land market transactions, respectively. A composite index was thus developed to measure the study respondents' perceptions of security of land tenure using a five-point Likert scale comprising six statements. The maximum and minimum score was set as 30 and 6, respectively. This is further grouped into favourable, neutral and unfavourable attitudinal scores to develop a grouped frequency table. The favourable score ranges between 24 and 30, the neutral score ranges 13 and 23, and the unfavourable score ranges 6 and 12. The results obtained from interviewees are shown in subsequent tables.

Table 7.3 Perception of interviewees on the current land policy

Statement	**Strongly Agree (%)**	**Agree (%)**	**No opinion (%)**	**Disagree (%)**	**Strongly Disagree (%)**
1. Land certification guarantees secure equal and enforceable land rights to both rich and poor farmers	68.6	17.1	5.7	8.6	0
2. I am certain that the user rights given to me on arable lands will remain with me and my family for the coming five years	48.6	42.9	0	8.6	0
3. Adequate compensations will be given for the visible investments I made in my holdings if there is future land redistribution	48.6	40.0	5.7	5.7	0
4. Land certification ameliorated conflicts over access to land among relatives and neighbours	51.4	34.3	2.9	11.4	0
5. Land certification guarantees secure, equal and enforceable land rights to both men and women farmers	65.7	25.7	0	8.6	0
6. Land certification guarantees secure and enforceable formal land market transactions	42.9	34.3	2.9	20.0	0

Source: Field survey (2013)

Table 7.4 Grouped frequency results of attitude scores across study *kebeles*

Attitude score	**Score Interval**	***Kebele***				**Total**	
		Debre Mawi		**Densa Bahta**			
		N	**%**	**N**	**%**	**N**	**%**
Unfavourable	6-12	0	0	0	0	0	0
Neutral	13-23	1	5.6	0	0	1	2.9
Favourable	24-30	17	94.4	17	100	34	97.1
Total		18	100	17	100	35	100

Source: Field survey (2013)

From the results of Tables 7.3 and 7.4 above, one can observe that nearly all interviewees have a favourable attitude towards land certification and registration scheme. This shows that land registration and certification has contributed to a high perception of security of land tenure since 97 per cent of the interviewees drawn from the two *kebeles* have a favourable attitude score. In addition, this positive impact of land registration and certification scheme was found to be uniform across the three groups of farmers that follow different farming practices. Table 7.5 provides a grouped frequency result of attitude score across interviewees drawn from the three land management strata.

Table 7.5 Grouped frequency results of attitude scores across the three land management strata

Attitude score	**Score Interval**	**Land Management Strata**						**Total**	
		High		**Moderate**		**Low**			
		N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Unfavourable	6-12	-	-	-	-	-	-	-	-
Neutral	13-23	-	-	-	-	1	9.1	1	2.9
Favourable	24-30	12	100	12	100	10	90.9	34	97.1
Total		12	100	12	100	11	100	35	100

Source: Field survey (2013)

From Tables 7.4 and 7.5 above, one can deduce that the perception of land tenure security is high across the three land management strata and the two case study *kebeles* since the attitude scores lie within a favourable range in both cases. However, it seems that farmers with lower per-capita land holding tend to dislike the current land tenure system since inability to obtain additional land, injustice in land distribution and paucity of the land tenure system to solve land shortage are common reasons cited by 25% of interviewees who expressed their dissatisfaction with the current land tenure system (see Table 7.2 and Diagram 7.1 above). It should also be noted that out of 13 interviewees who expressed their dissatisfaction with the current land tenure system, eight were drawn from the low land management stratum. In addition, group discussants drawn from this stratum unanimously contended that egalitarian land redistribution was overlooked during the issuance of the land certificate (see the second quotation on page 217). Moreover, the average size of registered and certified farmland among interviewees from high, moderate and low land management strata was 1.2; 1; and 0.75 hectares, respectively. As indicated in section 5.4, the average size of farmland possessed per household in Debre Mawi and Densa Bahta was approximately 1.3 and 1 hectares, respectively. In view of this, the average farmland possessed by interviewees from the low land management stratum is still below the average size of farmland possessed per household in the case study *kebeles*. These findings suggest the impact of the size of farmland possessed by farm households in mediating sustainable use of farmlands, given the observed high perception of security of tenure across the three land management strata in both *kebeles*.

Box 7.1 Summary of major results on perception of security of tenure

Result 1: No group discussant mentioned any similarity between the Derg and the current land tenure systems, and no one mentioned that land was owned by the state in both regimes.
Result 2: The majority of interviewees (75%) and group discussants (2/3) affirmed that they have a secure use rights over their holdings under the current land tenure system.
Result 3: The issue of land shortage and inequitable land distribution was echoed by a third of group discussants from the low land management stratum and by 25 per cent of interviewees, who expressed their dissatisfaction with the current land tenure system.
Result 4: The majority of interviewees (94 %) affirmed that their perception of security of land tenure was associated with their access to and use of land for farming.
Result 5: The perception of land tenure security was high across the two *kebeles* and the three land management strata since the attitude score of interviewees lies within a favourable range in both cases.
Result 6: Group discussants drawn from low land management stratum in both *Kebeles* highlighted the issue of land shortage as a major impediment to adoption of conservation technologies.
Result 7: The average size of registered and certified farmland among interviewees drawn from high, moderate and low land management strata was found as 1.2; 1 and 0.75 hectares, respectively

The first five results indicated in box 7.1 above imply that user rights are more important than transfer rights to the perception of land tenure security among a significant number of study respondents. The major critics of the current land tenure system, which features state ownership of all rural lands, cite the legal prohibition of land selling and mortgaging (see sections 1.3, 1.4 and 1.5). In theory, transfer rights that arise from land selling and mortgaging have an important implication for both the perception of land tenure security and efficient allocation of productive resources (see sections 1.2 and 2.3.2). In contrast, the findings provide evidence that the absence of land selling and mortgaging may not be a source of land tenure insecurity in the study *kebeles,* but of inefficient allocation of land and labour resources (see results 1, 2, 3, 4, 5, 6 and 7 above). Result 2, 4 and 5 indicate that a significant majority of study respondents have high perceptions of security of tenure under the current land tenure system. From results 3, 6 and 7 above, it is possible to deduce the adverse effects of the prevailing inequitable land distribution on equity and efficiency aspects of the use of productive resources, as well as on sustainable use of farmlands.

Farm households expressed their dissatisfaction with the land registration and certification scheme because of their inability to obtain additional land, since egalitarian land redistribution is banned. Amhara regional state has publicly dissociated itself from possible future land redistribution in its most recent rural land law (see section 1.5 for a brief discussion of rural land laws in Amhara region). Revised Rural Land Administration and Use Proclamation Number 133/2006 states that land redistribution and allotment will not be carried out unless a minimum of 80% of the landholders in one village request the authority for land re-distribution and its application will only be on holders that supported the decision (ANRS 2006, Article 8). This shows that the existing socio-political environment does not allow considering the size of land holding to a few disadvantaged households in the 1997 land redistribution. The 1997 land redistribution, which was based on Proclamation Number 16/1996, is criticized extensively in the literature for the 'politicization' of its implementation process. The application of the policy was limited to those areas of Amhara region that were not under the control of the Ethiopian People Revolutionary and Democratic Front (EPRDF) before the fall of the Derg in 1991.[109] This top-down policy intervention categorized smallholders along 'class' lines, labelling some bureaucrats and remnants of feudal farmers

[109] EPRDF is the current ruling party that took power since 1991. The party came into power by overthrowing the Derg regime after 17 years' civil war. During the civil war, EPRDF was held some parts of North Gondar and North Wello as its free land occupations for approximately 15 years. Thus, the 1997 land redistribution was not applied to those areas of the Amhara region that were under the control of EPRDF.

vis-à-vis poor peasants. Household heads classified as 'remaining feudal' or 'former bureaucrat' were allowed to keep only one hectare of land, while other farmers could keep up to three hectares (Adal 2002; Gebreselassie 2006; Jemma 2001). In 2007, provisional land certificates were provided to smallholders in the study *kebeles* based on the size of farmland allocated to them in the 1997 land redistribution.

From results 2 and 5 above, one can deduce that land registration and certification have contributed to a high perception of security of land tenure across the *kebeles* and land management strata. However, a high perception of land tenure security across the three land management strata implies that a perception of tenure security alone does not guarantee sustainable farming practice. This hints at the presence of other important variables, apart from farmers' perceptions of security of land tenure, that mediate sustainable land management practices in the study areas. Results 3, 6 and 7 provide initial evidence that shows that local farmers' land management practice is greatly affected by the size of land possessed by farm households. Result 3 reveals that the issue of land shortage and inequitable land distribution was equally echoed in both *kebeles* by discussants from the low land management stratum. In addition, group discussants drawn from the low land management stratum in both *kebeles* highlighted the issue of land shortage as a major impediment to adoption of conservation technologies (see result 6 above). Likewise, the average size of registered and certified farmland among interviewees drawn from high, moderate and the low land management strata was found to be approximately 1.2, 1 and 0.75 hectares, respectively (see result 7 above). The average size of farmland possessed by interviewees from the low land management stratum (0.75 ha) is lower than the village average of both Debre Mawi (1.3 ha) and Densa Bahta (1 ha) *kebeles*. Moreover, interviewees who expressed their dissatisfaction with the current land tenure system substantiated their position by mentioning their problem with local authorities, injustice in land distribution, their inability to obtain additional land and paucity of the tenure system to solve the prevailing land shortage commonly across the two *kebeles* (see Diagram 7.1 above). Out of 25% of interviewees who expressed their dissatisfaction with the current land tenure system the majority of them were drawn from low land management stratum. The overall implication of results 3, 6 and 7 above is that the size of farmland possessed by farm households has an important role in mediating sustainable use of farmlands, given the observed high perception of security of tenure in the study *kebeles*.

Therefore, land certification and registration constitutes the necessary but not the sufficient conditions for sustainable use of farmlands in the case study *kebeles*. In the subsequent sections of the chapter, attempts will be made to show the positive and negative impacts of land registration and certification scheme towards sustainable use of farmlands. On the positive side, the scheme contributed to a high perception of security of land tenure among farm households that could lead to improved adoption and sustained use of conservation technologies by local farmers, thereby sustainable use of farmlands. On the negative side, the scheme failed to address existing inequality in possession of farmlands that could have an adverse effect on adoption of conservation technologies, thereby unsustainable use of farmlands. Inequitable distribution of land among the farming community might also have an adverse implication for both equity and efficiency aspects of resource use.

7.3 Perception of sustainable land use

This particular study defines sustainable use of farmlands in terms of 'ecological sustainability' and 'socioeconomic sustainability' as an operational definition (see the second last paragraph of section 2.3.2 in this thesis). Ecological sustainability implies that farmlands are used in a manner of maintaining production (output) levels for current and future generations. Since farmlands are regarded as renewable natural capital, their utilization should equal the regenerative rates to satisfy the conditions of ecological sustainability. The proxy indicator of ecological sustainability is the pattern of crop yield obtained from a particular farmland over years. The socioeconomic sustainability implies that ecological sustainability of farmlands could continue by smallholders given their agro-ecological and socioeconomic diversity. The proxy indicator to socioeconomic sustainability is the pattern of adoption or rejection of conservation technologies over years in each of the case study sites (rural *kebeles*).

Group discussants were asked whether they would recognize a sustainable versus unsustainable farmland from its appearance (see Annex I, question 4). The responses across the two *kebeles* and the three land management strata do not show significant differences. A typical answer is represented by the following quotations:

> We all easily identify a sustainable farmland that provides promising crop yield year to year by looking the colour of its soil and absence of rills on its surface.
>
> Sustainable farmland requires less fertilizer to obtain a good harvest while unsustainable farmland demands more fertilizer from year to year.

> Thick soil cover characterizes sustainable farmland while poor farms have thin soil cover.

Focus group participants were also asked, 'Do you think that there is soil degradation in the arable lands of your locality? If yes, what are the major causes and manifestations?' (See Annex I, question 3.)

The responses across *kebeles* and land management strata were unanimous, which affirms the presence of soil degradation in their locality. Typical views of farmers' perceptions of the existence of soil degradation in their locality are shown by these representative statements:

> Our grandfathers used to cultivate small farmlands and got good yields. Today, larger farmlands if cultivated are met with poor yields.
>
> We are using of a large quantity of chemical fertilizer due to the degradation of farmlands. The price of fertilizer is rising year to year … The quantity of fertilizer applied on my holdings also progressed year to year.

The above observation supports the view that local farmers are well aware of the existence of soil degradation on farmlands, and the presence of unsustainable land management practices in the study *kebeles*. Based on the quotations above, local farmers implicitly defined sustainable farmland as land that provides promising crop yield year after year, and is characterized by thick soil cover that demands the application of less quantity of chemical fertilizer. They also described the existing land degradation of their locality in terms of reduced crop yield obtained from a given farmland, as well as progressive use of chemical fertilizer to obtain a good harvest from ecologically unsustainable farmland. This shows that local farmers' views of sustainable farmland presuppose the concept of ecological sustainability considered in this study.

FGD participants' insights into the causes of land degradation are summarized in these statements:

- Water erosion is the cause of farmland degradation in our community.
- The major reason that exposes farmlands to soil erosion is lack of diversion ditches.
- The steepness[110] of the slope is the cause of water erosion.

[110] Though the two case study *Kebeles* differ in their topography, steepness or slope of the land as a major cause of soil erosion is mentioned unanimously among focus group discussants from both *Kebeles*.

- Poor land management is the cause of farmland degradation in our community.

FGD participants' perceptions of the manifestations of soil erosion in their locality are summarized thus:

- Small and large rills are seen in the field after the rainy period.
- Decline in soil fertility arises because of continuous cultivation.
- Landscape changes from plane surface towards fragmented surface characterized by several gorges and gullies.

The views of FGD participants on the possible causes of farmland degradation are indicative of their ability to diagnose the anthropogenic causes of land degradation and perceived lack of power to control problems of soil erosion in their communities. They stated that poor land management is the cause of farmland degradation in their locality. At the same time, they indicated that steepness of the land and an apparent lack of diversion ditches as the causes of soil erosion prevail in their locality. As indicated above, FGD participants cited a decline in soil fertility as a manifestation of soil erosion. They contend that there is a decline on soil fertility because of continuous cultivation of crops. This simply shows that their focus is not on soil erosion per se, but on soil fertility. Indeed, they assert that the presence of small and large rills, gorges and gullies as the manifestations to the presence of soil erosion in their locality.

The study used a five-point Likert scale containing four items to measure the attitudes of interviewees on issues associated with the concept of ecological sustainability (see Annex II, question 39). The opinion of farmers shows no variation across *kebeles* and land management strata, except for one item. Table 7.6 presents a summary of interviewees' opinions.

Table 7.6 Farmers' responses to statements associated with ecological sustainability

Statements	**Strongly Agree (%)**	**Agree (%)**	**No opinion (%)**	**Disagree (%)**	**Strongly Disagree (%)**
1. Soil erosion reduces agricultural output	63.9	36.1			
2. Soil fertility increases agricultural output	66.7	33.3			
3. Gullies and rills are manifestations of soil erosion	50	47.2	2.8		
4. Existing agricultural practices lead to environmental degradation	27.8	25	27.8	19.4	

Source: Field survey (2013)

The results of Table 7.6 reveal that farmers in both *kebeles* have more or less similar attitudes towards the outcomes and manifestations of soil erosion, regardless of their land management practice. The high degree of agreement among interviewees with the first three statements of Table 7.6 indicates that farmers easily identify soil erosion on their farms, and its impact on soil fertility. However, their attitudes varied about the fourth item, which seeks their responses to the question whether existing agricultural practices lead to environmental degradation. More than half of the interviewees expressed their agreement with the statement that, 'Existing agricultural practices lead to environmental degradation'. This is in line with group discussants' perceptions of the causes of land degradation, as some group discussants mentioned that poor land management is the cause of farmland degradation in our community. The disagreement of nearly 20 per cent of interviewees with the fourth item in Table 7.6 above also shows the diversity of opinion and level of confidence interviewees have in identifying their own solutions to maintaining the ecological sustainability of farmlands. As indicated in Table 7.7 below, poor soil quality was prioritized as one of the most serious problems of farmers in the case study *kebeles*.

Each participant in the in-depth interviews was allowed to rank the most serious problems of farmers in his community (see Annex II, question 48). Table 7.7 summarizes the first three rankings of serious problems prioritized by interviewees from both *kebeles*.

Table 7.7 Interviewees' prioritization of serious problems of farmers in their community

Type of problem	**Ranked first**		**Ranked second**		**Ranked third**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Lack of finance	11	31.4	9	29	6	20.7
Poor soil quality	5	14.3	6	19.4	6	20.7
Pests and diseases	10	28.6	7	22.6	7	24.1
Inadequate farm land	7	20.0	6	19.4	5	17.2
Lack of labour	2	5.7	3	9.7	2	6.9
Lack of market					2	6.9
Tenure insecurity					1	3.4
Total	35	100	31	100	29	100

Source: Field survey (2013)

From Table 7.7 above, one can observe that farmers in the study *kebeles* identified their most serious agricultural problems as lack of finance, pests and diseases, inadequate farmland and poor soil quality. It is also clear that insecurity of land tenure is less important in explaining low agricultural production in the study *kebeles* (see also Table 7.8 below). A possible explanation for this finding could be since local farmers have high perceptions of land tenure security (see results 2, 4 and 5 under Box 7.1) insecurity of land tenure does not appear to be their most serious problem.

The types of agricultural problems ranked first were different across interviewees from the three land management strata. Table 7.8 shows the variations in farmers' perceptions of the most serious agricultural problem (ranked first) across three land management strata.

Table 7.8 Farmers' responses to: What are the most serious agricultural problems of farmers in your community? (ranked first)

Type of problem	**High Performers**		**Moderate Performers**		**Low Performers**	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
Lack of finance	4	33.3	3	25	4	36.4
Poor soil quality	1	8.3	3	25	1	9.1
Pests and diseases	4	33.3	4	33.3	2	18.2
Inadequate farm land	1	8.3	2	16.7	4	36.4
Lack of labour	2	16.7				
Lack of market						
Tenure insecurity						
Total	12	100	12	100	11	100

Source: Field survey (2003)

Table 7.8 shows that the most serious problem encountered by low performers following unsustainable farming practice are lack of finance and inadequate farmland. Equal proportion (36.4%) of interviewees from the low land management stratum prioritized lack of finance and inadequate farmland as their most serious problems. Pests and diseases also equally appeared as a priority problem for a third of interviewees from the group of high and moderate performers. Insecurity of tenure does not appear to be a priority problem of agricultural production among the three groups of interviewees participated in this study. Security of tenure would not be a problem as they have a high perception of land tenure security (see results 2, 4 and 5 under section 7.2). In addition, approximately 36, 42 and 55 per cent of interviewees from the high, moderate and low land management strata have experienced catastrophic shock in the past six years (see Annex II, question 50). The types of shock commonly reported by all groups of interviewees are weather, pest and diseases. Whereas interviewees from the low land management stratum exclusively reported shock types as loss of livestock, illness and death of a family member. This shows that the process of impoverishment (that is, loss of assets and deteriorating living conditions) over time is exacerbated by natural calamities or shock for those farm households that follow unsustainable farming practice, given that lack of finance and inadequate farmland are the most serious problems of interviewees from the low land management stratum.

Moreover, interviewees were asked about their perceptions of environmental problems in their locality (Annex II, question 29) and whether the condition of soil degradation has shown improvement in their community in the past five years (see Annex II, question 30). The results are presented in Table 7.9.

Table 7.9 Environmental problems identified by interviewees

Environmental Problem	**Percent**
Drying up of rivers	91.7
Low and erratic rainfall	86.1
Soil degradation	86.1
Reduced vegetation	83.3
Loss of wild life	63.9
Overgrazing	50.0

Source: Field survey (2013)

From Table 7.9 above, one can observe that soil degradation is regarded as the second major environmental problem mentioned by 86.1 per cent of interviewees drawn from the two *kebeles* and three land management strata. In addition, some interviewees (39%) regarded the soil degradation in their community as having worsened or worsened a lot in the last five years (see Table 7.10 below). Table 7.10 provides a summary of interviewees' perceptions of environmental degradation in their locality.

Table 7.10 Results on interviewees' perceptions of environmental conditions in the past five years

Environmental Condition	**Reduced a lot (%)**	**Reduced a little (%)**	**Same (%)**	**Increased a little (%)**	**Increased a lot (%)**
Soil resource degradation	8.3	50.0	2.8	36.1	2.8
Water resource degradation	5.6	27.8	11.1	50	5.6
Plant resource degradation	2.8	44.4	11.1	36.1	5.6
Animal resource degradation	8.3	22.2	5.6	58.3	5.6
Overall environmental degradation	8.3	38.9	0	41.7	11.1

Source: Field survey (2013)

From Tables 7.9 and 7.10 above one can deduce that soil degradation is regarded as a major environmental problem, although the majority perceived that it had reduced in the last five years, among interviewees from the two case study *kebeles* and three land management strata. This is consistent with the data gathered from group discussants. During the FGDs, farmers stated that there is an ongoing decline in soil fertility with a subsequent decline in crop productivity. They said that the major cause for the decline of soil fertility is soil erosion induced by poor land management practices. They had also witnessed progressive applications of chemical fertilizer over years to augment crop yields on their holdings. Likewise, one focus group participant in Debre Mawi *kebele* gave a typical description of the environmental degradation trends in the study area:

> The vegetative cover used to be dense and full of diverse species before the current demographic change occurs. No chemical fertilizers were needed in farming. Rivers used to overflow their banks at the time of my childhood. Today, the opposite is true.

This comment and the results of Table 7.10 affirm that overall environmental degradation has worsened in the study *kebeles* in the last five years. The results of both FGDs and in-depth interviews revealed that livestock and crop production has had an adverse effect on current environmental problems in the study areas. According to the research respondents, this is mainly for two reasons: first, livelihoods are primarily dependent on agriculture in the study areas; second, despite declining production and productivity, efforts by policy makers to diversify livelihood options away from agriculture are limited. The opinions of study respondents are consistent with the characterization based on secondary data and observation notes in chapters 4 and 5. Pictures 7.1 and 7.2 below show the extent of soil erosion in the study *kebeles*.

Picture 7.2 Gully erosion in Debre Mawi *kebele*

Picture 7.1 Gully erosion in Densa Bahta *Kebele*

Box 7.2 Summary of major results on perception of sustainable land use

Result 8: The six FGDs conducted across *kebeles* and land management strata show group discussants' knowledge of the features of sustainable farmland and the presence of unsustainable land management practices in the study *kebeles*.
Result 9: Group discussants across *kebeles* and land management strata demonstrated their understanding of the causes and manifestations of soil erosion in their locality.
Result 10: Interviewees drawn from the two case study *kebeles* and three land management strata have more or less similar knowledge of the outcomes and manifestations of soil erosion.
Result 11: Interviewees drawn from the two case study *kebeles* identified their most serious agricultural problems were lack of finance, pests and diseases, inadequate farmland and poor soil quality.
Result 12: Pests and diseases virtually appeared as a priority problem ranked first by a third of interviewees drawn from high and moderate land management strata. However, lack of finance and inadequate farmland were appeared as the most serious problem ranked first by interviewees drawn from low land management stratum.
Result 13: Soil degradation was regarded as the second major environmental problem mentioned by 86.1 per cent of interviewees.
Result 14: Some interviewees (39%) said that the condition of soil degradation has worsened or worsened a lot in the last five years.

Except for result 12, the remaining six results summarized in Box 7.2 above affirm four important points in relation to the objectives set out in the thesis. First, group discussants across *kebeles* and land management strata demonstrated similar views of the conceptualization of sustainable land use considered in this research. Second, group discussants and interviewees demonstrated their identical knowledge of and attitudes to the causes and manifestations of soil degradation. Third, more than half of interviewees and some group discussants affirmed that existing agricultural practices lead to the problem of environmental degradation in the study *kebeles*. Fourth, group discussants and interviewees held the opinion that loss of soil fertility is a cause of the declining trend production in the study *kebeles*.

In addition, group discussants and interviewees were participating in the public campaign that aims to cover sub-watersheds with terraces and check-dams during the data collection period. Local farmers in both *kebeles* were mobilized to construct these measures, which involve mitigation and rehabilitation rather than prevention measures. According to Liniger and Critchley (2007:19), a prevention measure refers to the adoption of conservation technologies on farmlands prone to degradation and implies that good land management practice is already in place. Mitigation refers to the adoption of conservation technologies to reduce ongoing degradation and comes at a stage when degradation has already begun. Rehabilitation is required when land is already degraded to such an extent that the original use is no longer possible, and land has become practically unproductive (Liniger & Critchley 2007:19). The various types of terraces and drainage structures introduced through public campaign can be regarded as mitigation measures, while check-dams could be regarded as rehabilitation measures.

Study respondents thus demonstrated perceived lack of power to control soil degradation problems in their localities and sustainable use of farmlands is not yet in place in the majority of fields. Results 8, 9 and 10 reveal study respondents' adequate understanding of the causes and consequences of soil degradation problems in their localities. In contrast, results 13 and 14 depict the ongoing problem of soil degradation in the study areas.

7.4 Knowledge and attitude of farmers to conservation technologies

FGD participants were asked which types of soil and water conservation technologies were familiar a decade ago and currently (see Annex I, questions 6, 7). Farmers showed knowledge of more recent practices, although knowledge of conservation technologies in both periods showed no variation across the two *kebeles* and the three land management strata. Here are some representative quotations:

> A decade ago ... we were accustomed to the traditional diversion ditches.
>
> There was not any terracing practice in our locality a decade ago. We were only familiar to the drainage furrows that can easily be done through ox plough off and across the contour.
>
> Currently we are well aware of the graded soil and stone bunds and check-dams that are introduced by the agricultural extension workers found in our locality.
>
> We are now trained about the construction of cut-off drain structures that substituted the traditional drainage furrows used a decade ago.

From these comments, one can observe that a decade ago farmers' knowledge of conservation technologies was confined to the use of traditional diversion ditches. Currently, they know about graded bunds, cut-off drain structures and check-dams. The agricultural extension service in the study *kebeles* plays an important role in shaping their current knowledge of conservation technologies. During FGDs, participants demonstrated their knowledge of various sorts of physical conservation structures. Some farmers even mentioned their knowledge of biological conservation structures. They indicated that planting fodder trees on the bunds helps to stabilize the physical structures and serves as additional pasture for their livestock.

In addition, the attitudes of interviewees towards conservation technologies were measured with a five-point Likert scale containing seven items with response categories, ranging from Strongly agree to Strongly disagree (see Annex II, question 39). Surprisingly, the opinions of the farmers converged, except for one item, namely that 'Farmers should be paid for construction of terraces. The summarized results are presented in Table 7.11 below.

Table 7.11 Farmers' responses to statements on attitude to conservation technologies

Statements	**Strongly Agree (%)**	**Agree (%)**	**No opinion (%)**	**Disagree (%)**	**Strongly Disagree (%)**
1. Conservation technologies help to reduce soil erosion	55.6	38.9	5.6		
2. Adoption of conservation technologies helps to increase agricultural output	63.9	33.3	2.8		
3. Constructing conservation technologies is a responsibility of GOs and NGOs	41.7	30.6	11.1	16.7	
4. A farmer has an obligation to construct conservation structures	55.6	38.9		5.6	
5. Farmers should be paid for construction of terraces	16.7	30.6	2.8	44.4	5.6
6. Conservation structures have adverse effects on agricultural output	5.6	19.4	5.6	61.1	8.3
7. Constructing conservation structures have adverse effects on household income	11.1	27.8	2.8	52.8	5.6

Source: Field survey (2013)

Farmers in the study *kebeles* are aware of the effects and manifestations of soil erosion (see results 9 and 10, section 7.3). They have good knowledge of and favourable attitudes towards conservation technologies. The interviewees have similar attitudes to statements 1, 2 and 4 (Table 7.11 above), which shows their favourable outlooks on conservation technologies. Majority disagreement with statements 6 and 7 still reflects a positive attitude towards conservation technologies. Agreement with statement 3, which states that 'constructing conservation technologies is the responsibility of GOs and NGOs' may imply a low level of self-efficacy or perceived lack of power to control anthropogenic causes of land degradation.

This reflects their desire for outside assistance or their dependency syndrome, in its worst case, to undertake mitigation and rehabilitation measures to halt human-induced soil degradation prevalent in their locality. Though a marginal majority disagree with statement 5 that, ‘Farmers should be paid for construction of terraces’, a large number of interviewees desire financial rewards for adopting conservation technologies. This desire may arise from two possible reasons. First, interviewees might be aware of ‘food for work’ and ‘cash for work’ strategies that were launched at food-insecure localities for the construction of terraces (see sections 4.6.1 and 5.2.4). Second, farmers may seek financial reward because of their levels of poverty and destitution. This is in line with results 11 and 12, which reflect interviewees’ viewpoints that lack of finance is the most serious problem of agricultural production in their community. Table 7.12 shows the interviewees’ level of agreement with item 5 across the land management strata.

Table 7.12 Response to statement: ‘Farmers should be paid for contraction of terraces’ across land management strata

Land management strata	Strongly Agree (%)	Agree (%)	No opinion (%)	Disagree (%)	Strongly Disagree (%)
High	8.3	33.3	8.3	41.7	8.3
Moderate	25.0	16.7		50.0	8.3
Low	16.7	41.7		41.7	

Source: Field survey (2013)

Opinions of interviewees diverge over whether farmers should be paid for constructing terraces. The level of agreement (Strongly agree + Agree) to the fifth statement by interviewees from the low land management stratum (58.4 per cent) is relatively high compared with the agreement level of interviewees from moderate (41.7%) and high (41.6%) land management strata. Interviewees from the low land management stratum showed a relatively higher desire for financial reward than others. This could be related to their low status of financial capital. Some 67, 50 and 33 per cent of interviewees from the low, moderate and high land management strata, respectively, borrowed money to purchase livestock, improved seed, fertilizer, foodstuffs and to cover medical expenses (see Table 7.17), whereas 8, 27 and 36 per cent of interviewees from the low, moderate and high land management strata, respectively, have borrowed at least ETB50 in the last five years. In other words, the majority of interviewees from the low land management stratum borrowed cash, while a significant minority lent money in the last five years. In addition, those interviewees who have access to credit were asked about the adequacy of credit facilities (see Annex II, question 26) and sufficiency of credit amount for sustainable farming (see Annex II, question 25). The opinions of farmers are shown in Table 7.13.

Table 7.13 Farmers' responses to credit facilities

Farmers' opinions	High performers		Moderate performers		Low performers	
	Frequency	**%**	**Frequency**	**%**	**Frequency**	**%**
The amount of credit I obtained is enough for sustainable farming	3	75	3	50	2	25
The existing credit facilities are adequate	1	25	3	50	4	50

Source: Field survey (2003)

Table 7.13 shows two important issues in relation to interviewees' opinions on credit facilities. First, credit facilities were not adequate for the majority of farmers who follow sustainable farming practice. Only 25 per cent of borrowers from the high land management stratum affirmed the adequacy of existing credit facilities. Second, the amount of credit provided to the majority of farmers who follow unsustainable farming was not sufficient for sustainable farming. Only 25 per cent of borrowers from the low land management stratum agreed that the amount of credit they obtained was sufficient for sustainable farming, as opposed to 50% that indicated that the credit facilities were inadequate. Though a high proportion (66.7%) of interviewees from the low land management stratum borrowed money, the credit was used for other expenses, and not for conservation technologies. The responses show that borrowed money was used to buy livestock, improved seed, fertilizer, foodstuffs and to cover medical expenses. Formal financial institutions are therefore inaccessible to resource-poor farmers in the study *kebeles,* who are unable to provide collateral. The general lack of information by lending institutions about the credit-worthiness of resource-poor farmers is another factor (Amha & Peck 2010; EEA 2011). ACSI follows a group lending modality along with compulsory saving to dispense its credit services. As a result, resource-poor farmers have access to lending only through informal sources and local moneylenders at high interest rates. This is consistent with the findings of earlier studies (see Amare 2002; Amha & Peck 2010; Massow 2000). Above all, credit from informal sources is used neither for sustainable farming nor to diversify livelihood opportunities (see sections 5.4.1 and 5.4.2).

Box 7.3 Summary of results on knowledge and attitude of conservation technologies

Result 15: A decade ago, group discussants' knowledge of conservation technologies was confined to traditional drainage furrows across *kebeles* and land management strata.
Result 16: Group discussants' knowledge of conservation technologies is enhanced through the agricultural extension programme, which acquaints them with physical and biological soil conservation technologies.
Result 17: A significant majority of interviewees demonstrated favourable attitudes towards conservation technologies.

7.5 Perceptions of the impact of land registration and certification on sustainable use of farmlands

During the FGDs, farmers were asked to list the types of land rights given to them through land registration and certification (see Annex I, question 2). The opinions of group discussants show no variation across *kebeles* and land management strata. However, a significant majority of responses were skewed towards the legal obligation to adopt conservation technologies.

Group discussants mentioned these land rights:

- I have the right to rent out my holding for 25 years.
- We have the right to exchange our possessions to consolidate our farmlands.
- The certificate is our legal guarantee during the incidence of border conflict.
- The certificate indicates that men and women have equal land-use rights.

Group discussants mentioned these obligations of landholders:

- The possession right will be terminated if the holder fails to follow proper land management practices.
- I have the obligation to cultivate crop in every production year. I have an obligation to cultivate crops two times per year, if possible.
- A farmer is obliged to construct terraces and check-dams on his holdings.
- A farmer has an obligation to use fertilizer and improved seed varieties.
- We have an obligation to pay the annual tax to the government.

Interviewees' perceptions of landholders' duties were in line with those of group discussants. Approximately 95 per cent of interviewees agreed that, 'A farmer has an obligation to construct conservation structures' (see the fourth statement in Table 7.11 above). In addition, FGD participants were asked, 'How does land certification and registration scheme affect sustainable farming practice in your locality?' (see Annex I, question 9). Opinions did not differ across the *kebeles* and land management strata. These points represent a common feeling across group discussants and show their unanimous perceptions of the incentives and obligations introduced by the land registration and certification scheme for sustainable use of farmlands:

- We are provided with better assurance through the green land certificate[111] to manage our holding by planting fertility augmenting trees and constructing terraces.
- The green land certificate provided to us imposes an obligation to manage our holdings in a sustainable manner by constructing and maintaining terraces, as well as by planting useful trees and shrubs.

Interviewees were asked whether the current land tenure system was a constraint to improved agricultural production and sustainable use of natural resources (see Annex II, questions 10 and 11). Approximately 31 per cent of interviewees affirmed that the current system is a constraint to improved agricultural production and productivity. Equally, 33 per cent of interviewees affirmed that the current system is a constraint to improved and sustainable natural resource use and management. The disaggregated results from interviewees from the three land management strata are indicated in Tables 7.14 and 7.15 below.

Table 7.14 Interviewees' responses: Do you think that the current land tenure system is a constraint to improved agricultural production and productivity in your locality?

Response	Land Management Strata						Total	
	High		Moderate		Low			
	N	%	N	%	N	%	N	%
Yes	3	25	4	33.3	4	36.4	11	31.4
No	9	75	8	66.7	7	63.6	24	68.8
Total	12	100	12	100	11	100	35	100

Source: Field survey (2013)

[111] See Annex III for the cover and contents of the Amhara land certificate.

Table 7.15 Interviewees' responses: Do you believe that the current land tenure system is a constraint to improved and sustainable natural resource use and management?

Response	Land Management Strata						Total	
	High		Moderate		Low			
	N	%	N	%	N	%	N	%
Yes	5	41.7	3	25	4	33.3	12	33.3
No	7	58.3	9	75	8	66.7	24	66.7
Total	12	100	12	100	12	100	36	100

Source: Field survey (2013)

These observations show that land certification and registration could have a negative effect on ecological and socioeconomic aspects of sustainable land use considered in this study, as more than one third of interviewees regard the current system as negative towards these aspects. Ecological sustainability implies that farmlands are used to maintain production (output) levels for current and future generations. The proxy indicator of ecological sustainability is the pattern of crop yield obtained from a particular farmland over years. Socio-economic sustainability implies that ecological sustainability of farmlands by smallholders could continue, given their agro-ecological and socioeconomic diversity. The proxy indicator of socioeconomic sustainability is the pattern of adoption or rejection of conservation technologies over years in each of the case study sites (rural *kebeles*).

However, the opinion of the majority of interviewees could possibly be in line with the positive effects of land certification on ecological and socioeconomic aspects of sustainable land use considered in this study. There is a unanimous perception among group discussants and interviewees that land certification provides an incentive (assurance for security of land tenure) and imposes an obligation on farmers to adopt conservation technologies. Farmers' adoption of conservation technologies because of these incentives and obligations could help to halt further land degradation and start to improve farmlands. Eventually, the maintenance of ecological sustainability of farmlands ensures a viable crop yield from a particular plot over years. The participants of FGDs also affirmed that current agricultural extension services strive to improve the productivity of farmlands through intensive use of chemical fertilizers, organic manure, compost and improved seed varieties. This could possibly lead to higher household income and asset endowments that induce socioeconomic sustainability. Apart from land certification, it was observed that the local governments institutionalized public campaigns to halt the ongoing land degradation in the study *kebeles* by mobilizing the residents for the construction of mitigation and rehabilitation measures (see section 7.6 below, and last paragraphs of sections 5.2.2, 5.3.2, and 5.4.1).

Box 7.4 Summary of major results on perception of effects of land certification towards sustainable use of farmlands

Result 18: Group discussants from the two *kebeles* and three land management strata mentioned their unanimous perceptions of the incentives and obligations introduced by the land registration and certification scheme for sustainable use of farmlands.
Result 19: About 95 per cent of interviewees agreed that a farmer has an obligation to build conservation structures.
Result 20: Group discussants indicated that the current agricultural extension service strives to improve the productivity of farmlands through intensive use of chemical fertilizers, organic manure, compost and improved seed varieties.
Result 21: One third of interviewees believe that the current land tenure system is a constraint to improved and sustainable natural resource use and management.
Result 22: A third of interviewees believe that the current land tenure system is a constraint to improved agricultural production and productivity.

Study respondents are aware of the main provisions of rights and obligations set out in the green land certificate (results 18 and 19). The book of rural land possession, which local farmers call the green land certificate, is a 20-page passport-size booklet in Aramaic. It includes information such as name of husband and wife, list of other family members, and list and size of farm plots possessed by the household (see Annex III for the contents of the booklet). The booklet describes 11 rights and 15 obligations of the possession holder. The main provisions of rights and obligations of the landholder that have an important implication for sustainable farming practice are presented in the subsequent paragraphs.

The main rights of the certificate holder that affect sustainable use of farmlands are:

- Land user right and legal assurance of his or her possession (see 3.1 in Annex III)
- The right to create all assets on the land (see 3.2 in Annex III)
- The right not to be displaced from his or her holding and the right to appropriate compensation in the event of expropriation (see 3.3, 3.6 & 3.8 in Annex III)
- The right to rent land and to bequeath holdings (see 3.4 in Annex III)

- The right to mortgage an asset he or she created on the land (see 3.5 in Annex III)
- The right to obtain the required technical support and expertise to use his or her land for agricultural and natural resource development (see 3.7 in Annex III)
- The right to use trees planted by him- or herself on roads adjacent to his or her holdings (see 3.9 in Annex III)

The main obligations of the certificate holder that affect sustainable farming are:

- An obligation to handle and manage his or her land holdings properly (see 4.1 in Annex III)
- An obligation to seek professional advice regarding assets created on land in order to reduce the potential adverse impact on the environment (see 4.2 in Annex III)
- An obligation to construct flood prevention structures in collaboration with holders of adjacent farmlands (see 4.4 in Annex III)
- An obligation to plough his or her land at a distance from the river or gully that is determined by the land administration authority (for holders whose land is near a river bank or gully) (see 4.8 in Annex III)
- An obligation to plant and care for tree species (for holders whose land is adjacent to the main or feeder road) (see 4.9 in Annex III)

The next section examines these observed patterns of change towards sustainable farming.

7.6 Observed patterns of change towards sustainable farming in the pre- and post-certification periods

The study regarded the adoption and practice of terrace construction, crop rotation, fallowing, tree planting, inter-cropping, and application of manure on farm plots as sustainable farming. Hence, individual interview participants were asked whether they had adopted or rejected these practices in the pre and post certification periods (see Annex II, question 31). Table 7.16 presents the proportion of interviewees engaged in these land management practices in both periods.

Table 7.16 Farmers' practices of land management in pre and post land certification periods

Kebele	Land management practice	Before land certificate	After land certificate
Debre Mawi	Building terraces	6 (33.3%)	17 (94.4%)
	Crop rotation	15 (83.3%)	17 (94.4%)
	Fallowing	6 (33.3%)	2 (11.1%)
	Planting tree	12 (66.7%)	14 (77.8%)
	Inter-cropping	12 (66.7%)	13 (72.2%)
	Application of manure	8 (44.4%)	14 (77.8%)
Densa Bahta	Building terraces	12 (66.7%)	17 (94.4%)
	Crop rotation	14 (77.8%)	18 (100%)
	Fallowing	4 (22.2 %)	0
	Planting tree	14 (77.8%)	18 (100%)
	Inter-cropping	10 (55.6%)	17 (94.4%)
	Application of manure	15 (85.3%)	18 (100%)

Source: Field survey (2013)

Except for fallowing, interviewees in both *kebeles* show improved land management practices in the post-certification period. Though one third of farmers (low land management stratum) from each *kebele* were included in the sample, based on their non-adoption of terracing, they denied this during the interview. This might be for two reasons. First, these farmers might have constructed terraces on other plots held by them that were not sampled during the transect walk. Second, these farmers might have denied their non-adoption for fear of losing their holding (see results 18 and 19 in section 7.5 above). Surprisingly, all interviewees planned to continue these practices for the next five years (see Annex II, question 36). Though fallowing might been abandoned because of land scarcity, the other possible explanation might be the legal obligation farmers have to cultivate their holding in each cropping season (see sections 1.5, 4.2, 5.2.2, 7.5). During FGDs, farmers demonstrated their knowledge of the main provisions of rights and obligations of the landholder. Participants indicated that the green land certificate provides better assurance on their holdings, as well as imposing an obligation to construct terraces and plant useful trees (see result 18 under section 7.5 above).

Interviewees were asked their main reasons for adopting the sustainable land management practices considered in this study (see Annex II, question 35). The main reason provided by interviewees for adopting terracing, crop rotation, intercropping and manuring was their intention to enhance productivity. Economic reasons were their main motives for planting trees around their dwellings and nearby plots. This shows that interviewees from the two *kebeles* and three land management strata demonstrated their knowledge of the short-term and long-term benefits of sustainable farming.

A similar result was obtained from the participants of FGDs. The open-ended question forwarded to the group discussants was 'What economic, social and cultural advantages are experienced by farmers undertaking sustainable land management practices?' (see Annex I, question 5). Their response showed similar results across *kebeles* and land management strata. Their knowledge of short- and long-term benefits of sustainable farming is summarized as follows:

- Constructing terraces reduces fertilizer consumption and prolongs soil moisture and fertility.
- Farmers who build terraces live in harmony with other farmers since they avoid sources of conflicts, such as runoff damage to the crops of adjacent fields.
- Farmers who adopt conservation technologies contribute to the rehabilitation of springs and streams, which will maximize the welfare of the community.
- Farmers who adopt conservation technologies benefit from reduced soil erosion and increased crop production.
- Fodder trees planted on bunds serve as additional feed for livestock.

FGD participants were asked for the reasons behind the observed patterns of change towards the adoption and rejection of conservation technologies in their *kebeles* (see Annex I, question 8). Once again, a similar response was obtained. The representative quotations are presented as follows:

> We abandoned the use of traditional drainage structures since we got adequate information about the adverse effects of these structures from the extension workers assigned here. Initially, we were reluctant to abandon traditional drainage furrows but eventually we are convinced by seeing the merits of graded bunds and cut off drain structures introduced to us by these extension workers.
>
> A decade ago there weren't any extension workers in this kebele and we were accustomed to the traditional diversion ditches that cause soil erosion and conflict among neighbouring farmers. Today, thanks to the soil and water conservation extension agent assigned to the kebele and mass mobilization, the majority of our farmlands are covered with terraces, modern diversion ditches and check-dams.
>
> Today our landscape is changed due to the campaign that mobilized the residents of the kebele for watershed-based built up of terraces, diversion ditches and check-dams.

> Our farmlands are currently covered with terraces and check-dams due to the authoritarian campaign and the ban of our livestock grazing to crop residues on those fields covered by terrace.

The similar responses show that the pattern of change may be ascribed to local farmers' similar perceptions of risks. Their perceptions of risks and use of conservation technologies is conditioned by factors associated with the synergy of the technical, economic and of social organizational relationship domains. The first two quotations (above) indicate that group discussants abandoned traditional drainage furrows, because they caused soil erosion. They obtained the technical knowhow of modern cut-off-drain structures and graded terraces from agricultural extension workers assigned to their locality. The second and the third quotations reveal farmers' perceptions of risks associated with social organizational relationships. They indicated that the public work in which every *kebele* resident is obliged to participate was partly responsible for this change. The fourth quotation indicates group discussants' perceptions of the likelihood of socio-organizational risks, and they expressed their fear of the commands and directions given by local authorities. They expressed their obedience to the ban on livestock grazing of crop residues on fields covered by terraces and check-dams. Avoidance of open grazing[112] helps to maintain the stability of terraces and other structures built on farmlands through public work.

The public campaign that aims to cover sub-watersheds with conservation structures reflects mitigation and rehabilitation interventions to reduce land degradation. This campaign was launched in 2011 in all rural *kebeles* of the Amhara region by organizing farm households into village- *(got)* level development teams. The regional Bureau of Agriculture and Rural Development is responsible for providing technical assistance through *woreda-* and *kebele-* level development workers. At grassroots, public mobilization is handled by a pool of government officials who have the authority to penalize farmers who fail to participate.

Overall, the post-certification period witnessed improved adoption of sustainable land management practices in the study *kebeles*. In this period, farmers were provided with information about the rights and obligations that foster sustainable farming practice (see results 18 and 19). In addition, the support mechanisms were in place. These two major

[112] Open grazing is a practice of allowing livestock to graze on crop residues left on farmlands after crop harvest.

institutional support mechanisms are the agricultural extension package and the campaign institutionalized in the study *kebeles*. The agricultural extension package enhances local farmers' knowledge of and skills on conservation technologies and sustainable land management practices. Some 83, 75 and 33 per cent of interviewees from high, moderate and low land management strata, respectively, were included in the current agricultural extension programme (see Table 7.17). This result shows the disadvantageous position of those interviewees that follow unsustainable farming practice regarding to their access to agro-support network and community level organizations. The campaign, which aims to cover sub-watersheds with physical conservation structures, would make a valuable contribution to assisting disadvantaged households (such as female-headed households) with limited productive labour force. They could escape the probability of losing their holding by not doing conservation structures on their farmlands, as per an obligation imposed to them by the land certificate. The campaign could also ensure the availability of technically viable physical conservation structures, which fulfil the required technical standard, across fragmented farm plots. This view was reflected in an assertion by one FGD participant in Densa Bahta *kebele*.

> During an earlier time, the holdings of female-headed households were not often covered by terraces but now all adjacent farmlands, irrespective of the sex of a plot holder, are covered with terraces constructed through a campaign.

However, the development discourse follows a technocratic approach, in contrast to the populist approach, which acknowledges indigenous knowledge. Local authorities need to be cautious about the adverse effects of campaign and disallowance of livestock grazing on crop residues. Pictures 7.3 and 7.4 depict the current farmers' campaign to cover sub-watersheds with various soil and water conservation structures.

Picture 7.4 Farmers constructing terraces in a campaign

Picture 7.3 Public campaign in Debre Mawi *kebele*

At the time of taking these pictures, the researcher could not see a positive attitude, enthusiasm or passion from farmers engaged in public work to construct terraces. Instead, he was exposed to their comment that '*Ere yehe erken sira bamet bamet fejen*', which explains to their exhaustion with such campaigns. In addition, during the fieldwork, the researcher learnt about local farmers' displeasure with the current campaign and the ban of livestock grazing to crop residues on farmlands covered by check-dams and terraces through the public campaign. The sustainable long-term effect of this authoritarian development intervention is doubtful mainly for two reasons. First, if farmers were not enthusiastic about public campaigns, they might construct poor-quality physical conservation structures. Poor-quality physical conservation structures (terraces, check-dams and cut-off drain structures) would obviously have a shorter lifespan with more devastating impact on the ongoing land degradation when floods captured by the structures, obtain outlets at unintended points. Second, if local authorities lose their political power, farmers might demolish the physical conservation structures and violate the ban of livestock grazing. Historically, Ethiopian farmers abandoned and demolished terraces and check-dams built on their holding in the 1980s subsequent to the fall of the Derg regime. However, the current regime set mechanisms in place to shift from authoritarian public campaign interventions to sustainable and grassroot-level administration of natural resources through active participation of user communities. New legislation was issued by ANRS on 11 July 2013 to determine the administration and use of watersheds rehabilitated and being rehabilitated by public campaign intervention. The council of ANRS issued proclamation Number 204/2013 to establish procedures of use, protection and accountability of administering natural resources through active users' participation in the watersheds.

Box 7.5 Summary of major results on observed patterns of change in post-certification period

Result 23: Interviewees from both *kebeles* have positive attitudes to the adoption and use of terrace construction, crop rotation, tree planting, inter-cropping, and an application of manure during the post certification period.
Result 24: All interviewees have expressed their plan to keep practicing these sustainable land management practices for the coming five years.
Result 25: In both *kebeles* the practice of fallowing has declined in the post certification period.
Result 26: Group discussants and interviewees drawn from the two *kebeles* and three land management strata demonstrated sufficient knowledge of short-term and long-term benefits of sustainable farming.
Result 27: Group discussants mentioned several reasons for the observed patterns of change in the adoption and continued use of sustainable land management practices. The most frequent reasons are: (i) the technical knowledge and skill obtained from the agricultural extension service, (ii) the Green land certificate that provides better assurance on their holdings as well as imposes an obligation for constructing terraces and planting useful trees, (iii) the public campaign for watershed based build up of terraces, diversion ditches and check-dams, (iv) the ban of livestock grazing to crop residues on those fields covered by terraces and check-dams.

7.7 Factors that affect the sustainable use of farmlands

Several factors thus mediate the sustainable use of farmlands in the study *kebeles*. The pre-decisional processes are often influenced by factors that shape the behaviour of smallholders' towards a particular farming practice at a certain time. The inner circle in Diagram 7.2 below shows that 'knowledge and attitude', 'productive asset holdings', 'self-efficacy' and 'technology adoption and risk perception' mediate the decision of smallholders' towards a particular farming practice at a certain time. In simple terms, the pre-decisional processes correspond to those factors that mediate adoption of conservation technologies at a certain point in time. However, adoption of conservation technologies alone may not lead to sustainable use of farmlands unless the technologies are utilized continuously. A single-headed arrow that connects farming practice with sustainable use of farmlands, and a double-headed arrow that connects the middle circle with the outer circle in Diagram 7.2 below illustrate the dynamism of this post-decisional process for sustained use of conservation technologies. Diagram 7.2 gives the generic analytical framework that is used (see Diagram 3.3 and section 3.4) to consolidate the synergy of potential factors that could affect the sustainable use of farmlands in Amhara region.

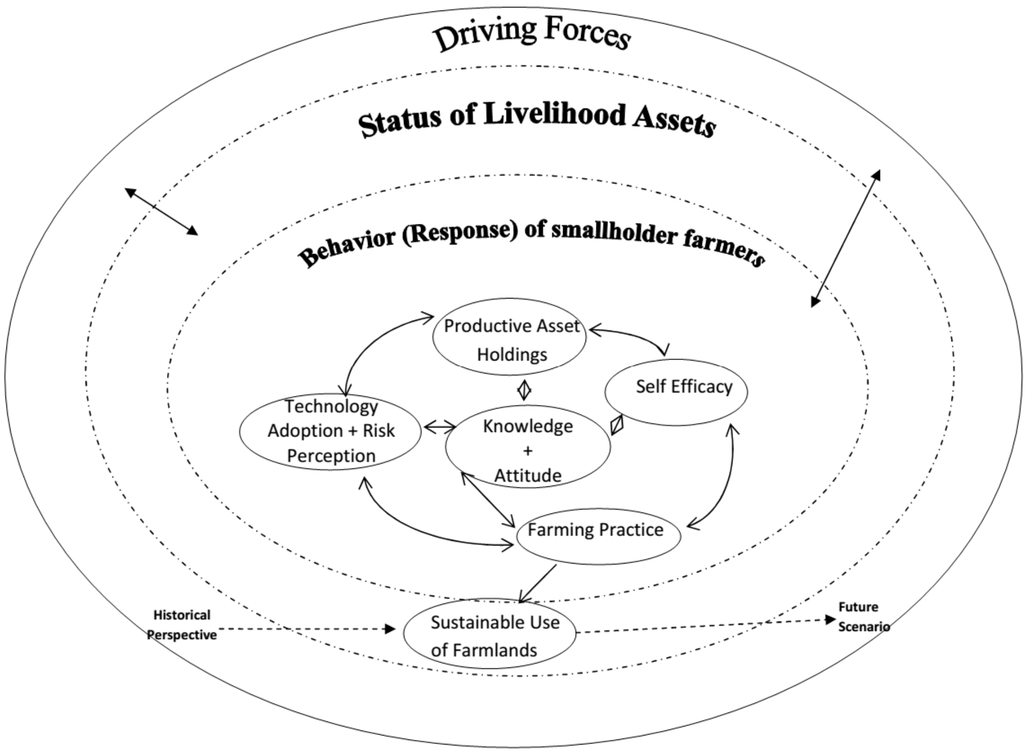

Diagram 7.2 Analytical framework used in this study

An attempt was made to explain how the elements of Diagram 7.1 were measured in the research process. This explanation was followed by a summary of the empirical findings about the variables that are expected to determine a given farming practice. These are driving forces; knowledge and attitude; productive asset holdings; self-efficacy and technology adoption; and risk perception (Diagram 7.2 above).

7.7.1 Driving forces

'Driving forces' have profound implications for the intermingled causes of rural poverty. Driving forces can be identified on three levels: macro, meso and micro. Driving forces originating at national or regional level for example land-use policy have 'downward' consequences on local farmers' use and management of land resources. Others originate at individual level with 'upward' consequences. For example, the number of children a woman has affects fertility rates and population growth, which have macro-level implications. Driving forces that originate at meso level, such as community land shortage, soil erosion and deforestation, can have consequences in both directions, such that households face land shortage (micro-level implications) and loss of agricultural production or productivity (macro-level implications).

Driving forces comprise three aspects: i) the vulnerability context associated with demography and land degradation; ii) shocks associated with droughts, flood, pest and diseases; iii) transforming structures and processes found at various spatial levels, such as laws, policies and institutions that allocate means of production and distribution of outputs. Driving forces or 'external conditioning variables' (Reardon & Vosti 1995) are expected to be uniform for households in a particular agro-climatic or policy context. Chapter 5 showed that the two case study *kebeles* have similar agro-climatic and policy contexts (see section 5.4).

The vulnerability context associated with land degradation was high in the study *kebeles*. Result 13 indicated that soil degradation is regarded as the second major environmental problem and was mentioned by 86.1 per cent of interviewees. In addition, result 14 indicated that 39 per cent thought that conditions of soil degradation have worsened or worsened a lot in the past five years. This affirms that the current farming practice is the driving force since it determines the status of livelihood assets of farm households. This effect is represented in Diagram 7.2 by a single-headed arrow that connects 'farming practice' to 'sustainable use of farmlands' and a double-headed arrow that connects the middle circle with the outer circle.

Driving forces arising from shocks, and transforming structures and processes shape the livelihood strategies of smallholders, and thus their farming practices in the study *kebeles*. Interviewees identified their most serious agricultural problems as lack of finance, pests and diseases, inadequate farmland and poor soil quality (result 11). Poor soil quality corresponds to driving forces arising from the vulnerability context (above). Lack of finance and inadequate farmland point to driving forces arising from transforming structures and processes. Pests and diseases indicate driving forces arising from shocks. Result 12 indicated that pests and diseases were a priority problem, ranked first by one third of interviewees from high and moderate land management strata. However, lack of finance and inadequate farmland were ranked first by interviewees from the low land management stratum. Policies that aim at achieving sustainable livelihood outcomes should aim at increasing the productive asset endowments of resource-poor farmers.

Some 36.4, 41.7, and 54.5 per cent of interviewees from high, moderate and low land management strata, respectively, experienced catastrophic shock after land registration and certification. The types of shock reported by all groups of interviewees were weather, pest and diseases. Interviewees from the low land management stratum exclusively reported types of shock as loss of livestock, illness and death of a family member. The process of impoverishment (that is, loss of assets and deteriorating living conditions) over time is exacerbated by natural calamities or shock for those farm households that follow unsustainable farming practice.

The issues of land shortage and inequitable land distribution were echoed by one third of group discussants from the low land management stratum and by 25 per cent of interviewees who expressed their dissatisfaction with the current land tenure system (result 3). Group discussants drawn from the low land management stratum in both *kebeles* highlighted the issue of land shortage as a major impediment to adoption of conservation technologies (result 6). The average size of registered and certified farmland among interviewees from high, moderate and low land management strata was 1.2, 1 and 0.75 hectares, respectively (result 7). These results provide evidence of the possible negative effects of inequitable land allocation on adoption of conservation technologies. Households with low per-capita land holdings were probably in the low land management stratum.[113] The agricultural production of those farmers that follow unsustainable land-use practice was jeopardized by lack of finance and shortage of land (see result 12). This hints at divergence between policy texts and development practice towards enhancing the productive assets of vulnerable and destitute households in the discourse of sustainable development. One third of interviewees believe that the current land tenure system is a constraint to improved and sustainable natural resource use and management (result 21). Equally, one third of interviewees believe that the current land tenure system is a constraint to improved agricultural production and productivity (result 22). From these results, one can deduce the possible negative impact of the current land tenure system on the sustainable use of farmlands in the study *kebeles* since land certification has failed to address inequality in possession of farmlands. Inequitable allocation of farmlands might also have an adverse effect on equity and efficiency aspects of resource use. The average size of farmland owned by interviewees from the low land management stratum was smaller than the average land holding size in the study *kebeles* (see sections 4.5.1 and 4.5.2) and Amhara

[113] The mean value of per capita land holding was found as 0.79, 0.77, and 0.66 *quada* among interviewees disaggregated into high, moderate and low land management strata, respectively.

region (see section 5.2.2). Provisional land certificates were provided to smallholders in the study *kebeles* based on the amount of farmland allocated to them in the 1997 land redistribution (section 7.2).

In contrast, this thesis provides insight into the potential positive prospects of land certification towards sustainable use of farmlands in the case study *kebeles*. The results show the positive impacts of the current land tenure system on investment in conservation technologies, thus sustainable usage (see results 18, 19, 23, 24 and 27). The land registration and certification scheme has contributed to a high perception of land tenure security across the three land management strata and the two case study *kebeles* (see results 2 and 5). This high perception of land tenure security, along with the legal obligation of farmers have to adopt proper land management practices (results 18, 19 and 27), has contributed to improved adoption of sustainable farming practices in the post certification period. These sustainable farming practices were terrace construction, crop rotation, tree planting, inter-cropping, and an application of manure (see results 22, 23 and 26). Therefore, the current land tenure system is an important driving force that has both positive and negative impacts on sustainable use of farmlands. The positive impact of the current land tenure system is two pronged. First, land certification has shown an assurance effect to enhance the perception of land tenure security among farmers in the study *kebeles*. Second, provision of the land certificate imposed a legal obligation on local farmers to adopt proper land management practices. The negative impact of the current land tenure system arises from its failure to reconsider the land holding size of a few disadvantaged farm households in the 1997 land redistribution. Provisional land certificates were provided to farmers in the study *kebeles* based on their land holding size in the 1997 land redistribution.

The above findings are in line with the analytical framework used in the study to examine the pre-decisional and post-decisional processes for the adoption and sustained use of conservation technologies. The pre-decisional processes are often mediated by factors that affect adoption of conservation technologies at a certain time. Adoption of conservation technologies alone may not lead to sustainable use of farmlands unless the technologies are utilized continuously. The dynamism of this post-decisional process for sustained use of conservation technologies is represented by a double-headed arrow that connects the outer circle (driving forces) with the inner circle (behaviour or response of smallholders), and a single arrow that connects farming practice with sustainable use of farmlands in Diagram 7.2

above. In view of this, based on the empirical results discussed in this section, one can deduce that the post-decisional processes for sustained use of conservation technologies could be mediated by driving forces arising from these aspects:

- The vulnerability context of land degradation
- Shocks in the form of loss of livestock, illness and death of a family member
- Transforming structures and processes such as current land-use policy and institutional credit facilities

7.7.2 Knowledge and attitude

The study measured respondents' knowledge of and attitude towards land tenure security and sustainable use of farmlands from their responses to statements and questions in the primary data-gathering instruments. Knowledge was measured from responses to questions of perceptions about soil degradation, land tenure security and conservation technologies. Attitude was measured from responses to questions of behavioural responses about soil degradation, land tenure security and conservation technologies. The findings are summarised below.

Result 1: No group discussant mentioned any similarity between the Derg and the current land tenure systems, and no one mentioned that land was owned by the state in both regimes.
Result 4: The majority of interviewees (94%) affirmed that their perception of security of land tenure was associated with their access to and use of land for farming.
Result 5: The perception of land tenure security was high across the two *kebeles* and the three land management strata since the attitude score of interviewees lies within a favourable range.
Result 8: The six FGDs conducted across *kebeles* and land management strata show group discussants' similar knowledge of the features of sustainable farmland and the presence of unsustainable land management practices in the study *kebeles*.
Result 9: Group discussants across *kebeles* and land management strata demonstrated their understanding of the causes and manifestations of soil erosion in their locality.
Result 10: Interviewees drawn from the two case study *kebeles* and three land management strata have more or less similar knowledge of the outcomes and manifestations of soil erosion.
Result 15: A decade ago, group discussants' knowledge of conservation technologies was confined to traditional drainage furrows across *kebeles* and land management strata.
Result 16: Group discussants' knowledge of conservation technologies is enhanced through the agricultural extension programme, which acquaints them with physical and biological soil conservation technologies.
Result 17: A significant majority of interviewees demonstrated favourable attitudes towards conservation technologies.

Result 23: Interviewees from both *kebeles* have positive attitudes to the adoption and use of terrace construction, crop rotation, tree planting, inter-cropping, and application of manure during the post certification period.
Result 24: All interviewees have expressed their plan to keep on practising these sustainable land management practices for the coming five years.
Result 26: Group discussants and interviewees drawn from the two *kebeles* and three land management strata demonstrated sufficient knowledge of short-term and long-term benefits of sustainable farming.

Farmers' knowledge of soil degradation, land tenure security and conservation technologies was similar across the three land management strata and the two case study *Kebeles*. They have a positive attitude towards conservation technologies and sustainable land management practices. This can be ascribed to the uniform effect of several driving forces (see section 7.7.1 above) in shaping the knowledge and attitudes of farmers in an identical policy and agro-ecological environment (Reardon & Vosti 1995). Farmers' adequate knowledge of and favourable attitudes towards soil conservation, land tenure security and conservation technologies contributed to improved adoption of sustainable farming practices in the post-certification period. In contrast, the presence of unsustainable land management practices (result 8) and soil degradation (results 13 and 14) in the study *kebeles* implies that adequate knowledge and favourable attitudes could be mediated by another set of variables in the analytical framework among those farmers that follow unsustainable farming practice. This observation hints that a decision on a given farming practice requires a congruence of the other four sets of variables with adequate knowledge and favourable attitude. Thus, one may conclude that instead of a direct cause-effect relationship between knowledge and attitude to the one hand and farming practices on the other hand, there is a synergy among 'knowledge and attitude', 'productive asset holdings', 'risk perception and technology adoption' and 'self-efficacy' for a particular farming practice at a certain time. This dynamism of the pre-decisional process for adoption of conservation technologies is represented in the analytical framework by the double arrows connecting the variables included in the inner circle of Diagram 7.2 above.

The findings provide empirical evidence for the farming system model introduced by Leeuwis and Van den Ban (2004). This model (see section 3.3) indicates that a variety of cultural, technical, economic and relational aspirations and preferences shape an individual farmer's land management practices. In contrast, the empirical result obscures the validity of assertions made by the economic theory of property rights (see section 2.3.2). According to this theory, high perception of land tenure security automatically leads to enhanced agricultural production and sustainable use of farmlands. Though most study respondents perceived their land tenure security to be high, unsustainable land-use practices and soil degradation were evident in the study *kebeles*. This implies that enforcing land rights and obligations for proper farming practices is not sufficient to determine the adoption and sustained use of conservation technologies. In the context of the study *kebeles*, factors other than security of land tenure influenced farming practice. The analytical framework captured these other factors in the form of a set of variables, comprising driving forces, productive asset holdings, self-efficacy, and technology adoption and risk perception. The following section provides the findings and analysis regarding the productive asset endowments among interviewees drawn from three land management strata.

7.7.3 Productive asset holdings

The analytical framework considered six types of livelihood capitals: natural, physical, social, human, financial and cultural. The in-depth interview consisted of 25 open- and close-ended questions to measure and compare important aspects of these livelihood capitals that could determine the productive asset endowments of farm households. The term 'productive asset' refers to those aspects of livelihood capital that are used directly for agricultural production and affected by agricultural productivity.

The results show evidence of the effects of productive asset endowments on interviewees' farming practice. Table 7.17 summarizes the productive asset holding of the farmers in both *kebeles* using selected indicators for human, natural, physical, financial, social, and cultural capital.

Table 7.17 Distribution of important productive assets owned by interviewees in pre- and post-certification periods

Number	Indicators of variable of interest	Land Management Strata			Type of capital
		High	**Moderate**	**Low**	
1	Mean of the household head age	47	39	45	Human
2	Mean of family size-post certification period	8	6	5.73	Human
3	Mean of family size-pre certification period	7.33	5.08	4.64	Human
4	Mean male household member-post certification period	4	3.17	2.82	Human
5	Mean male household member-pre certification period	3.58	2.5	2.45	Human
6	Mean female household member-post certification period	3.92	2.83	2.91	Human
7	Mean female household member- pre certification period	3.67	2.58	2.18	Human
8	Average farm size certified measured in *quada*[114]	6	4.2	3.2	Natural
9	Average farm size before certification	6.15	4.18	3.63	Natural
10	Mean of per-capita farmland certified	0.79	0.77	0.66	Physical
11	Mean of livestock owned measured in TLU[115]-post certification	5.17	3.77	2.59	Physical
12	Mean of livestock owned measured in TLU-pre certification	5.1	2.8	3.75	Physical
13	Percentage of houses roofed with corrugated iron post certification	91.7	100	83.3	Physical
14	Percentage of houses roofed with corrugated iron- pre certification	75	50	33.3	Physical
15	Percentage of households who reported their access to credit services (borrowed)	33.3	50	66.7	Financial
16	Proportion of households who lent at least 50 Birr in the last five years	36.4	27.3	8.3	Financial
17	Proportion of households who adopted non-farm business before land certification	27.5	25	25	Financial
18	Mean of per-capita annual expenditure in Birr (at the time of data collection)	3945	3409	3027	Financial
19	Mean value of tenure security index	27.3	26.3	23.6	Social
20	Proportion of households included in the current agricultural extension programme	83.3	75	33.3	Social
21	Proportion of households who have an affiliation to a political party	90.9	50.0	36.4	Social
22	Percentage of respondents who have a participation in *Senbete*	45.5	41.7	36.4	Social
23	Proportion of households who expressed their easily access to labour and livestock sharing arrangements	100	75.0	83.3	Cultural

Source: Field survey (2013)

[114] The researcher used local farmers unit of measurement for the size of farmland *(quada)* instead of hectare because of the absence of an empirically tested conversion factor. Commonly, it is assumed that four *quadas* are equivalent to 1 hectare.

[115] TLU refers to tropical livestock unit, which is an index computed with a conversion factor (Jahnke 1982, in EEA (2002:109). The following conversion factors are thus used in this study: camels (1.0), cattle (0.7), sheep (0.1), goats (0.1), horses (0.8), mules (0.7), asses (0.5), pigs (0.2) and chickens (0.01).

Table 7.17 shows a sharp contrast in possession of all six productive assets between interviewees from the high and low land management strata in the pre and post certification periods. The disadvantageous position of interviewees from the low land management stratum in natural capital indicators in Table 7.17 was consistent with results 3 and 6. Group discussants from the low land management stratum highlighted shortage of land as a major impediment to adopting conservation technologies. For example, 'lack of farmland is the most serious agricultural problem as some individuals in large families cannot have a piece of land for farming, let alone covering it by bunds' (FGD participant in Debre Mawi *kebele*). 'Shortage of farmland is a major impediment to adoption of terraces since terrace construction competes for the small plot I own' (FGD participant in Densa Bahta *kebele*). In addition, interviewees from the low land management stratum were in a disadvantageous position in terms of human, natural, physical, financial, social and cultural capital. The disadvantage of lack of productive assets directs their farming towards unsustainable land management practices, which reinforces their detrimental position and aggravates the low level of productive assets owned by these households. Result 12 indicated that lack of finance and inadequate farmland were ranked as serious problems by interviewees from the low land management stratum.

Table 7.17 above shows that the average family size of the three groups of interviewees increased between the pre-and post-certification periods. This indicates a similar trend of the effect of driving forces associated with demography among the three groups of farmers. The increase of the average family size points to ever-increasing farming populations that are claimants to scarce farmlands. Population growth in the study *kebeles* may have a positive or a negative impact on the sustainable use of farmlands. Table 7.17 show an increase in the possession of livestock between pre and post certification among interviewees from high and moderate land management strata (indicators 11 and 12). Conversely, these indicators show a decrease pattern among interviewees from the low land management stratum. There are two possible explanations. First, a dissimilar pattern of change on the selected indicator among the three groups of farmers may show that the effect of driving forces in mediating their access to productive assets or capitals was not uniform. Interviewees from the low land management stratum exclusively reported shock in the form of loss of livestock (section 7.7.1). Second, there might be a substitution between capitals and within a given capital. For example, a household might sell livestock and build a house (see indicators 13 and 14 in Table 7.17 above).

The literature (eg Fernandes & Woodhouse 2008; Reardon & Vosti 1995; Scherr 2000; Wannasai & Shrestha 2007; Vilei 2011) reveals that the income and investment strategies of poor farmers are conditioned by a complex interplay of factors. The prevailing driving forces associated with vulnerability, shocks and transforming structures and institutions dictate the productive asset endowments of farm households. In addition, subsistence agricultural production and resource conservation technologies depend on household asset endowments and require modification of technical rates of substitution among livelihood assets, especially between human-made assets and natural resources. Differential access to productive asset holdings among farm households therefore affects the costs, returns and risks of conservation investments, and thereby the sustainable use of farmlands.

7.7.4 Self-efficacy

The starting point of self-efficacy is assets or capital endowments owned, controlled, claimed or accessed by farm households (see section 3.2.2). The prevailing driving forces in a given locality mediate these productive assets (see sections 3.2.1, 3.2.3). Self-efficacy is measured in terms of ability to mobilize resources, availability of skills and competence, effectiveness of agro-support network and of (inter) community organizations (Leeuwis & Van den Ban 2004). The research assessed the self-efficacy of interviewees based on indicators 20–23 in Table 7.17 above, and behavioural responses to in-depth interview questions (see Annex II, questions 40 to 44).

Interviewees from the low land management stratum that follow unsustainable farming practices were disadvantaged in terms of the indicators of human, natural, physical, financial, social and cultural capital (Table 7.17). This detrimental position reinforced their perceived lack of power to control environmental degradation in their community, based on the following results. Interviewees were asked whether their household had the required skills and competency to adopt conservation technologies (see Annex II, question 42). Approximately 67, 75 and 100 per cent of interviewees from the low, moderate and high land management strata, respectively, reported that their household had the required skills and competency to adopt conservation technologies. In addition, interviewees were asked about their ability to mobilize local economic resources to construct conservation structures on their holdings (see Annex II, question 40). Approximately 75, 83 and 100 per cent of interviewees from the low, moderate and high land management strata, respectively, affirmed that they could easily mobilize local economic resources to balance deficits of their household to adopt conservation technologies. Most interviewees reported a favourable response to items designed to measure their self-efficacy (see Annex II, questions 40 to 44). These results may arise from their legal obligations to adopt conservation technologies under the current land tenure system (see results 18, 19, 27). Indicators 20, 21, 22 and 23 of Table 7.17 show the disadvantageous position of those interviewees that follow unsustainable farming practice regarding their access to an agro-support network and community level organizations. Indicator 20 shows that 83 and 33 per cent of interviewees that follow sustainable and unsustainable farming practices, respectively, were included in the current agricultural extension programme. Indicator 21 shows that 91 and 36 per cent of interviewees that follow sustainable and unsustainable farming practice, respectively, were affiliated to a political party. Indicator 22 shows that 46 and 36 per cent of interviewees that follow sustainable and unsustainable farming practice, respectively, participate in *Senbete*. Indicator 23 shows that 100 and 83 per cent of interviewees that follow sustainable and unsustainable farming practice, respectively, have easy access to labour and livestock sharing arrangements in their community.

Study respondents that follow unsustainable farming practice thus demonstrated a low level of self-efficacy in solving the problem of land degradation. This is because of their relatively disadvantageous position in possession of the six productive assets considered in this study. In addition, the process of impoverishment or depletion of productive assets is exacerbated by natural calamities or shock (see section 7.7.1 above) and low-level institutional support systems (agro-support network and community organizations) for respondents that follow unsustainable farming practice (see the last four indicators of Table 7.17). This unsustainable farming practice aggravates the low status of productive assets owned by these households, since land degradation perpetuates the vicious circle of low income and poverty. In the context of the study areas, where farmlands are the principal means of support for rural livelihoods, land degradation would become an adverse driving force that could result in lower agricultural output, lower farm income, lower nutritional status, poor health and reduced schooling for children, as well as fewer livestock and farm implements for the next production period. The SLA regards awareness of the productive assets of poor farmers as crucial to an understanding of the options open to them in sustainable land management (Ellis & Allison 2004:3).

7.7.5 Technology adoption and risk perception

The research traced the patterns of adoption and rejection of conservation technologies, along with common justifications, in the pre- and post-certification periods. Adoption refers to the practice of households' investing in locally known conservation technologies, while rejection refers to their withdrawal from these practices. These technologies were disaggregated into terrace construction, crop rotation, fallowing, tree planting, inter-cropping, and application of manure on farm plots. The pattern of change towards sustainable farming practice in the post-certification period is ascribed to farmers' perception of risks. This is conditioned by factors associated with the synergy of the technical domain, economic domain and social organizational relationships. About the technical domain, it is indicated that group discussants abandoned traditional drainage furrows because of the observed soil erosion caused by the technology. Farmers discarded traditional drainage furrows after they obtained the technical knowhow of modern cut-off drain structures and graded terraces through the agricultural extension workers assigned to their locality. Over time, they have become convinced of the shortcomings of traditional drainage furrows and the advantages of modern cut-off drain structures and graded terraces. An economic reason that convinced farmers was the observed loss of agricultural output caused by soil erosion in their locality. They were also convinced because they realized there was unintended conflict with downstream farmers because of flood damage caused by the traditional drainage furrows.

The observed pattern of change in farming practice in the post-certification period may have arisen because of several factors. This could be due to farmers' obligation to adopt conservation technologies under the current land tenure system. In addition, the campaign that aims to cover sub-watersheds with physical conservation structures through administrative and authoritarian procedures might be responsible. Moreover, this could be because of the study respondents' knowledge of short-term and long-term benefits of sustainable farming.

Given the unanimous knowledge and attitudes of study respondents across *kebeles* and land management strata (see section 7.7.2 above), driving forces of the external environment have shown profound effects on differential possession of productive assets among the three groups of farmers (see section 7.7.1 and 7.7.3 above). The study affirmed the disadvantageous position of those farmers that follow unsustainable farming practice in the possession of the six productive assets. A set of variables that determine the productive asset holdings further dictate farmer's options and sustainable land management practice through their effect on self-efficacy and risk perception. The pre-decisional processes for adopting conservation technologies among those farmers that follow unsustainable farming practice were thus jeopardized by their disadvantageous position in possession of productive assets, their low level of self-efficacy and higher perception of risks since terrace construction and tree planting competes for the small farmland they possess. Above all, the pre-decisional processes for adoption of conservation technologies triggered by post-decisional processes among those farmers that follow unsustainable farming practice since land degradation depletes the status of their productive asset endowments.

Therefore, the study found that the driving forces of the external environment mediate the status of productive asset endowments among smallholders and shape their farming practices in the study areas. These practices determine the status of renewable natural capital (farmland) on which their livelihood depends. The status of this natural capital, along with other five forms of capital, determines the differential access to productive assets among these three groups of farmers considered in this thesis. The status of productive asset holdings could be mediated by several driving forces, and will shape farmers' future sustainable land management practices through its synergy with knowledge and attitudes, self-efficacy and risk perception. Study respondents' knowledge of and attitudes to security of land tenure and conservation technologies do not vary across the two *kebeles* and three groups of farmers. This hints at the relative importance of productive asset endowment, self-efficacy and risk perception on sustainable use of farmlands in Amhara region.

7.8 Conclusion

The chapter indicated that the views, knowledge of and attitudes of farmers to the impact of land certification on the sustainable use of farmlands were similar across the two *kebeles* and three land management strata. The majority of interviewees (75%) and group discussants (2/3) affirmed that they had secure user rights over their holdings under the current land tenure system. The perception of land tenure security as a result of land certification was high across the two *kebeles* and three land management strata. Group discussants and interviewees indicated their unanimous perceptions of the incentives and obligations introduced by land registration and certification scheme for sustainable use of farmlands. Interviewees from both *kebeles* showed improved adoption and continued use of terrace construction, crop rotation, tree planting, inter-cropping, and application of manure in the post-certification period. Group discussants mentioned several reasons for the observed patterns of change in the adoption and continued use of these sustainable land management practices in this period. The most frequent reasons given by group discussants were i) technical knowledge and skills obtained from the agricultural extension service; ii) the green land certificate; iii) the campaign for watershed-based terraces, diversion ditches and check-dams; and iv) the ban on livestock grazing on crop residues in fields covered by terraces and check-dams.

Chapter 7 investigated factors that affect the sustainable use of farmlands in Amhara region with the aid of a generic analytical framework. It attempted to show that driving forces arising from land degradation; shocks such as loss of livestock, illness and deaths of family members; and transforming structures and processes such as the current land-use policy and institutional credit facilities, which could mediate sustainable farming practice in the case study *kebeles*. The current land-use policy has positive and negative impacts on sustainable use of farmlands in the study *kebeles*. The positive impact of the policy is its assurance effect in enhancing the perception of security of tenure among farmers, coupled with their legal obligation to adopt sustainable farming practice. The negative impact involves its failure to consider the size of land holding for a few disadvantaged households in the 1997 land redistribution. Small farm size and lower per-capita land holding were constraints to adopting conservation technologies. There is a synergy between 'knowledge and attitude', 'productive asset holdings', 'risk perception and technology adoption' and 'self-efficacy' of farmers to adopt a particular farming practice at a certain time. Differential access to productive assets among farm households affects the costs, returns and risks of conservation investments, and thereby the sustainable use of farmlands. Study respondents that follow unsustainable farming practices were relatively disadvantaged in possession of all productive assets and demonstrated a low level of self-efficacy in solving the problem of land degradation. The pre-decisional processes for adoption of conservation technologies by these farmers were jeopardized by their higher perception of risks, since terrace construction and tree planting compete for their small farmland. The process of impoverishment or depletion of productive assets is exacerbated by natural calamities and the low level of institutional support system for respondents that follow unsustainable farming practice. This aggravates the low status of assets owned by these households since land degradation adversely affects the crop yield obtained from the plot.

The economic theory of property rights applies the 'assurance', 'collateral' and 'efficiency or gains from trade' arguments to predict the effects of land tenure security on sustainable land management. In the context of the study area, where there is no property market, and the law prohibits the use of land as collateral, land titling may affect sustainable land management only through its assurance effect. Though most study respondents perceived their land tenure security to be high, poor agricultural production and environmental degradation were evident in the study *kebeles*. Based on these findings certain recommendations are made to promote sustainable farmland practices in Amhara region. The next chapter, therefore, concludes the thesis by providing a brief summary of the study, its conclusion and recommendations for future research and development.

CHAPTER EIGHT: SUMMARY, CONCLUSION AND RECOMMENDATIONS

8.1 Introduction

The purpose of this study was to analyse the impact of land registration and certification on the sustainable use of farmlands, with a view to contributing to the theoretical debate on tenure security and more realistic policy advocacy on the sustainable use of farmlands in contemporary Ethiopia. A large-scale rural land certification and registration scheme was launched in Ethiopia to enhance the perception of security of tenure among smallholders in order to improve agricultural production and sustainable land use. However, whether the land registration and certification scheme has had an impact on sustainable use of farmlands remains an important policy question. Since the land tenure system is characterized by state ownership of all rural and urban lands, which prohibits land selling and mortgaging, the effects of this scheme on sustainable farming practice are controversial. It is a sensitive political issue. The debate has been among professionals, academicians, opposition political groups and the government, while the perceptions of indigenous people and their understanding of the problem have seldom been taken into account. Besides, empirical studies on the impacts of the current land tenure system on sustainable farming practices are scant. Against this background, the study explored the perspectives of farmers as an important factor in shaping sustainable farming practices, for two reasons. First, addressing the issue of land tenure security alone might not be sufficient for sustainable land management and farming behaviour. Second, the issue of land tenure in the contemporary neoliberal globalization period requires broader understanding than in the past. This study intends to contribute to the literature on this issue by providing empirical micro-level evidence. It adopted a holistic approach, which followed an interactive process over time, using participatory data-gathering tools and techniques among study respondents from two rural *kebeles* of Amhara region as case studies.

The Amhara region is located in northwestern Ethiopia, where agricultural lands have experienced extensive cultivation for a long time in history; causing relatively high soil degradation. The Amhara land registration and certification programme started in 2003. By late 2005, 2.4 million households (79%) were registered, 1.3 million provisional certificates were issued free of charge and common property resources were demarcated (Deininger et al

2008:1793). A major feature of the programme is low-cost and decentralized implementation through elected land use and administration committees (LACs) at village level (see Deininger et al 2008; 2011). The programme promotes gender equality by issuing a land certificate that assures a joint land ownership of spouses. This land certificate details the rights and obligations of landholders. All these attempts aim primarily at increasing tenure security for augmented farm investment and sustainable land use, but do not provide farmers with rights to mortgage or sell the land. The research problem of this study was whether the current land registration and certification scheme promotes ecologically sustainable use of farmlands in Amhara region. Accordingly, the primary objective was to analyse the impact of the land registration and certification scheme on sustainable use of farmlands in Debre Mawi and Densa Bahta rural *kebeles* of the Amhara region. To achieve the primary objective, the following secondary objectives were set:

1. To provide a theoretical framework for the analysis of the relationship between security of tenure and sustainable use of farmlands by outlining sustainable development approaches, the economic theory of property rights and land tenure security from a sustainable development perspective
2. To explain the SLF and farming model from a sustainable point of view as an analytical framework for the study
3. To discuss the Ethiopian context with the focus on dominant farming system models, livelihood assets and livelihood strategies in rural Ethiopia
4. To provide a contextual analysis of dominant farming systems and rural livelihoods assets and strategies in the Amhara region and the case study sites (Debre Mawi and Densa Bahta *kebeles*)
5. To provide an explanation of the methodological approach applied in this study
6. To examine the views, knowledge, and attitude of farmers to the impact of land certification and registration on the ecologically sustainable use of farmlands in the case study sites
7. To investigate variables and factors that affect the sustainable use of farmlands in Amhara region by using a generic analytical framework
8. To recommend policy guidelines to promote ecologically sustainable use of farmlands in Amhara region

In sections that follow, a summary of the study is provided, followed by recommendations.

8.2 Summary

Chapter 2, which addresses the first secondary objective of the study, discussed the theoretical framework for the analysis of the relationship between security of tenure and sustainable use of farmlands by outlining sustainable development approaches, the economic theory of property rights and land tenure security from a sustainable development perspective. It examined the concept of 'sustainable development' as a goal that countries or communities strive to attain, and as a process that involves a balance between economic growth, social equity and environmental integrity. This is supplemented by an outline of the two approaches to sustainable development. On the one hand, the concept of weak sustainability, which is informed by mainstream economists, contends that sustained economic growth is a precondition for environmental conservation. On the other hand, the view of strong sustainability, which is informed by ecological scientists, contends that environmental protection is a precondition for economic growth. In addition, the chapter examined the relationship between land reform and sustainable development. The view of weak sustainability prescribes a suitable and stable property rights regime for sustainable land management practices. It is conventionally believed that land tenure security has investment enhancing and labour migration effects that help to reduce the presence of unsustainable land use practices.

Chapter 2 indicated how the concept of 'land tenure security' and 'sustainable use of farmlands' were measured in this thesis. Contemporary debates about sustainable land management were also discussed. Classical economists and neo-Malthusians hold a pessimistic view about the effects of population growth on land degradation. On the other hand, supporters of Boserup's thesis maintain an optimistic view. This model contends that population growth is a major determinant of technological change in agriculture, leading to innovation, improved land care, and induced intensification. The neoclassical model supports the theses of both Malthus and Boserup. The model thus suggests that public policies and development interventions can influence sustainable use of farmlands, depending on the dynamics of the local change process and the relative importance of key factors influencing sustainable farming practice.

Chapter 3 explained the sustainable livelihood framework (SLF) and farming systems model to provide the analytical framework for the study. The chapter addressed the second secondary objective set by the thesis by initially examining the SLF provided by DFID (2001). The SLF seeks to understand the relationships between the vulnerability context, livelihood assets, transforming structures and processes, livelihood strategies and livelihood outcomes. In addition, it examined the farming system model developed by Leeuwis and Van den Ban (2004). This model asserts that knowledge and perceptions are not neutral, but are subject to social influences and related to social interest. It presupposes that the learning processes of individual farmers are always changing with the dynamism of the social environment. It therefore examined the theoretical propositions of indigenous knowledge and social learning to show the determinants of farmers' decisions on conservation investment. Moreover, the chapter provided a generic analytical framework that helps to gain insight into pre-decisional processes and post-decisional processes of sustained use of conservation technologies. An analytical framework was developed by combining the SLF with the farming system model.

Chapter 4 addressed the third secondary objective, namely farming systems, livelihood assets and strategies in rural Ethiopia. This offered a macro-level scenario for Ethiopian farming systems and livelihood frameworks. In a subsistence-oriented Ethiopian farming system, agricultural production is used mainly for domestic consumption. In addition, farm households are characterized by both production and consumption units. The chapter emphasized that the behaviour of smallholders in managing their farmlands is determined by their principal means of livelihood, biophysical conditions, degree of integration between crop and livestock production systems, level of technology in crop production, types of crops, species of animals, customs and culture of people, settlement pattern, values and belief system, social status and stratification, political system and the policy environment. Chapter 4 revealed how farming systems differ, and examined the livelihood strategies that are being pursued in a given agro-ecology. The presentation of livelihood assets revealed that destitute and vulnerable households have insufficient amounts of capital, which impede them from establishing sustainable livelihoods. The income from non-agricultural ventures is used mainly to supplement household expenditure on food items, rather than regular investments that build the asset base. Rural financial institutions, which are meant to reach the poor in accordance with the policy statements, are unable to do so. Ownership of capital is crucial in defining a livelihood strategy and for opening opportunities for livelihood diversification. Effective policies that address the access of capital to the poor could reverse the land degradation caused by soil erosion.

Chapter 5 provided a contextual analysis of rural livelihoods in Amhara region and Yilmana Densa *woreda*, and the status of livelihood assets in the study villages, namely Debre Mawi and Densa Bahta rural *kebeles*. This offered meso- and micro-level scenarios to the research *kebeles* to provide a contextual appreciation of the findings. The chapter indicated that 90 per cent of farm households in both case study *kebeles* are engaged in subsistence farming. They derive their livelihoods from natural resource-based activities, both on- and off-farm. Their access to these resources is mediated by the outside world, which allocates the means of production and distribution of outputs. Chapter 5 underscored that the majority of rural households in Amhara region, which comprise 87 per cent of the region's population, derive their livelihood from natural resource-based activities, while the level of land degradation is high because of several factors. Farmland degradation because of soil erosion is caused by a combination of natural factors such as topography, erratic and erosive rainfall patterns, and human actions, including destruction of vegetation cover through deforestation, overgrazing, and inappropriate agricultural practices that are not in harmony with the environmental conditions of the region.

Chapter 6 provided an explanation of the methodological approach applied in this study. The chapter addressed the fifth secondary objective by highlighting the methodology employed in the study, as well as the philosophical perspectives that informed the choice of research methods. The research paradigm debate discussed in the chapter highlights the discourse on the supremacy of one research perspective over others, especially the 'quality of research or knowledge claims'. Ontologically the positivist position assumes 'naïve' or 'minimal realism' and the belief that only observable things are real and worthy of study. Epistemologically speaking, consistent positivists assert that any knowledge claim or scientific explanation must be arrived at through objective observation. The epistemological rhetoric of the critical research paradigm suggests that objective observation is impossible, and that all knowledge is generated or justified in the context of the researcher's framework and assumptions. There are thus similarities between critical theory and interpretivist and social constructionism research paradigms. All three include the epistemological notion that objective observation is not possible. However, interpretivism includes the additional notion that human experience is a process of interpretation of meanings and actions, that social reality is relative to the observer, and that everyday concepts need to be understood and interpreted to create specific knowledge about the social world. Another difference between critical and interpretivist research is the transformative nature of critical research, implying a focus on changing the status quo, whereas interpretivist research can be regarded as more ‘neutral’ and descriptive in this sense.

The choice of research method for this thesis was underpinned by a desire to acquire knowledge and understanding through interactive research that acknowledges the important role of the participant in the research process. The aim was to undertake an interactive process over time with local farmers and development practitioners unencumbered by what one had read in the literature. This suggests a qualitative research design underpinned by an interpretivist perspective. The overall approach was qualitative research in which a case study design was applied. Within the framework of qualitative research methodology, multiple sources of data were used to triangulate findings and enhance research rigour. Specific methods of data collection were FDGs, in-depth interviews and observation, complemented by context analyses of documents. Chapter 6 discussed a number of ethical issues that were addressed in the research process. Moreover, the limitations and strengths of the selected methodologies and some of the biases of the research in general were explained.

Chapter 7 indicated that continued access to and use of land for farming was important to the perceptions of most study respondents of security of land tenure in the Ethiopian context in which land is owned by the state. It was also observed that the issue of land ownership is divorced from the perception of security of land tenure among study respondents. The majority of interviewees (75%) think that the current land tenure system is favourable to them, while 25% believe that the system is unfavourable. Inability to acquire additional land, injustice in land distribution and the deficiency of the land tenure system in solving land shortage were common reasons mentioned by interviewees that expressed dissatisfaction with the current land tenure system. However, the land registration and certification scheme contributed to a high perception of security of land tenure among 94 per cent of interviewees.

Study respondents’ knowledge of and attitudes to security of land tenure and sustainable use of farmlands did not show variations across the two *kebeles* and three groups of farmers. Owing to the level of farmland degradation in their locality, farmers in the study *kebeles* are aware of the effects and manifestations of soil erosion. They have good knowledge of and favourable attitudes towards conservation technologies, which were almost identical across participants. The study results revealed the possible negative effects of inequitable land allocation on use of conservation technologies. The issue of land shortage and inequitable land distribution was echoed by a group of discussants from the low land management stratum and by the majority of interviewees that follow unsustainable farming practice. Thus, a high perception of security of tenure, coupled with adequate knowledge of and favourable attitudes to conservation technologies could not effectively result in sustainable farming among farmers with relatively lower productive assets, particularly the size of farmland. Group discussants from this stratum in both *kebeles* stated that the size of farmland is a major impediment to adoption of conservation technologies.

The most serious problems referred to by farmers that follow unsustainable farming practice were lack of finance and inadequate farmland. In addition, the study revealed how these farmers were at a disadvantage because of their lack of human, physical, natural, financial, social and cultural capital. This reinforced their low level of self-efficacy and their risk-averse behaviour towards adopting and using conservation technologies. The dynamism of this pre-decisional process for adoption of conservation technologies is represented in the analytical framework by double-headed arrows connecting ‘knowledge and attitude’, ‘productive asset holdings’, ‘risk perception and technology adoption’ and ‘self-efficacy’. These four sets of variables were regarded as major determinants of a particular farming practice at a certain point in time in the analytical framework. However, the relative importance of the last three sets of variables was found to be higher in the context of the study *kebeles,* since study respondents demonstrated uniform knowledge of and attitudes to land tenure security, land degradation and conservation technologies.

The study considered the adoption and continued practice of terrace construction, crop rotation, fallowing, tree planting, inter-cropping, and application of manure to farm plots as sustainable farming practice. Except for fallowing, interviewees in both *kebeles* showed improved adoption and continued use of other land management practices in the post-certification period. Group discussants gave several reasons for this change. These included i) technical knowledge and skill obtained from the agricultural extension service; ii) the green land certificate; iii) the campaign for watershed-based building of terraces, diversion ditches and check-dams; and iv) the ban on livestock grazing on crop residues in fields covered by terraces and check-dams. This shows the role of driving forces arising from the vulnerability context of land degradation, shocks, and transforming structures and processes such as the current land-use policy and institutional support mechanisms in mediating sustainable farming practice in the case study *kebeles*.

Post-decisional processes associated with driving forces would probably reinforce the pre-decisional processes to adopt conservation technologies among farm households that follow unsustainable farming practice. The process of impoverishment over time is exacerbated by the adverse effects of driving forces associated with vulnerability, natural calamities, and transforming structures and processes for those farm households that follow unsustainable farming practice. In addition, unsustainable farming practice aggravates the low status of productive assets owned by these households since land degradation determines the status of livelihood assets possessed by farm households for the next production period.

Providing security of tenure is often seen as a crucial factor for intensifying agricultural production, and is increasingly being stressed as a precondition for better natural resource management, sustainable development and reduced vulnerability to food insecurity. The current land registration and certification scheme is a source of controversy, since land tenure security is ascribed to state ownership of rural lands. However, the findings of this study reveal that the issue of land ownership is divorced from farmers' perceptions of security of land tenure. Though most farmers in Amhara region perceived their land tenure security to be high, poor agricultural production and land degradation were evident. The thesis, therefore, concludes that the failure of farmers' perceptions of security of land tenure to translate into better agricultural production and sustainable land-use practices implies the existence of other factors with negative consequences for agricultural production and sustainable use of farmlands.

8.3 Conclusion and recommendations

Land tenure security and sustainable use of farmlands

In rural areas of Africa, various land tenure regimes or property right systems govern access to and use of natural resources. Property rights in land can be categorized as state property; private property; communal property; and systems with unrestricted access to resources (EEA 2002; Feder & Feeny 1991; Heltberg 2002). Each of these categories has its own characteristics in terms of exclusiveness, inheritance, transferability and enforcement mechanisms. They constitute the rights and responsibilities of resource use and management by individuals or groups of people in a community (Feder & Feeny 1991).

Most farmers in sub-Saharan Africa hold their land under indigenous land tenure systems, which are often characterized by communal ownership of land resources, and the efficiency of these systems have been the concern of many scholars and development specialists. Since the colonial era, the property rights paradigm, grounded on neoclassical theory, has been used to argue that indigenous African land tenure systems are inefficient in allocation of resources and not consistent with the requirements of modern market economies. In view of this, land tenure reforms and their relationship with sustainable rural livelihoods and proper management of natural resources are currently the focus of policy debates. Current concerns with economic restructuring and moves towards a market economy in sub-Saharan African countries have brought fresh energy to the longstanding debate on the reform of indigenous or customary land tenure arrangements. Governments are under pressure to re-examine their land policies on sustainable rural livelihoods and the commercialization of agriculture, partly as a response to the requirements of donor countries and international lending institutions.

Historically, the dichotomy between socialist and liberal market orientations has influenced theories of land reform. In both ideological stands, land tenure reform is meant to be a strategy for economic development and a guide to facilitate the best economic use of land in a nation (Platteau 2000). The term ‘security of tenure’ is widely used in land tenure literature on economic development. Local farmers’ perceptions of security of tenure as a result of the various forms of property rights regimes have consequences for agricultural incentives, conservation investment and credit market transactions (Feder & Feeny 1991). They are also critical for rural households in their choice of livelihood activities and strategies. Mainstream economists believe that land registration and certification enhance the perception of security of tenure among smallholders. In addition, secure and easily transferable land rights are considered a precondition for intensifying agricultural production and are increasingly stressed as prerequisites for better natural resource management and sustainable development.

A major concern of scholars interested in African land tenure and agricultural development has been the lack of empirical evidence in support of the theoretical benefits of land tenure security accrued from a formally registered land title. This concern has given rise to quantitative studies based on survey research and econometric analysis by the grant obtained from the World Bank and the Land Tenure Centre (LTC) in most cases. The main objective of these studies was to analyse the extent to which expected outcomes of perception of land tenure security on farm productivity and land-related investment. Analysis of data was based on a theoretical model relating perception of land tenure security to farm productivity (Feder et al 1988), and a mathematical model used to analyse the investment-enhancing effects of security of land tenure (Besley 1995).

The land tenure reform debate in sub-Saharan Africa has focused on the merits of converting African indigenous tenure systems into formal systems through a process of land registration and certification (chapter 2). This is in keeping with the principles of the economic theory of property rights whose focus is on economic efficiency of land holding. Nevertheless, the theory of property rights cannot assess the adequacy of land tenure security on sustainable farming practice in African rural situations on economic considerations alone. It emphasizes market-driven property rights, and ensuring the security and efficiency of land transactions, but overlooks important socioeconomic factors that affect how rural productive resources are accessed, used, and contested by individuals or households in support of their livelihoods. In view of this, chapter 3 presented the SLF and farming system model to consolidate the theoretical and analytical foundation of this study.

The SLF stresses that the opportunities open to individuals and households are determined largely by their asset status (see section 3.2). This is in relation to land, physical assets, health, education, social networks, and financial capital (Ellis 2000). It thus sees farmers' motivations towards sustainable land management practices as the outcome not only of farmers' decisions at local level, but also of dynamic changes in vulnerability, status of livelihood assets, and changes in legislation and policy by national government. Likewise, the farming system model presented in the thesis articulates that an individual farmer makes a decision on sustainable land management practice by weighing up the complex relations and interconnections of technical and economic domains and of social-organizational relationships (see section 3.3).

The thesis shed light on the theoretical and methodological literature for these three reasons. First, the concept of land tenure security was measured in this thesis using a composite index rather than a dummy variable, which is often used in empirical works. Second, a generic analytical framework was used to look at the synergy of multiple variables that mediate an individual farmer's decision towards sustainable use and management of land resources in a given farming system. The analytical framework was developed by combining the sustainable livelihood framework with the farming system model. Third, the study goes beyond the effects of security of land tenure on a land-related investment, using an analytical framework that helps to obtain insight not only into pre-decisional processes but also into post-decisional processes of continued and sustained use of conservation technologies. Thus, adopting these methodological and theoretical considerations in both qualitative and quantitative research could help to improve one's understanding of the relationship between security of land tenure and sustainable use of farmlands.

Land tenure system and rural livelihoods in Ethiopia

Chapters 4 and 5 show that land is the basis of political economy and a key economic asset for most households in rural Ethiopia. Land and natural resource rights form the basis of livelihood activities of rural people, including subsistence farming, cash cropping and gathering of natural resources. In addition, given the lack of employment opportunities and social security, farmlands and communal grazing and forestlands are likely to remain important livelihood resources for rural households. Agriculture is still the mainstay of the Ethiopian economy, in which approximately 80% of the population are employed. It contributes about half of the GDP of the country and about 80% of foreign earnings. The government have given huge emphasis to the agricultural sector in the past two decades. Despite this, agriculture has not been able to feed the population and transfer the required capital to the industrial sector. Moreover, because of human-made and natural disasters, continuous natural resource degradation, fragmented landholding and rudimentary technology, agricultural production and productivity have been low. Non-farm activities could be considered a secondary source of cash income for households in rural Ethiopia (4.6.3) (Pender & Gebremedhin 2007). Wage or labour employments constituted 62 per cent of all reported non-farm employments, while the balance of 38 per cent was the share of self-employment (Gebreselassie 2009). Most of these non-farm activities are conducted in the village where farm households reside, while only 16 per cent of non-farm activities are located outside one's own village (EEA 2009). This means that the majority of non-farm employments could not provide an incentive to migrate or work outside one's own village or home. Both off-farm and non-farm activities are emerging as secondary sources of income in the case study *kebeles* (5.4.1 and 5.4.2*)*. It is thus important for government policy to recognize the diversity of rural people's livelihoods and the important role and contribution of farmlands to these livelihoods.

Land tenure reform oriented towards support of sustainable rural livelihoods is essential for rural Ethiopia. Informed and flexible land policy has an important role in shaping and strengthening tenure arrangements that move the society towards attaining the primary goals of equity, efficiency and sustainability. The search is for more effective policy interventions in establishing sustainable human institutions that assure security and opportunities for social, economic, environmental and political dimensions of sustainable development points to inclusiveness and diversity, rather than to universal blueprints. In Ethiopia, the land tenure system is characterized by state ownership of all land. Farmers in major regions of the country are now given provisional land possession certificates that ascertain that their farm plots belong to them and they have user rights over their holdings, except for transfer rights associated with land selling and mortgaging rights (see sections 1.4, 1.5, 4.2 and 5.2.2). The findings of this study indicated that the certificates have created a better sense of ownership than otherwise among Amhara farmers. But land certification has failed to address inequality in possession of farmlands among the village communities, which has an adverse effect on adoption of conservation technologies, thereby unsustainable use of farmlands. Inequitable distribution of land among the farming community might have an adverse implication for equity and efficiency aspects of resource use.

Land tenure reform by itself is not a complete solution to the production and livelihood problems of households in rural Ethiopia in general and in rural Amhara in particular. It is not the only constraint on the production systems and livelihood strategies of rural households. Evidence from this thesis has indicated that adoption and sustained use of conservation technologies by local farmers are not constrained by one variable, and therefore cannot be tackled by manipulating one key variable, but by dealing with several related variables (see section 7.7). The concept of livelihoods and the SLA emerged, which focus on people and their environment for present and future generations (section 3.2). This approach gave rise to the development of a framework that puts together the factors that affect peoples' livelihoods and the interrelationships between these factors. The major constituents of the framework are the vulnerability context under which people and assets exist; the five capital assets; the policies, institutions and processes that mediate between people and their access to assets; livelihood strategies that are natural resource based, non-natural resource based and migration; and livelihood outcomes such as increased production and income, increased wellbeing, reduced vulnerability, improved food security and sustainable use of the natural resource base.

Differential access to productive assets among farm households affects the costs, returns and risks of conservation investments, thereby sustainable use of farmlands (see section 7.7.3). Study respondents that follow unsustainable farming practice were relatively disadvantaged in possession of productive assets and demonstrated a low level of self-efficacy in solving the problem of land degradation in the study *kebeles*. The adoption of conservation technologies among those farmers that follow unsustainable farming practice was also jeopardized by their higher perception of risks, since terrace construction and tree planting compete for the small areas of farmland they possess. Moreover, the process of impoverishment or depletion of productive assets is exacerbated by natural calamities and low-level institutional support systems for respondents that follow unsustainable farming practices. These practices aggravate the low status of productive assets owned by these households since land degradation depletes the status of their principal means of livelihood.

Recommendations

In view of the research problem and research objectives of this study and consequent findings, recommendations are made that could be considered in future land tenure policies, land registration and certification schemes, and sustainable use of farmland in Amhara region.

1. Government intervention and land-use policy should be grounded on more rigorous and contextual study rather than ideological stands. Context-specific understanding of the dynamic interplay of several factors that resulted in an imbalance for the demand and supply of farmlands is thus vital in designing land-use policy and providing land certificates.

2. A holistic approach and comprehensive analytical framework are suggested to properly understand the synergy of the variables and factors that affect the sustainable use of farmlands across space and time.

3. The productive asset holdings of land-poor farmers and opportunities for off-farm activities should be enhanced, given the socio-political environment and context, and current land registration and certification scheme, which does not allow for equitable land redistribution. Off-farm activities are thus important mechanisms to raise the productive assets and incomes of households that follow unsustainable farming and to halt ongoing land degradation in Amhara region.

4. Government should create conditions that enhance smallholders other forms of productive assets. These measures could include investing in agrarian services (roads, extension, improved access to inputs, training, marketing outlets), access to affordable credit, community-based management of natural resources, literacy, education, and basic health services. Therefore, enhancing the productive asset of farm households is crucial to ensuring sustainable use of farmlands in Amhara region. Investment on conservation technologies can be improved by introducing and coordinating financial intermediaries that provide earmarked credit for land-related investment.

5. In light of 3 and 4 above, these recommendations that revolve around policies, institutions, and strategies are forwarded to halt land degradation in Amhara region through diversified livelihood opportunities.
   5.1 **Appropriate livelihood policies and analysis:** Policies should be designed and implemented that address the needs of the various livelihoods systems, as opposed to agricultural development packages based on agro-ecology. For this, local agencies should adopt a household livelihood analysis. This analysis should give particular emphasis to the promotion of non-farm and off-farm activities. Small towns and peri-urban centres should receive special attention, as they are dynamic economic forces in fostering rural-urban linkages and creating markets.

   5.2 **Increased interface of institutions with the clients:** The way in which policy reaches the clients is dependent on the nature of organizations and institutions and their modus operandi. The capacity of local institutions has to be developed and increased to implement agricultural and rural development policies and strategies in the country. The current displeasure of local farmers with public campaigns and the ban on grazing of crop residues show that the intentions of the policy are diluted in implementation. Moreover, the ability to establish active partnerships with and the participation of the community in the design of policies is instrumental for the success in implementation. Access to assets and utilization of services can be increased to a certain extent only by removing barriers to the dynamic engagement of the institutions with the community.

   5.3 **Strengthening access to capital and enhance claim making capacity:** In the absence of demand-driven and responsive planning of the government, it is instrumental to strengthen social capital and create local civil society organizations in order to enhance community awareness and claim-making capacity. This would help to improve access to capital assets because of the influences on the formulation and implementation of pro-poor policies. It would also help to establish strong community organizations that are foundations for ensuring sustainability in the use and management of farmlands and other natural resources. Indigenous networks should be regarded as potential coping strategies for mutual support of and aid to labour-poor farmers, instead of authoritarian campaigns and sanctions that aim to cover sub-watersheds with physical and biological conservation structures.

5.4 **Assisting existing livelihood strategies:** Policies and programmes should assist livelihoods wherever they arise. Thus non-natural resource activities based in the rural areas and non-farm activities outside one's own village should be given policy priority. To this end, proposed actions include providing labour market information, facilitating transport provision, strengthening group migration, providing numeric/literacy and skill training, and creating situations conducive to sustenance at the destination in consultation with the local administration.

5.5 **Increased responsiveness of lower level government institutions:** A response mechanism should be in place for improving policy formulation and implementation. The *woreda* administration should be able to make some key decisions or advocate on behalf of the poor when the policies are working against the poor. Credit policies with collateral requirements, higher prices of fertiliser (owing to trade liberalisation and removal of subsidies), and lower and fixed wage rates for the PSNP and livelihoods programme are typical examples. To this end, realistic devolvement and decentralisation of power to the *woreda* becomes imperative. There should also be a mechanism to receive policy feedbacks for a consistent update across *woredas*.

5.6 **Increased involvement of the private sector:** The role of the private sector is vital in many areas. One possible intervention is agricultural input supply, which would help increase farmers' access to inputs and services such as veterinary drugs, animal health services, vegetable seeds, and improved agricultural implements. At present, the role of the private sector in the provision of these services to enhance the productive assets of farm households was found scanty in the case study *kebeles*. The same is true of Yilmana Densa *woreda* and Amhara region. Thus, proper policies should be designed and implemented to enhance the productive assets of farm households through increased involvement of the private sector.

The context of this study should be seen as the emerging discourse of careful empirical investigation in examining the links between land rights, conservation investment and sustainable land use. A generic analytical framework that combines the sustainable livelihood framework and the faming system model was used to observe and understand the synergy of five sets of variables that affect the ecologically sustainable use of farmlands in the case study area. The thesis indicated that there is synergy between 'driving forces' of the external environment, 'knowledge and attitude', 'productive asset holdings', 'risk perception and technology adoption' and 'self-efficacy' of farmers to adopt sustainable farming practice, thereby an improved management and sustainable use of farmlands. However, the relative importance of 'productive asset holdings', 'risk perception and technology adoption' and 'self-efficacy' were higher in the context of the study *kebeles* since study respondents demonstrated uniform knowledge of and attitudes to land tenure security, land degradation and conservation technologies.

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ANNEXES

Annex I: Topic Guide for Focus Group Discussion

Introduction: Brief the Group about:

- Ethical issues and objectives of the study
- Do not need to come consensus or agreement, everyone's views are valued,
- Unless participants are unanimously willing, there will not be any kind of note taking and audio recording,
- Each participant has a role and responsibility to preserve privacy and confidentiality as much as possible. Disseminating someone's ideals within the village in the form of either joke or gossip is a punishable act under the law.

A. WARM UP

Warm up the participants with the use of posters. Then**,** start the discussion with introductory session. Allow the participants to undertake an introductory session that includes introducing their name along with descriptions associated to.

- Type and amount (quantity) of conservation investment[116] made on their plots
- Their future plan or inclination towards undertaking conservation investments

B. SPECIFIC QUESTIONS

1. Is the existing land tenure system any different from the system that prevailed during the Derg? If so, what are the differences and/or similarities among them?
2. Please, list down the types of land rights bestowed to you by land registration and certification scheme.
3. Do you think that there is soil degradation in the arable lands of your locality? If yes, what are the major causes and manifestations?
4. How would you recognize a sustainable and unsustainable farmland from its appearance?
5. What economic, social and cultural advantages are experienced by farmers undertaking sustainable land management practices?
6. What types of soil and water conservation technologies (both traditional and modern) were used a decade ago in your locality for the purpose of sustainable management of farmlands?
7. What types of traditional and modern conservation technologies are currently common for the purpose of sustainable management of farmlands in your locality?
8. What are the reasons for observed patterns of change among current and earlier sustainable farming practices through the adoption and disadoption of conservation technologies in your locality? (Optional question, if different answers (lists) are provided to question numbers 6 and 7).
9. How does land certification and registration scheme affect sustainable farming practice in your locality?

[116] These conservation investments include both traditional and modern technologies. The traditional measures include drainage furrows and the modern methods includes graded soil bunds, stone faced terraces, check-dams and cut-off drain structures.

Annex II: Questionnaire for the Interview of Individual farmers

Greet the person you are interviewing, and introduce yourself. Then, read aloud this:

Dear Sir/Madam,
This questionnaire is designed to collect information about the impact of introducing land certificate on sustainable use of farmlands in your locality. This information will be used only for academic purpose and confidential. In addition, you are free to abstain to a question that demands a response beyond your personal perception. Thus, you are highly requested to provide your genuine response. Thank you in advance.

Name of enumerator ___________ Date of interview ______ Signature _______

1. **Respondents back ground information**
   Kebele_____________________ 'Got'(Village)_______________
   Land management Strata (filled by the enumerator) _____________

2. How many family members do you have? ____________.
3. Could you please tell me the peculiar characteristics of your household members?

Household member	Sex		Age	Level of education (See code)	Occupation (see code)	
	Male	Female			Main	Secondary
Family head						
Spouse						
Children (a)						
Children (b)						
Children(c)						
Children (d)						
Children(e)						
Other house hold members(a)						
members(b)						
members(c)						
members(d)						

Codes for education level and occupation

Level of education	**code**	**Type of Occupation**	**Code**
Illiterate	1	Farming	1
Read and write	2	Petty trade	2
Grade 1-4	3	Hand craft and construction	3
Grade 5-8	4	Metal and woodwork	4
Grade 9-12	5	Non-farm wage employment	5
12^{+}	6	Others, specify	6
Collage/university	7		
Other, specify	8		

4. Could you please tell me the observed patterns of change in characteristics of your household members in the pre and post land certification periods?

	Currently	pre-certification
Family size	………………..	………………..
Number of male adult members	…………………	……………………
Number of female adult members	……………..	…………………..
Maximum education of household head	……………..	……………….
Maximum education of household member	…………………	………………….

5. What was the total farmland size of the household before land registration and certification? ____________ Quada[117].

6. What is the total farmland size of the household for which land certificate is provided? _______________Quada.

7. Do you have enough land for producing enough food crops for your household consumption? 1 = yes, 0 = no

8. Which of the following statements explain land tenure security to you?

		Yes (1)	No (0)
8.1	Is land tenure security having a right to continually cultivate the land without outside interference?		
8.2	Is land tenure security having a right to reap benefits of capital and labour invested in land?		
8.3	Is land tenure security having a right to benefit from the land temporarily transferred to others?		
8.4	Is land tenure security having a right to benefit from the land permanently transferred to others?		

9. What do you think of the following statements?

		Agree a lot (5)	Agree a little (4)	No opinion (3)	Disagree a little (2)	Disagree a lot (1)
9.1	Land certification guaranteed secure, equal and enforceable land rights to both rich and poor farmers.					
9.2	I am certain that the use rights given to me on arable lands will remain with me and my family for the coming five years.					
9.3	Adequate compensations will be given for the visible investments I made in my holdings if there is future land redistribution.					
9.4	Land certification ameliorated land litigation among relatives and neighbours.					
9.5	Land certification guaranteed secure, equal and enforceable land rights to both men and women farmers.					
9.6	Land certification guarantees secure and enforceable formal land market transactions.					

10. Do you think that the current land tenure system is a constraint to improved agricultural production and productivity in your locality? 1 = yes, 0 = no

[117] *Quada* is the local measuring unit for farm lands; four *quada* are equivalent to one hectare.

11. Do you believe that the current land tenure system is a constraint to improved and sustainable natural resource use and management? 1 = yes, 0 = no

12. Suppose land is to be privatized and you can do whatever you want with your land, do you believe that your land management practice will be changed?
1 = yes, 0 = no (If No, go to question number 14)

13. If yes, in what way? (please ,explain)

____
____
____
____
___

14. Do you think the current land holding system is good for you?
1 = yes, 0 = no (If No, go to question 16)

15. If yes, in what way, if you have more than one reason, please number the reason in order of priority.

- [ ] You can acquire land easily
- [ ] More secure than before
- [ ] Have no problem of boarder conflict
- [ ] Fair distribution of land
- [ ] Other reason, specify ______________

16. If no, which could be the reason, if you have more than one reason, please number the reason in order of priority.

- [ ] Fear of losing land, tenure insecurity
- [ ] Problem with local authority
- [ ] Not being able to sell and buy
- [ ] Injustice in land distribution
- [ ] Not being able to get extra land
- [ ] Could not solve land shortage
- [ ] Other reason, specify ______________

17. What type of house did you have before land certification? 1= corrugated iron 0 = grass-roofed

18. What type of house did you have currently? 1= corrugated iron 0 = grass-roofed

19. Did you lend at least Birr 50 to any one during the last 5 years? 1= yes 0 = no

20. Did you adopt any non-farm own business before you received land certificate? 1 = yes 0 = no (If No, go to question number 22).

21. If the answer for question 20 is yes, which activity you adopted among the following lists?

	Yes	No
Agro-processing	1	0
Petty trade	1	0
Metal and woodwork	1	0
Handicraft and construction	1	0
Non-farm wage employment	1	0

22. Could you please tell me the number of livestock your household owned in the pre and post land certification periods?

	Ox	Bull	cow	Heifer	Calve	Sheep	Goat	Donkey	Mule	Horse	Poultry
Currently											
Before land certificate											

23. Do you have credit access? 1 = yes, 0 = no (If No, go to question number 29)

24. If yes, give details about it for the pre and post certification periods (multiple answers are possible for source, purpose, mortgaged asset).

Period	Source (see code)	Purpose of credit	Amount (in Birr)	Kind of asset mortgaged	Interest rate (%)
After land certificate					
Before land certificate					

Code for source of credit

Source of credit	Code	Source of credit	Code
State (public) bank	1	NGO's	7
Private bank	2	Agricultural extension package	8
Local/village money lender	3	Amhara credit and saving association	9
Friends/Relatives	4	Orthodox Church	10
Equub[118]	5	Others , Specify	11
Idir[119]	6		

25. Do you think that the amount of credit that you obtained is enough to sustainable farming? 1 = yes, 0 = no

26. Do you feel that the credit facilities are adequate? 1 = yes, 0 = no

27. If no, explain why?

____
____
____
____
____

[118] community or local saving association
[119] community self help association

28. Please can you tell me the source of credit, precondition and major problems associated with the credit facilities?

No.	Source of credit (see the code below)	Length of Credit Contract (State in Number of years)	Precondition	Major problem
1				
2				
3				
4				
5				
6				

Source of credit	Code	Source of credit	Code
State (public) bank	1	NGO's	7
Private bank	2	Agricultural extension package	8
Local/village money lender	3	Amhara credit and saving association	9
Friends/Relatives	4	Orthodox Church	10
Ikub[120]	5	Others , Specify	11
Idir[121]	6		

29. What are the natural resource degradation problems in your locality?

- ☐ Low and erratic rainfall
- ☐ Reduced vegetation
- ☐ Drying up of rivers
- ☐ Soil degradation
- ☐ Loss of wildlife
- ☐ Bush burning
- ☐ Overgrazing
- ☐ Other reason, specify _____________

30. Have environmental conditions in your community improved or worsen in the last five years?

	Environmental Condition	Improved a lot (5)	Improved a little (4)	Same (3)	worsened a little (2)	Worsened a lot (1)
30.1	Soil resource degradation					
30.2	Water resource degradation					
30.3	Plant resource degradation					
30.4	Animal resource degradation					
30.5	Overall environmental degradation					

[120] community or local saving association
[121] community self help association

31. Please tell me the types of sustainable land management practice that you made on your holdings before and after receiving land certificate? (put the answer by using **X** mark).

Period	**Land management practice**					
	Building terraces	**Crop rotation**	**Fallowing**	**Planting tree**	**Intercropping (mixed cropping)**	**Application of Manure**
Before land certificat e						
After land certificat e						

32. Please tell me the number of trees and where you have planted them on your land?

code	**Type(name) of tree**	**Number of trees planted**		**Age of the oldest Tree**
		homestead	**Other plots**	
1	**Eucalyptus species**			
2				
3				
4				
5	**Other, specify**			

33. Have you encountered a reason that jeopardized your sustainable land management practices in the last two years? 1= yes 0 = No (If No, go to question number 35)

34. If Yes, please tell me the reasons that jeopardized your sustainable land management practices in the last two years. If you have more than one reason please rank the reasons in their order priority.

Possible Reason	**Land management practices**					
	Building terraces	Crop rotation	Fallowing	Planting tree	Intercropp ing(mixed cropping)	Application of Manure
Didn't have enough land						
Not common around here						
Did not have time to do so						
Bad for the crop						
Have no idea at all						
Lack of credit access						
Not sure about the future(tenure insecurity)						
Financial incapability						
Fertility of soil						
Slope of the plot						
Far away from my dwelling						
Far away from input market						
Far away from output market						
Others (specify)						

35. Please can you tell me the main reasons (purpose) why you undertake the under listed land management practices? If you have more than one reason, please number the reason in order of priority**.**

Possible Reason	**Land management practices**					
	Building terraces	Crop rotation	Fallowing	Planting tree	Intercropping (mixed cropping)	Application of Manure
To enhance the productivity of land						
For cultural reason						
For sale						
To fulfill the requirements from local administration						
To enhance tenure security						
Others(specify)						

36. Do you have any plan to undertake any of the above long term land management practices in the coming five years? 1 = yes, 0 = no (If no, go to question number 38)

37. If yes, list down the types of land management practices planed?

____
____
____
____
____

38. If no, explain the reason why?

____
____
____
____

39. What do you think of the following statements

		Agree a lot	Agree a little	No opinion	Disagree a little	Disagree a lot
39.1	Soil erosion reduces agricultural output	5	4	3	2	1
39.2	Soil fertility increases agricultural output	5	4	3	2	1
39.3	Gullies and rills are manifestations of soil erosion	5	4	3	2	1
39.4	Conservation technologies helps to reduce soil erosion	5	4	3	2	1
39.5	Adoption of conservation technologies helps to increase agricultural output	5	4	3	2	1
39.6	Constructing conservation technologies is a responsibility of GOs and NGOs	1	2	3	4	5
39.7	A farmer has an obligation to construct conservation structures	5	4	3	2	1
39.8	Farmers should be paid for construction of terraces	1	2	3	4	5
39.9	Conservation structures have adverse effect on agricultural output	1	2	3	4	5
39.10	Constructing conservation structures have adverse effect on household income	1	2	3	4	5
39.11	Existing agricultural practices lead to environmental degradation	5	4	3	2	1

40. Do you think that you can easily mobilize the local economy resources to balance your deficit for adoption of conservation technologies? 1 = yes, 0 = no (If Yes, go to question number 42)

41. If no, what sort of challenges you anticipate in this regard?
____
____
____
____
____

42. Do you believe that your household is endowed with the required skills and competency to adopt conservation technologies? 1 = yes, 0 = no (If No, go to question number 44)

43. If yes, to which types of technologies?
____
____
____

44. If no, to which types of technologies?
____
____
____

45. Have you or any member of your household received food aid in the last 15 years? 1 = yes, 0 = no If yes, how many times and in which years? _____________
____
____
____

46. Were you included in the current extension program? 1 = yes, 0 = no
If yes, what sort of advice is available and how effective are these advices?

No	Type of advices	Extent of Effectiveness				
		Very good (5)	Good (4)	Not Good (3)	Bad (2)	Very bad (1)

47. What is the distance between your home and the two closest markets you frequently use for marketing your output/inputs?

Markets	Name of the Market	Distance in local units (hrs on foots….)
The closest market		
The next closest market		

48. What are the most serious agricultural problems of farmers in your community? (Multiple answer is possible but rank them according to their order of importance)

- [ ] Lack of Finance
- [ ] Poor soil quality
- [ ] Pests and diseases
- [ ] Inadequate farm land
- [ ] Lack of labour
- [ ] Lack of market
- [ ] Tenure insecurity
- [ ] Other reason, specify ______________

49. Do you experience any catastrophic shock before you received land certificate? 1 = yes, 0 = no

50. What shock has your household experienced in the last 6 years and what impact did this shock have?

Shock	Yes no		Loss of assets due to shock	
			Yes	no
Any shock	1	0	1	0
Weather	1	0	1	0
Pest and diseases	1	0	1	0
Illness and death of family member	1	0	1	0
Loss of livestock	1	0	1	0

51. What is/are the main source(s) of energy for cooking in your household?
____
____
____

52. Could you please, tell me your last year annual expenditure on the following items?

Code	Expenditure Category	Amount in Birr
1	Agriculture Related	
2	Household food consumption	
3	Household school expenses	
4	Household health expenses	
5	Household clothing expenses	
6	Household expenses in social events	
7	Household tax payments	
8	Household Other expenses (specify)	

53. Could you please, tell me the status of your and any household members participation or affiliation with the following institutions?

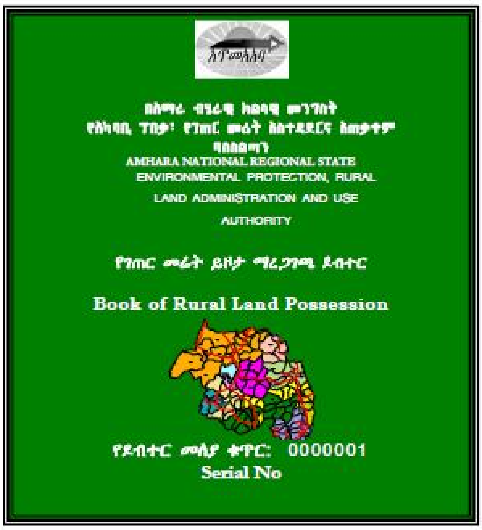
Code	Institution	Yes (1)	No (0)
1	Kebele council		
2	*Equb*		
3	*Idir*		
4	*Mahiber*		
5	*Senbete*		
6	Cooperative		
7	Political party		
8	Other institutions (specify)		

54. Do you have any suggestions, comment or advise you would like to make on the current land tenure system?

____
____
____
____

Thank you for your co-operation in providing the required Information

Annex III: Details of the Amhara Land Certificate



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1. **<u>የባለይዞታው(ዋ) ሙሉ ስምና አድራሻ</u>**

1.1 የባለይዞታው(ዋ)<u>ሙሉ ስም</u> <u>ፆታ</u> <u>የትውልድ ዘመን</u>

ሀ. ______________ ______ ______________

ለ. ______________ ______ ______________

1.2 የምግዚቱ(ቷ) <u>ሙሉ ስም</u> <u>ፆታ</u> <u>የትውልድ ዘመን</u>

______________ ______ ______________

1.3 የትዳር ጓደኛ <u>ሙሉ ስም</u> <u>ፆታ</u> <u>የትውልድ ዘመን</u>

ሀ. ______________ ______ ______________

ለ. ______________ ______ ______________

1.4 የቤተሰብ አባላት/በሞግዚት የሚወርሱ ህጻናት ስም ዝርዝር

<u>ሙሉ ስም</u> <u>ፆታ</u> <u>የትውልድ ዘመን</u> <u>ዝምድና</u> <u>መግለጫ</u>

ሀ. ______________ ______ ______________ ______________ ______________

ለ. ______________ ______ ______________ ______________ ______________

ሐ. ______________ ______ ______________ ______________ ______________

መ. ______________ ______ ______________ ______________ ______________

ሠ. ______________ ______ ______________ ______________ ______________

ረ. ______________ ______ ______________ ______________ ______________

ሰ. ______________ ______ ______________ ______________ ______________

ሸ. ______________ ______ ______________ ______________ ______________

ቀ. ______________ ______ ______________ ______________ ______________

በ. ______________ ______ ______________ ______________ ______________

1.5 የባለይዞታው(ዋ) ቋሚ አድራሻ

ክልል______________ ዞን______________ ወረዳ ______________ ቀበሌ ______________ ን/ቀበሌ ______________ ጎጥ ______________ መግለጫ______________

2. የይዞታው መለያ ቁጥር ______________

<u>ማሳሰቢያ</u>

- የገጠር መሬት ባለይዞታዎች የይዞታቸው መከበርና በመሬታቸው የመጠቀም ዘላቂ መብታቸው በሕግ የተጠበቀ መሆኑን ለማረጋገጥ የአካባቢ ጥበቃ፣ የገጠር መሬት አስተዳደርና አጠቃቀም ባለስልጣን በህግ በተሰጠው ስልጣን መሰረት ይህን የመሬት ይዞታ ማረጋገጫ ደብተር ለባለይዞታው እንዲሰጥ ተወስኗል።
- ይህ ደብተር 20 የውስጥ ገጾች ያሉት ህጋዊ ሰነድ ነው።
- ይህ የመሬት ይዞታ ማረጋገጫ የተሰጠው(ጣት) ሰው የመሬቱ ትክክለኛ ባለይዞታ ተደርጎ(ጋ) ይወሰዳል።

- የባለይዞታው(ዋ)ን መሬት የሚያሳይ ካርታ ከተዘጋጀ ለባለይዞታው(ዋ) የሚሰጠው በተራ ቁጥር 7 ላይ የተመለከተው ሁለተኛ ደረጃ የይዞታ ማረጋገጫ ሠነድ ተሞልቶ ከካርታው ይሆናል፡፡
- በደብተሩ ላይ የተጠቀሱት መብትና ግዴታዎች የመጀመሪያ ደረጃም ሆነ ሁለተኛ ደረጃ የይዞታ ማረጋገጫ ደብተር ለተሰጣቸው የመሬት ባለይዞታዎች እኩል ተፈጻሚ ይሆናሉ፡፡
- መሬትን በከፍተኛ ደረጃ ለሚንከባከቡና ምሳሌ የሚሆን የልማት ሥራ ለሚያከናውኑ የመሬት ተጠቃሚዎች የባለስልጣኑ መ/ቤት አቅሙ በፈቀደ መጠን የማበረታቻ ሽልማት ይሰጣል፡፡
- የመሬት ተጠቃሚዎች መሬታቸውን ኩታገጠም ለማድረግ መሬት ሲለዋወጡ የይዞታ ማረጋገጫ ደብተራቸው ያለምንም ክፍያ በነጻ ይታደስላቸዋል፡፡
- ይህ የመሬት ይዞታ ማረጋገጫ ደብተር የሚመለከታቸው ኃላፊዎች ፊርማና ለዚህ ጉዳይ የተቋቋመው የወረዳው ዴስክ/ጽ/ቤት ማህተም ካላረፈበት ህጋዊ ተቀባይነት አይኖረውም፡፡

3. <u>የባለይዞታው(ዋ) መብቶች</u>

3.1. ይህ የመሬት ይዞታ ማረጋገጫ ደብተር በስሙ(ሟ) የተሰጠው በደብተሩ ተራ ቁጥር 6.2/7.1 የተጠቀሰውን መሬት በአግባቡ ይዞ(ዛ) እስከተጠቀመ(ች) ድረስ የመጠቀም መብቱ(ቷ)ን እና ይዞታው(ዋ)ን ያለማጣት ዋስትና በህግ ተረጋግጦለ(ላ)ታል፡፡

3.2. ባለይዞታው(ዋ) በመሬቱ(ቷ) ላይ ንብረት የማፍራት ህገመንግስታዊ መብቱ(ቷ) የተረጋገጠ ነው፡፡ በመሆኑም መሬቱ ለህዝብ አገልግሎት እንዲውል በህግ በተደነገገው መሰረት ካልተወሰነ በስተቀር መሬቱን የመጠቀም መብቱ(ቷ) በማንም አይደፈርም፡፡

3.3. ባለይዞታው(ዋ) መሬቱ ለአጠቃላይ የአካባቢ ልማት እንዲውል በህጉ መሰረት ከተወሰደበ(ባ)ት አግባብ በሆነ ጊዜ ሁሉ ትክ መሬት የማግኘትና በይዞታው(ዋ) ላይ ላፈራቸ(ች)ው ንብረቶች በቅድሚያ ተመጣጣኝ የሆነ ካሳ የማግኘት መብት አለው(ላት)፡፡

3.4. ባለይዞታው(ዋ) በህግ በተደነገገው መሰረት የይዞታ መሬቱ(ቷ)ን የማከራየት እና የማውረስ መብቱ(ቷ) በህግ የተጠበቀ ነው፡፡

3.5. ባለይዞታው(ዋ) በይዞታ መሬቱ ላይ ያለማ(ች)ውን ንብረት በማስያዝ ገንዘብ የመበደር መብት አለው(ላት)፡፡

3.6. ባለይዞታው(ዋ) በይዞታ በተሰጠው(ጣት) መሬት የመጠቀም መብቱ(ቷ)ን በራሱ(ሷ) ፈቃድ በማንኛውም ጊዜ መተው ይችላል/ትችላለች፡፡ የመጠቀም መብቱ(ቷ)ን በሚያቋርጥበት/በምታቋርጥበት ጊዜ በመሬቱ ላይ ያፈራቸ(ች)ውን ንብረቶች የማንሳት መብቱ(ቷ) በህግ የተጠበቀ ነው፡፡

3.7. ባለይዞታው(ዋ) መሬቱ(ቷ)ን ለመንከባከብና በአግባቡ ለመጠቀም ያለበ(ባ)ትን ኃላፊነት ለመወጣት ከሚመለከተው መስርያ ቤት የሙያ ድጋፍ የማግኘት መብት አለው(ላት)፡፡

3.8. በመስኖ አውታር ግንባታ ምክንያት መሬቱ(ቷ)ን ያጣ(ች) ባለይዞታ ካጣው(ችው) ይዞታ ተመጣጣኝ የሆነ ስፋት ተቀምሮ በመስኖ የሚለማ አዲስ የይዞታ መሬት መጠን የማግኘትና በተገነባው የመስኖ ውሃ የመጠቀም መብት አለው(ላት)፡፡

3.9. ባለይዞታው(ዋ) ከዋና እና ከመጋቢ የመኪና መንገድ ጋር በሚዋሰኑ ይዞታዎቹ(ቿ) በመንገድ ዳር በግል የተከላቸውን/የተከለቻቸውን ዛፎች ለጥቅም ሲደርሱ በመቁረጥ የሚያቆጠቁጡ ከሆነ በመንከባከብ፣ የማያቆጠቁጡ ከሆነ ደግሞ በአዲስ ተክላ ተክቶ(ታ) የመጠቀም መብት አለው(ላት)፡፡

3.10. ባለይዞታው(ዋ) በሚ(ም)ኖርበት ቀበሌ ውስጥ የሚገኙትን የወል መሬቶች በጋራ የማልማትና የመጠቀም መብት አለው(ላት)፡፡

3.11. ባለይዞታው(ዋ) በራሱ(ሷ) መሬት በኩል መግቢያና መውጫ ከሌለው(ከሌላት) የሌሎችን ይዞታ ድንበር በመጠቀም ለስራው የሚ(ም)ጠቀምባቸውን እንስሳት ይዞ(ዛ) ወደ ይዞታው(ዋ) የመግባትና ወደ ዋና መንገድ የመውጣት መብት አለው(ላት)፡፡

4 <u>የባለይዞታው (ዋ) ኃላፊነቶች</u>

4.1. ባለይዞታው(ዋ) በይዞታው(ዋ) ስር ያለውን መሬት የመንከባከብና በአግባቡ የመያዝ ኃላፊነት አለበ(ባ)ት፡፡

4.2. ባለይዞታው(ዋ) በይዞታው(ዋ) ላይ ስለሚለሙ ንብረቶች ከባለሞያዎች ጋር በመሆን የማቀድና በተፈጥሮ አካባቢ ላይ የሚደርስን ጉዳት ሚና የመቀነስ ኃላፊነት አለበ(ባ)ት፡፡

4.3. ባለይዞታው(ዋ) በይዞታው(ዋ) ላይ የሚያለማው (የም)ታለማው) ንብረት በአጎራባች መሬቶች ላይ ጉዳት የማያደርስ መሆኑን የማረጋገጥ ኃላፊነት አለበ(ባ)ት፡፡

4.4. ባለይዞታው(ዋ) በዝናብ ወቅት በማሳው(ዋ) ላይ የሚፋሰሰውን ውሃ የማቆር እና ከራሱ(ሷ)ም ሆነ ከሌሎች ማሳዎች የሚፋሰሰውን ትርፍ ውሃ ጉዳት ሳያደርስ ተቀባብሎ የማፋሰስ ስራ የመስራት ኃላፊነት አለበ(ባ)ት፡፡

4.5. ባለይዞታው(ዋ) በይዞታው(ዋ) ስር የሚገኘው መሬት ለአጠቃላይ የአካባቢ ልማት መዋል እንደሚገባው በጥናት ሲታመንበትና ሲወሰን ተገቢውን ማካካሻ በቅድሚያ ተቀብሎ(ላ) ይዞታው(ዋ)ን የመልቀቅ ግዴታ አለበ(ባ)ት፡፡

4.6. ባለይዞታው(ዋ) የመስኖ ቦዮች እና ሌሎች የመሰረተልማት አውታሮችን ለመዘርጋት የሚያስፈልግ መስመር በባለይዞታው(ዋ) መሬት ላይ የሚተላለፍ ከሆነ በመሬቱ(ቷ) ላይ እንዲያልፍ የመፍቀድ ግዴታ አለበ(ባ)ት፡፡

4.7. ባለይዞታው(ዋ) በይዞታው(ዋ) ስር ያለው መሬት ውሃገብ ሆኖ በሚገኝበት የመስኖ አውታሮች ተጠቃሚ የሚሆን (የምትሆን) ከሆነ(ች) ለሌላው(ዋ) በመስኖ አውታር ግንባታ ምክንያት መሬቱ(ቷ)ን ሳጣ(ች) ተጠቃሚ የውሃገብ መሬት አካፍሎ የመስጠት ግዴታ አለበ(ባ)ት፡፡

4.8. ባለይዞታው(ዋ) በይዞታው(ዋ) ስር ያሉ የእርሻ መሬቶች ወንዝና አፈረገደሎችን የሚያዋስኑ ከሆነ በሚመለከተው አካል በሚወሰን ርቀት ከአፈረገደሉ እርቆ(ቃ) ማረስ ይኖርበ(ባ)ታል፡፡ በተጨማሪም የወንዞችና አፈረገደሎችን ድንበር በይዞታው(ዋ) ስር አድርጎ(ጋ) በእጽዋት መሸፈንና እየተጠቀመ(ች) የመንከባከብ ኃላፊነትአለበ(ባ)ት፡፡

4.9. ባለይዞታው(ዋ) ይዞታው(ዋ) ከዋና ወይም ከመጋቢ የመኪና መንገድ ጋር የሚዋሰን ከሆነ በመንገድ ዳር ዛፍ የመትከልና እየተጠቀመ(ች) የመንከባከብ ኃላፊነት አለበ(ባ)ት፡፡

4.10. ባለይዞታው(ዋ) የወል መሬቶችን ለመንከባከብ በሚወጣው የአካባቢ ባህላዊ ደንብ መሰረት የሚጠበቅበ(ባ)ትን አስተዋጽኦ የማበርከት ግዴታ አለበ(ባ)ት፡፡

4.11. ባለይዞታው(ዋ) በይዞታው(ዋ) ላይ የቅየሳ ስራ ሲካሄድና የድንበር ምልክቶች ሲደረጉ የመተባበር ግዴታ አለበ(ባ)ት፡፡

4.12. ባለይዞታው(ዋ) በይዞታው(ዋ) ስር የሚጠለሉ የዱር እንስሳት ጉዳት የማያደርሱ እስከሆነ ድረስ ጉዳት እንዳይደርስባቸው ጥረት የማድረግ ኃላፊነት አለበ(ባ)ት፡፡

4.13. ባለይዞታው(ዋ) በይዞታው(ዋ) ላይ አደገኛ እጾችን መትከልና ማልማት አይችልም(አትችልም)፡፡

4.14. ባለይዞታው(ዋ) ለመሬት አስተዳደርና መሰል ጥናቶች መሬት ነክ መረጃ እንዲሰጥ/እንድትሰጥ አግባብ ባለው አካል ሲጠየቅ/ስትጠየቅ የመስጠት ግዴታ አለበ(ባ)ት፡፡

4.15. ባለይዞታው(ዋ) የተሰጠውን/የተሰጣትን የይዞታ ማረጋገጫ ደብተር በጥንቃቄ የመያዝና በሚመለከተው አካል በተጠየቀ ጊዜ የማሳየት ግዴታ አለበ(ባ)ት፡፡

5 <u>ኃላፊነትን አለማክበር</u>

5.1. ማንኛውም የመሬት ተጠቃሚ በራሱ(ሷ) ድክመት መሬቱ(ቷ)ን ሳይንከባከብ(ሳትንከባከብ) ቀርቶ(ታ) በመሬቱ ላይ ጉዳት ከደረሰ አዋጅ ቁጥር 46/92ን ለማስፈጸም በወጣው ደንብ መሰረት ሊቀጣ(ልትቀጣ) ይችላል(ትችላለች)፡፡

5.2. ማንኛውም የመሬት ተጠቃሚ የወል መሬትን ለመንከባከብ አልተባበርም ካለ(ች) በደንቡ መሰረት ሊቀጣ(ልትቀጣ) ይችላል(ትችላለች)፡፡

5.3. ማንኛውም የመሬት ተጠቃሚ ኃላፊነቱ(ቷ)ን ባለመወጣት በሌሎች ሰዎች ይዞታ ላይ ጉዳት እንዲደርስ ካደረገ(ች) በደንብ መተላለፍ ከሚቀጣው(ከምትቀጣው) በተጨማሪ በፍታብሔር ሕግ መሰረት የጉዳት ካሳ እንዲከፍል (እንድትከፍል) ሊወሰንበት(ሊወሰንባት) ይችላል፡፡

5.4. ማንኛውም የመሬት ተጠቃሚ የቅየሳ ስራ ሲካሄድ ከከለከለ(ች)፡የድንበር ምልክት ሲደረግ ካልተባበረ(ች)፡ ጎጂ ባልሆኑ የዱር እንስሳት ላይ ጉዳት ካደረሰ(ች) እና ሌሎች የመሬት ተጠቃሚዎችን በድንበር እንዳይተላለፉ ከከለከለ(ች) በደንብ መተላለፍ ሕግ ይቀጣል (ትቀጣለች)፡፡

እንዳይረሱ!

- እርስዎንና ቤተሰቦዎን ከቀሳፊው የኤች.አይ.ቪ/ኤድስ በሽታ ይጠብቁ፡፡
- ይህ ደብተር ከጠፋ ወይም ከተበላሸ ወዲያውኑ ለቀበሌው የመሬት አስተዳደርና አጠቃቀም ኮሚቴ ያሳውቁ፡፡

Annex IV: Ethical Clearance

SUMMARY SHEET FOR THE ETHICAL CLEARANCE OF POSTGRADUATE STUDENT PROPOSALS FOR THESES/DISSERTATIONS

Please note: This suggested summary sheet IS NOT a replacement for the proposal formats as developed and suggested to candidates in each Department. Candidates should, in addition to this form, complete the proposals as suggested by the Departments in which they are enrolled.

The Higher Degrees Committees in Departments in the College of Human Sciences are reminded that they should make their students aware of the policy for research ethics of UNISA available at:
http://cm.unisa.ac.za/contents/departments/res_policies/docs/ResearchEthicsPolicy_apprvCounc_21Sept07.pdf

In judging postgraduate student proposals, Higher Degree Committees should comment on the methodological, technical and ethical soundness of the proposal and ask students to complete the following summary sheets. Difficult or special cases should be referred to the Ethics Subcommittee of the College of Human Sciences under the chairmanship of Prof Paul Gundani, the Acting Manager: Office for Graduate Studies and Research (Tel: 012 429 4085; E-mail: gundaph@unisa.ac.za).

A CANDIDATURE DETAILS

A1 FULL NAME OF CANDIDATE

Ermias Ashagrie Abebe

A2 ACADEMIC AND PROFESSIONAL QUALIFICATIONS

Doctor of Literature and Philosophy in the subject of Development Studies

A3 THESIS/DISSERTATION TITLE

An analysis of the impact of land registration and certification on sustainable use of
Farmlands in North-western Ethiopia: a case study

A4 PERSONAL PARTICULARS

(a) student number:	45450056
(b) current address:	P.O. Box 1446, Bahir Dar, ETHIOPIA
(c) e-mail:	ermiashaa@gmail.com
(d) telephone number(s)	+251918763732

A5 PROMOTER(S)/SUPERVISOR/(S)

(a) Initials & surname:	DA Kotze (Dr)
(b) Contact details:	Kotzeda@unisa.ac.za
(c) Department:	Development Studies
(a) Initials & surname:	
(b) Contact details:	
(c) Department:	

B PROPOSAL SUMMARY SHEET

B1 ABSTRACT OF THE PROPOSAL ***(Each department should suggest a word count for this)***

The Federal Democratic Republic of Ethiopia is a land-locked country in the horn of Africa, covering an area of 437,600 square miles; it is the second populous country in sub-Saharan Africa next to Nigeria (Murison 2004). According to the third Population and Housing Census results, the total population of the nation was around 74 million in the year 2007 with an annual growth rate of 2.6 percent (FDRE-PCC 2008). The country's economy is sustained primarily through agriculture, which contributes the largest share to the country's GDP, total export earnings and employment generation[1]. Subsistence farming engages over 80% of the total population contributing about half of GDP, but frequent droughts and poor agricultural systems have undermined this sector's productivity (MoFED 2005). Furthermore, land and environmental degradation, due to a lack of proper incentives for land related investment, is blamed for stagnant agricultural production. In this subsistence oriented peasant production system, land is the most extensively used resource to expand agricultural production even to ecologically fragile areas at the expense of future uses and generations (EEA 2002:26). Accordingly, ever-growing population coupled with tenure insecurity or the absence of clear property rights has resulted in the overexploitation of natural resources, especially farmlands, since the mid of the 20th century (Adal 2002; Gebreselassie 2006; EEA 2002;).

As a result, land use policies have been contested in both political and development debates for over four decades in Ethiopia because good land management is central to sustainable agrarian development. Despite the absence of a universal land use policy applicable to sustainable agrarian development, there is a global wave towards formalizing rural land holdings through registered land title (Fitzpatrick 2006; Heltberg 2002; Platteau 1996). Likewise, a large-scale rural land certification and registration scheme was launched in Ethiopia to enhance the perception of security of tenure among smallholder farmers for improving agricultural production and sustainable use of farmlands (Deininger, Ali & Alemu 2011). However, this new policy discourse could not ameliorate the ongoing debate. In view of this, this study is designed to analyze the impact of land registration and certification scheme on sustainable use of farmlands in North-Western Ethiopia, with a view to contribute to the theoretical debate on tenure security and to more realistic policy advocacy about sustainable use of farmlands in contemporary Ethiopia. Within the framework of qualitative research methodology, the case study approach will be used to observe and understand the relationship between land certification and sustainable use of farmlands in Densa Bahta and Debre Mawi rural villages ('Kebeles') of Amhara region. The study will also use participatory data gathering instruments such as focus group discussions (FGDs), in-depth interviews (IDIs) and observation, complemented by context analyses of relevant documents.

[1] Agriculture contributes for about 45 percent share of GDP, 80 percent of export earnings and 80 percent of employment generation.

D OBSERVATIONS BY THE HIGHER DEGREES COMMITTEE OF THE DEPARTMENT OF ....IN THE COLLEGE OF HUMAN SCIENCES

D1. Is the proposal of an acceptable standard?

YES ☑
NO, IT SHOULD BE REFERRED BACK TO THE CANDIDATE ☐

COMMENTS: Recommended

D2 Are all reasonable guarantees and safeguards for the ethics of this study covered?

YES ☑
NO, IT SHOULD BE REFERRED BACK TO THE RESEARCHER ☐

COMMENTS:

We have reviewed this completed Summary Sheet and are satisfied that it meets the methodological, technical and ethical standards as set in the Department of ....in the College of Human Sciences and that it is in compliance with the UNISA policy on research ethics.

Signed:	
Name:	Prof F C de Beer
Date:	24/02/2014